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As confidentially submitted to the Securities and Exchange Commission on March 28, 2018. This draft registration statement has not been publicly filed with the Securities and Exchange Commission and all information herein remains confidential.

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Confidential Draft Submission No. 1
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

MAGENTA THERAPEUTICS, INC.
(Exact name of Registrant as specified in its charter)

Delaware	2834	81-0724163
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

Magenta Therapeutics, Inc.
50 Hampshire Street, Cambridge,
Massachusetts
02139
(857) 242-0170
(Address, including zip code and telephone number, including area code, of registrant's principal executive offices)

Jason Gardner
President and Chief Executive Officer
Magenta Therapeutics, Inc.
50 Hampshire Street, Cambridge,
Massachusetts
02139
(857) 242-0170
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Mitchell S. Bloom, Esq. William D. Collins, Esq. Goodwin Procter LLP 100 Northern Avenue Boston, Massachusetts 02210 (617) 570-1000	Zoran Zdraveski, Esq. Chief Legal Officer and Secretary Magenta Therapeutics, Inc. 50 Hampshire Street, Cambridge, Massachusetts 02139 (857) 242-0170	Deanna Kirkpatrick, Esq. Marcel Fausten, Esq. Davis Polk & Wardwell LLP 450 Lexington Avenue New York, New York 10017 (212) 450-4000

Approximate date of commencement of proposed sale to public: As soon as practicable after this Registration Statement becomes effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box: ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering: ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering: ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering: ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒ (Do not check if a smaller reporting company)	Smaller reporting company	☐
		Emerging growth company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price(1)	Amount of Registration Fee(2)
Common Stock, par value $0.001 per share	$	$

(1) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act. Includes the offering price of any additional shares that the underwriters have the option to purchase.
(2) Calculated pursuant to Rule 457(o) under the Securities Act based on an estimate of the proposed maximum aggregate offering price.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

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The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated March 28, 2018

PRELIMINARY PROSPECTUS

Shares

magenta THERAPEUTICS

COMMON STOCK

We are selling shares of our common stock in this offering. This is our initial public offering and no public market currently exists for our shares. We anticipate that the initial public offering price of our common stock will be between $ and $ per share.

We have applied to list our common stock on The NASDAQ Global Market under the symbol "MGTA."

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012, as amended, and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings.

Investing in our common stock involves risks. See "Risk Factors" beginning on page 14.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

	Per share	Total
Public offering price	$	$
Underwriting discounts and commissions(1)	$	$
Proceeds to us before expenses	$	$

(1) We have agreed to reimburse the underwriters for certain FINRA-related expenses, in addition to underwriting discounts and commissions. See "Underwriting."

We have granted the underwriters an option for a period of 30 days from the date of this prospectus to purchase up to additional shares of our common stock at the public offering price, less the underwriting discount.

The underwriters expect to deliver the shares of common stock to purchasers on , 2018.

Joint Book-Running Managers

J.P. Morgan **Goldman Sachs & Co. LLC** **Cowen**

Co-Manager

Wedbush PacGrow

The date of this prospectus is , 2018

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We and the underwriters have not authorized anyone to provide any information other than that contained in this prospectus or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We and the underwriters are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

This prospectus contains forward-looking statements that are subject to a number of risks and uncertainties, many of which are beyond our control. See "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements."

Dealer Prospectus Delivery Obligation

Until , 2018 (the 25th day after the date of this prospectus), all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

For investors outside of the United States: We have not, and the underwriters have not, done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than the United States. Persons outside of the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside of the United States.

Trademarks and Trade Names

We own or have rights to various trademarks, service marks and trade names that we use in connection with the operation of our business. This prospectus may also contain trademarks, service marks and trade names of third parties, which are the property of their respective owners. Our use or display of third parties' trademarks, service marks, trade names or products in this prospectus is not intended to, and does not imply a relationship with, or endorsement or sponsorship by us. Solely for convenience, the trademarks, service marks and trade names referred to in this prospectus may appear without the ®, TM or SM symbols, but the omission of such references is not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the right of the applicable owner of these trademarks, service marks and trade names.

PROSPECTUS SUMMARY

Our Business

For more than 50 years, doctors and patients have had difficult conversations about bone marrow transplant: the procedure can save lives and cure patients, however the risks of toxicity and death often deter its use. At Magenta, we believe we can refocus that conversation on the cure and enable many more patients with devastating diseases such as severe autoimmune disorders, including multiple sclerosis; blood cancers, including leukemia; and genetic diseases such as sickle cell disease to benefit from advances in transplant medicine.

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients.

Transplant is a well-established and often curative medical procedure, and emerging data on stem cell gene therapy, which is bone marrow transplant using gene-modified stem cells, suggest the potential for meaningful benefit with this newer form of transplant. Bone marrow transplant and stem cell gene therapies use the same widely-adopted decades-old transplant process. As it exists today, bone marrow transplant is a large market opportunity, and improvements to the current approaches could extend bone marrow transplant to more patients. The ability to treat patients with a bone marrow transplant is limited by the challenge of obtaining sufficient cells to perform the procedure, the inherent morbidity and mortality of current methods used to prepare patients for transplant, and complications following transplant.

At Magenta, we believe we are uniquely positioned to overcome these challenges and to lead a new era in transplant medicine. Our portfolio of product candidates includes biologics, small molecules and a cell therapy designed to address deficiencies in existing approaches and extend the curative power of bone marrow transplant to more patients across many diseases. Currently, only a fraction of eligible patients with these diseases receive a transplant because the risks and challenges outweigh the potential for a cure. These include diseases where bone marrow transplant is a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and autoimmune diseases. Emerging clinical data suggest that bone marrow transplant may represent a breakthrough approach with curative potential for patients with severe autoimmune diseases. For example, recent results from multiple clinical trials show that patients with autoimmune diseases, including multiple sclerosis and scleroderma, can be cured with a transplant. However, based on our epidemiology analyses, currently only approximately 1 to 2% of eligible patients with multiple sclerosis or scleroderma in the United States, or U.S., and Europe receive a bone marrow transplant.

To address the major unmet medical needs in the existing bone marrow transplant process, we are developing a stem cell biology discovery platform and comprehensive portfolio of first-in-class therapeutics. Our programs will improve stem cell dose (expansion), stem cell collection (mobilization), patient preparation for transplant (conditioning), and potential post-transplant complications to address key limitations of the bone marrow transplant process to allow more patients to benefit. Within our expansion program, MGTA-456, our most advanced clinical product candidate, is a cell therapy that has achieved clinical proof of concept in 36 patients with blood cancers and is now being studied in patients with fatal inherited metabolic diseases. MGTA-456 is an expanded cord blood product, and has the potential to allow more patients to have a better chance for a successful stem cell transplant. Within our mobilization program, MGTA-145 is focused on enabling physicians to more easily harvest a greater number of blood stem cells, known as hematopoietic stem cells or HSCs, from patients and donors to improve patient outcomes. Our targeted transplant conditioning programs, which prepare the patient for transplant, are designed to selectively remove stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the decades-old radiation and chemotherapy-based approaches which are still the only available options. Our post-transplant complications program is designed to target the donor immune cells within the patient that cause Graft vs. Host Disease, or GvHD, which can be a fatal complication of transplant.

We intend to become a fully integrated discovery, development and commercial company in the field of transplant medicine. We believe that our product portfolio will offer significant commercial synergies. We are developing our products so that they can each be used individually or in combination with each other. As a result, our portfolio could be utilized in a manner tailored to the patient's disease, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.

Background on Bone Marrow Transplant

Bone marrow is the tissue inside bones where HSCs are located. HSCs produce all of the cells in the blood and immune systems, including: T cells and B cells to fight infections; red blood cells to carry oxygen and platelets to control bleeding. The bone marrow is highly active and gives rise to billions of new cells every day. However, abnormal functioning of the system can lead to serious and sometimes fatal blood and immune diseases. The aim of bone marrow transplant, also called HSC transplant or stem cell transplant, is to replace the diseased blood and immune cells with new stem cells that will produce new blood and immune cells, thereby effectively restoring the blood and immune systems to a healthy state.

Bone Marrow Transplant: The Process and Challenges

A bone marrow transplant procedure utilizes a number of integrated steps, which we explain below: stem cell sourcing and collection, patient conditioning and stem cell infusion and engraftment. All transplants are categorized as either autologous or allogeneic, depending on the source of cells for the transplant. In an autologous transplant, used for conditions such as multiple myeloma, non-Hodgkin lymphoma and autoimmune diseases, the patient's own stem cells are used. This is also the case for stem cell gene therapy. In an allogeneic transplant, used for conditions such as acute leukemia and genetic diseases, patients receive cells from a stem cell donor or umbilical cord blood.

Step 1: Stem Cell Sourcing and Collection

Once the patient and physician agree that bone marrow transplant is the best treatment option, first the source of stem cells must be identified and then the cells are collected. There are three sources of stem cells for transplant: extraction from the bone marrow, mobilization into the peripheral blood and harvesting from umbilical cord blood units. In the case of stem cell gene therapy, once the cells are collected from the patient, they are then modified to either insert a functioning gene or correct a defective gene.

Finding a matched donor and collecting enough stem cells are two significant challenges associated with the first step of bone marrow transplant. It is critical that physicians obtain enough stem cells for the transplant as higher cell doses are closely correlated to better patient outcomes. Although there are more than 25 million registered bone marrow donors worldwide, nearly half of all patients are unable to find a matched donor. Patients without a matched donor require the use of an alternative stem cell source such as unmatched donor or umbilical cord blood. Although more than 712,000 units are available in the worldwide cord blood inventory, the number of stem cells in a cord blood unit is low, and fewer than approximately 4% of these units contain enough stem cells for use in adults. Another option, stem cell harvesting, involves multiple invasive bone marrow harvests, or repeated injections, which are often associated with bone pain, nausea, headache and fatigue. It is difficult to predict whether mobilization will be successful, especially in heavily treated blood cancer patients.

Step 2: Conditioning

Once sufficient cells have been obtained, the patient is then conditioned for transplant using systemic, toxic chemotherapy and/or radiation. Depending on the disease and type of transplant, the conditioning treatment is intended to remove or deplete: existing stem cells in the bone marrow, immune cells (T cells and B cells) and/or cancer cells.

Bone marrow transplant conditioning is very burdensome and risky for both pediatric and adult patients. Conditioning treatments today are typically non-targeted and involve systemic, toxic chemotherapy and/or radiation. The current treatments damage the DNA and kill normal, healthy cells in the body, which can lead to severe infections, organ failure, infertility, secondary cancers and even death. Nearly all transplant patients experience complications as a result of current conditioning treatments, and conditioning toxicity is responsible for up to 35% of mortality following allogeneic transplants.

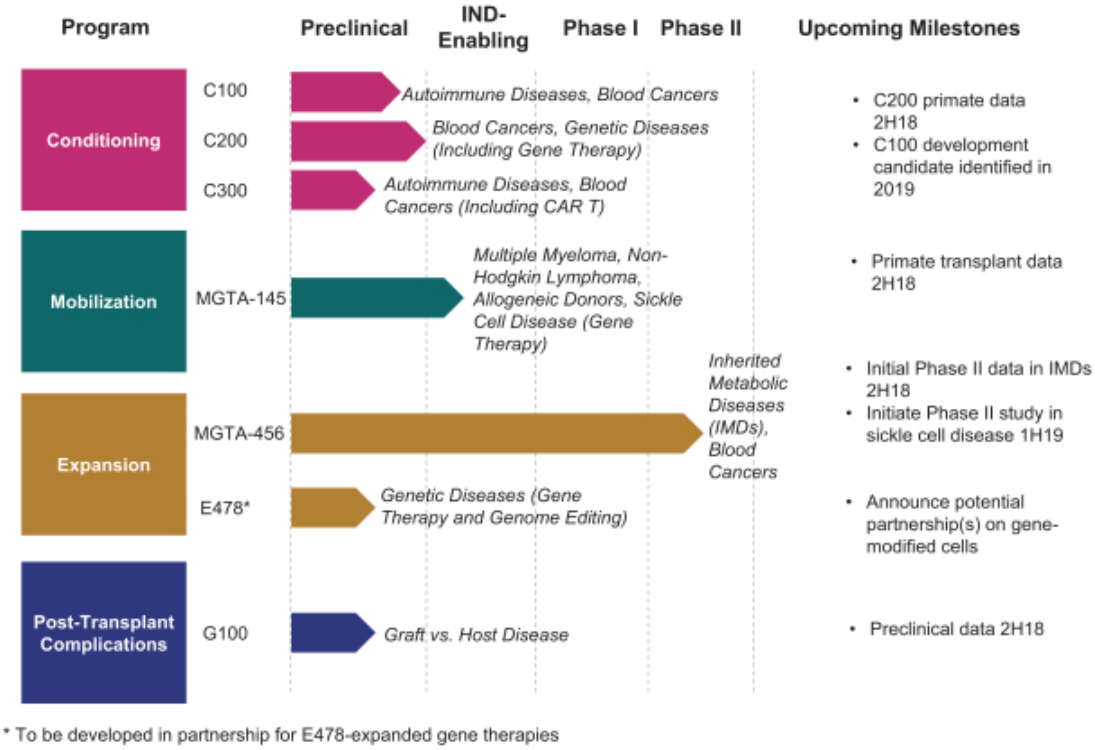
Step 3: Stem Cell Infusion and Engraftment

Once conditioning is complete, the stem cells are infused back into the patient via the bloodstream. The cells travel to and integrate into the bone marrow and begin to make new blood and immune cells, a process referred to as engraftment. Once the bone marrow has made enough blood cells —particularly white blood cells to fight infection—which typically takes several weeks, the patient can be discharged from the hospital.

Some of the common challenges include transplant rejection, delayed engraftment and GvHD. Delayed or failed engraftment can lead to prolonged hospitalization, the need for an additional transplant or death. After engraftment, GvHD can occur. This is when the donor T cells recognize the patient’s cells as foreign and attack the patient’s tissues and organs, particularly the skin, liver and gastrointestinal system. GvHD accounts for approximately 10% of deaths following allogeneic transplant.

Our Current Product Pipeline

We are developing a pipeline of small molecules; biologics, including antibody drug conjugates; and a cell therapy, which we believe can meaningfully improve and expand curative bone marrow transplant options for many more patients with autoimmune diseases, blood cancers and genetic diseases. Our portfolio of novel medicines for transplant has the potential to allow more patients with debilitating or life-threatening diseases to access a one-time, transformative bone marrow transplant with better outcomes, less risk of toxicity and mortality. We are developing our product candidates so that they can each be used individually or in combination with each other, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.



* To be developed in partnership for E478-expanded gene therapies

C100, C200, C300: targeted antibody-drug conjugates for conditioning

We are developing a suite of first-in-class antibody-drug conjugates, or ADCs, for transplant conditioning, a step in the transplant process that is still dominated by the use of systemic chemotherapy agents and radiation. We are seeking to replace these non-targeted toxic conditioning agents with our targeted ADCs. These drugs are designed for transplant and specifically deplete only the cell types required to be eliminated in order to perform a successful transplant. Certain ADCs are currently used to treat cancer by directing a toxin to specific cells. Our programs are adapting this clinically validated modality for conditioning patients for bone marrow transplant.

All of our conditioning programs share an ADC platform but differ in the targeted cell types. The C100 program targets both HSCs and immune cells, the C200 program targets only HSCs and the C300 program targets only immune cells. This is achieved by tuning the antibodies to specific cellular markers or receptors that are expressed on the particular cell types.

	C100	C200	C300
Lead target	CD45	CD117	Undisclosed
Cells removed	Stem and Immune Cells	Stem Cells	Immune Cells
Diseases	Autoimmune diseases Blood cancers	Genetic Diseases Genetic Diseases (Gene Therapy) Blood cancers	Autoimmune diseases Blood cancers Blood Cancers (CAR T)

Our most advanced conditioning program, C200, is designed to specifically deplete HSCs. Our lead target for C200 is CD117, also known as c-Kit, which is highly expressed on HSCs and leukemia cells, making it an ideal target for conditioning across a broad range of diseases. This includes blood cancers as well as well as hemoglobinopathies like sickle cell disease and beta-thalassemia, with potential applicability in both bone marrow transplant and stem cell gene therapy. We are currently studying ADCs targeting CD117 in non-human primates and expect to submit primate data for presentation at a medical meeting in late 2018. We intend to develop CD117-ADCs initially in patients with acute myelogenous leukemia or myelodysplastic syndrome. We are planning to explore CD117-ADCs in other diseases where patients undergo transplant with gene-modified cells, such as sickle cell disease.

The second conditioning program in our portfolio is C100, under which we are developing ADCs that specifically deplete host HSCs and immune cells. Within our C100 program, our lead target is CD45, an important cell surface molecule broadly expressed throughout the hematopoietic and immune systems. We are currently in the lead identification stage for this program and intend to identify a development candidate targeting CD45 in 2019. We plan to develop product candidates under our C100 program for use in patients with leukemias and lymphomas, followed by patients with autoimmune diseases such as multiple sclerosis and scleroderma.

Our third ADC-based conditioning program, C300, targets T cells, a type of immune cell. T cell depletion is currently performed with highly toxic, non-specific drugs, such as fludarabine and cyclophosphamide, which can lead to immune deficiency, infections and other complications including secondary autoimmune reactions. We are pursuing targets expressed on the surfaces of T cells with the goal of offering a safer and more optimized targeted conditioning approach through T cell depletion before CAR T therapy for blood cancers, prevention of stem cell rejection prior to allogeneic bone marrow transplant or achievement of immune system reset before autologous bone marrow transplant in autoimmune disease patients.

MGTA-145: CXCR2 agonist for stem cell mobilization

MGTA-145 is a first-in-class stem cell mobilization product candidate intended to achieve mobilization of high numbers of stem cells in a single day to replace granulocyte colony-stimulating factor, or G-CSF, the current standard of care. G-CSF mobilizes stem cells indirectly and comes with limitations that include a prolonged treatment period of up to one week of injections, lack of efficacy in some patients, and significant bone pain. MGTA-145 is a CXCR2 agonist protein that activates neutrophils to release proteases that cause the release of HSCs into the blood. This novel mechanism of action is complementary to that of plerixafor, another commonly used mobilization agent marketed by Sanofi. The combination of MGTA-145 and plerixafor has been shown to lead to a synergistic, robust and rapid stem cell mobilization in non-human primates. We have initiated IND-enabling studies of MGTA-145 in combination with plerixafor and expect to file an Investigational New Drug Application, or IND, with the U.S. Food and Drug Administration, or FDA, for this product candidate in 2019. We plan to develop MGTA-145 for mobilization first in patients with multiple myeloma and non-Hodgkin lymphoma, followed by healthy donors for allogeneic transplant. We plan to further investigate MGTA-145 in patient populations where G-CSF can exacerbate the disease such as autoimmune diseases, and patient populations where G-CSF is contra-indicated, such as sickle cell disease.

MGTA-456: aryl hydrocarbon receptor (AHR) antagonist-expanded stem cells

Our most advanced product candidate, MGTA-456, is a first-in-class proprietary allogeneic stem cell therapy that was developed based on the mechanisms that control stem cell growth. The goal of MGTA-456 is to extend the use of cord blood transplant to more patients by increasing the number of stem cells in a single cord blood unit to yield a higher stem cell dose. MGTA-456 has the potential to improve overall survival by allowing more patients to have access to better matched cord blood units, which is associated with better outcomes and lower rates of post-transplant complications.

MGTA-456 has achieved human proof-of-concept in Phase I/II trials in a total of 36 patients with blood cancers. Data from the trials showed that all 36 patients treated with MGTA-456 were successfully transplanted and the median time to transplant recovery was accelerated. We are encouraged by these promising results and looking at blood cancer and other conditions where we believe MGTA-456 may show transformative benefit for patients. These include inherited metabolic diseases, or IMDs, a group of diseases where cord blood transplant is a standard of care but up to 20% of patients with inherited metabolic diseases experience transplant failure, resulting in severe complications, including death. We have initiated a Phase II study of MGTA-456 in patients with inherited metabolic diseases and intend to explore other debilitating diseases where we believe MGTA-456 could bring transformative benefit to patients. We expect to report initial data from our Phase II study in late 2018. We also intend to initiate a Phase II study of MGTA-456 in patients with sickle cell disease in early 2019.

We added MGTA-456 to our portfolio through an April 2017 license agreement with Novartis International Pharmaceutical Ltd., or Novartis, granting us the sole worldwide rights for development and commercialization of cord blood-derived non-gene-edited/-modified HSCs expanded with certain AHR antagonists. See “Business Licenses and Collaborations” section.

E478: AHR antagonist for expansion of gene-modified stem cells

E478 is our novel and proprietary small molecule AHR antagonist that was developed to increase the number of gene-modified HSCs *ex vivo* for stem cell based-gene therapy. Gene therapy, or bone marrow transplant with gene-modified or genome-edited cells, is a promising treatment approach for several diseases. However, this approach is significantly limited by the inability to generate a sufficient dose of gene-modified HSCs that retain the ability to engraft in patients as well as the costs and complexity of manufacturing viral vectors for gene modification of cells. These constraints could limit the commercial viability of this approach. We have designed E478 to address these issues by expanding the number of gene-modified HSCs using AHR antagonism, the same clinically validated mechanism used to manufacture MGTA-456. We are developing E478 specifically to partner with gene therapy companies. E478 would be integrated into our potential partners’ cell-based products leading to a newly defined cell therapy. We believe that E478 could represent a key component for unlocking the full value of gene therapy by providing each patient with an optimal dose of gene modified cells for rapid and successful engraftment.

G100: ADC program for prevention of acute GvHD

We are developing G100 as a unique approach to preventing acute GvHD, a major complication and a leading cause of death in allogeneic transplant. GvHD occurs when alloreactive T cells in the donor stem cell graft recognize the patient as foreign and attack their tissues. Current treatments for acute GvHD prevention include the prophylactic use of non-specific immune suppressive agents. These treatments cause an increased risk of infection and poor immune function, and despite the use of these powerful immune suppressive agents, approximately 50 to 80% of allogeneic transplant patients experience acute GvHD, depending on the specific indication. Our G100 program is designed to selectively eliminate only the components of the donor graft that cause acute GvHD, specifically the alloreactive T cells. This ADC therapy is intended to be dosed *in vivo* at the

time of transplant. By specifically targeting the donor alloreactive T cells that arise shortly after transplant, this therapy should spare the remainder of the patient's immune system to allow immune recovery and protection from infections.

Our Team

We have assembled a group of world leaders and pioneers in the fields of stem cell biology, biotherapeutics and transplant medicine. With this team, we are converting recent scientific breakthroughs into a product engine for transplant therapies. Our Chief Executive Officer, Jason Gardner, brings more than 20 years of experience in stem cell science to Magenta. He served as Vice President and head of the R&D Satellite at GSK, where he also created and led the Regenerative Medicine Unit, established partnerships with The Harvard Stem Cell Institute and the Telethon Institute for Gene Therapy, from which the first stem cell gene therapy (Strimvelis™) was approved. Michael Cooke, our Chief Scientific Officer, has more than 20 years of experience in biotechnology and pharmaceutical companies, where he has been responsible for the discovery and development of a portfolio of products to treat autoimmune disease and immune diseases and improve hematopoietic stem cell transplant, including our most advanced program, MGTA-456. Dr. Cooke is an author on more than 60 peer-reviewed publications. Our Chief Medical Officer, John Davis, joined Magenta from Pfizer, where he was Senior Vice President and Head of Early Clinical Development. Prior to Pfizer, Dr. Davis served as Vice President and Global Therapeutic Area Head of Immunology at Baxalta and as Senior Group Director and Head of the Inflammation and Cardiovascular/Metabolism Group in the Early Clinical Development Group at Genentech. Dr. Davis spent nearly 10 years on faculty at The University of California San Francisco leading clinical research in autoimmune diseases, and he is Professor of Clinical Medicine. Christina Isacson, our Chief Business Officer, has more than 13 years of experience in senior business development in biotechnology companies and company creation. Dr. Isacson is responsible for our business and corporate development, and the establishment and management of partnerships. Zoran Zdraveski has served as our Chief Legal Officer since April 2017 and is responsible for all aspects of our legal, intellectual property, and compliance functions. Dr. Zdraveski has more than 16 years of experience in the legal field in the biopharmaceutical industry. Our scientific advisory board is chaired by David Scadden, M.D., Gerald and Darlene Jordan Professor of Medicine at Harvard University and one of the world's foremost experts in stem cell biology. The other members of our world-class scientific advisory board include John DiPersio, M.D., Ph.D., of Washington University School of Medicine; Robert Negrin, M.D., of Stanford University; Alan Tyndall, M.D., formerly of University of Basel; and Luigi Naldini, M.D., Ph.D., of San Raffaele-Telethon Institute for Gene Therapy.

Our Core Values

At Magenta, we are working to revolutionize bone marrow transplants by applying equal parts courage, commitment, and excellence:

- Courage to make a difference for patients, their families, and their healthcare providers
- Commitment to patients, our partners, and one another
- Excellence in everything we do

Our Strategy

Our mission and our culture are centered around the goal of enabling more patients with severe or life-threatening diseases to have access to the transformative benefit of a bone marrow transplant. We intend to provide physicians with a tailored, multi-product treatment regimen based on the disease setting and the individual needs of each patient. Our strategic priorities are as follows:

- Bring the curative power of bone marrow transplant to all patients who can benefit by advancing an integrated product portfolio.
- Build on our deep expertise in stem cell biology to lead a new era in transplant medicine.

- Create a fully integrated patient-focused biotechnology company.
- Commercialize our therapeutics to bring tailored transplant solutions to physicians and patients.
- Leverage our most advanced product candidate, MGTA-456, as a clinical catalyst and commercial beachhead for our portfolio.
- Continue to integrate our innovative collaboration with Be The Match with our science, medicine and business approaches.
- Strategically collaborate to realize the full potential of our portfolio.

Risks Associated with Our Business

Our ability to implement our business strategy is subject to numerous risks that you should be aware of before making an investment decision. These risks are described more fully in the section entitled "Risk Factors" in this prospectus. These risks include, among others:

- we are a clinical-stage company with a limited operating history, have incurred significant losses since our inception, and anticipate that we will continue to incur significant losses for the foreseeable future;
- even if this offering is successful, we will need to raise additional funding before we can expect to generate any revenues from product sales;
- if we are unable to obtain regulatory approval for MGTA-456 or any other product candidates that we may identify or develop, our business will be substantially harmed;
- we are heavily dependent upon the success of MGTA-456, which has just completed a Phase I/II clinical trial and is currently in a separate Phase II clinical trial, and none of our other product candidates are in clinical trials;
- results of earlier studies may not be predictive of future clinical trial results, and we may fail to establish an adequate safety or efficacy profile to conduct advanced clinical trials or obtain regulatory approval for MGTA-456 or any other product candidates that we may pursue;
- if serious adverse events, undesirable side effects, or unexpected characteristics are identified during the development of any of our product candidates, we may need to delay, abandon or limit our further clinical development of those product candidates;
- if we are not able to identify a safe and effective dose for any of our ADCs, we may need to delay, abandon or limit our development of any potential product candidates;
- if we are unable to successfully develop our current programs into a comprehensive portfolio of product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our current and future product candidates;
- we are developing E478 specifically to partner with gene therapy companies, and if we are unable to find willing collaborators, this may adversely affect the development of E478 and our business;
- we expect to continue to rely on third parties to manufacture our clinical product supplies, and we intend to rely on third parties to produce and process our product candidates, if approved;
- we are highly dependent on intellectual property licensed from third parties and termination of any of these licenses could result in the loss of significant rights, which would harm our business;
- if we are unable to obtain and maintain sufficient intellectual property protection for MGTA-456, our technologies, or any future product candidates, we may not be able to compete effectively in our markets; and
- our future success depends in part upon our ability to retain our key employees, consultants and advisors and to attract, retain and motivate other qualified personnel.

Corporate History and Information

We were incorporated under the laws of the State of Delaware on June 17, 2015 under the name HSCTCo Therapeutics, Inc. and in February 16, 2016 we changed our name to Magenta Therapeutics, Inc. Our principal executive office is located at 50 Hampshire Street, Cambridge, Massachusetts 02139, and our telephone number is (857) 242-0170. Our website address is *www.magentatx.com*. We do not incorporate the information on or accessible through our website into this prospectus, and you should not consider any information on, or that can be accessed through, our website as part of this prospectus.

Implications of Being an Emerging Growth Company

We qualify as an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended, or the JOBS Act. As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include:

- two years of audited financial statements in addition to any required unaudited interim financial statements with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- reduced disclosure about our executive compensation arrangements;
- no non-binding advisory votes on executive compensation or golden parachute arrangements; and
- exemption from the auditor attestation requirement in the assessment of our internal control over financial reporting.

We may take advantage of these exemptions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company on the date that is the earliest of (i) the last day of the fiscal year in which we have total annual gross revenues of $1.07 billion or more; (ii) the last day of our fiscal year following the fifth anniversary of the date of the completion of this offering; (iii) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years; or (iv) the last day of the fiscal year in which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission, or SEC, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th. We may choose to take advantage of some but not all of these exemptions. We have taken advantage of reduced reporting requirements in this prospectus. Accordingly, the information contained herein may be different from the information you receive from other public companies in which you hold stock. We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an emerging growth company, we may rely on certain of these exemptions, including without limitation, providing an auditor's attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act.

THE OFFERING

Common stock offered by us	shares
Common stock to be outstanding after this offering	shares
Underwriters' option	We have granted the underwriters an option to purchase a maximum of additional shares of common stock from us. The underwriters can exercise this option at any time within 30 days from the date of this prospectus.
Use of Proceeds	We estimate that we will receive net proceeds from the sale of shares of our common stock in this offering of approximately $ million, or $ million if the underwriters fully exercise their option to purchase additional shares, assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds from this offering and our existing cash and cash equivalents to fund our conditioning programs and product candidates, the development of MGTA-456, the development of MGTA-145, our mobilization product candidate and the remainder, if any, to fund new and ongoing research and development activities, our new product engine, working capital and other general corporate purposes. See "Use of Proceeds" for additional information.
Risk Factors	You should carefully read the "Risk Factors" section of this prospectus beginning on page 14 and other information included in this prospectus for a discussion of factors that you should consider before deciding to invest in our common stock.
The NASDAQ Global Market symbol	"MGTA"

The number of shares of common stock to be outstanding after this offering is based on 60,673,380 shares of common stock outstanding as of February 28, 2018, which includes 4,944,775 shares of unvested restricted stock subject to repurchase by us, after giving effect to the automatic conversion of all outstanding shares of our preferred stock and excludes:

- 3,583,000 shares of common stock issuable upon the exercise of stock options outstanding as of February 28, 2018 under our 2016 Stock Option and Grant Plan, or the 2016 Plan, at a weighted average exercise price of $2.48 per share;
- 2,594,587 shares of common stock reserved and available for future issuance under the 2016 Plan, as of February 28, 2018; and
- shares of our common stock reserved for future issuance under our 2018 Stock Option and Incentive Plan, or the 2018 Plan, which will become effective upon the completion of this offering, as well as any future increases in the number of shares of common stock reserved for future increases in the number of shares of common stock reserved for future issuances under our 2018 Plan.

Except as otherwise indicated, all information in this prospectus assumes or gives effect to:

- the conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of shares of our common stock upon the completion of this offering;

- no exercise of the outstanding options described above;
- no exercise by the underwriters of their option to purchase up to an additional shares of our common stock in this offering;
- A one-for- reverse split of our common stock, which will become effective prior to the completion of this offering; and
- the filing of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws, which will occur immediately prior to the completion of this offering.

SUMMARY FINANCIAL DATA

You should read the following summary financial data together with our financial statements and the related notes appearing at the end of this prospectus and the "Selected Financial Data" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" sections of this prospectus. We have derived the statement of operations data for the years ended December 31, 2016 and 2017 and the balance sheet data as of December 31, 2017 from our audited financial statements appearing at the end of this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future.

	Year Ended December 31,	
	2016	2017
	(in thousands, except share and per share data)	
Statement of Operations Data:		
Revenue	$ —	$ —
Operating expenses:		
Research and development	5,782	27,899
General and administrative	3,486	7,828
Total operating expenses	9,268	35,727
Loss from operations	(9,268)	(35,727)
Other income (expense):		
Interest expense	(163)	—
Interest and other income, net	—	236
Total other income (expense), net	(163)	236
Net loss	$ (9,431)	$ (35,491)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634
Net loss attributable to common stockholders	$ (9,735)	$ (35,507)
Net loss per share attributable to common stockholders—basic and diluted	$ (25.21)	$ (7.40)
Weighted average common shares outstanding—basic and diluted	386,083	4,798,213
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)		$ (0.80)
Pro forma weighted average common shares outstanding—basic and diluted (unaudited)		44,294,374

	At December 31, 2017		
	Actual	Pro Forma(2)	Pro Forma As Adjusted(3)
		(in thousands)	
Balance Sheet Data:			
Cash and cash equivalents	$ 51,402	$ 51,402	
Working capital(1)	48,361	48,361	
Total assets	54,463	54,463	
Redeemable convertible preferred stock	92,439	—	
Total stockholders' equity (deficit)	(42,118)	50,321	

(1) We define working capital as current assets less current liabilities.

(2) The pro forma balance sheet data give effect to the automatic conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of 49,178,527 shares of our common stock upon the completion of this offering.

(3) The pro forma as adjusted balance sheet data give further effect to our issuance and sale of shares of our common stock offered in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' equity by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' equity by $ million, assuming no change in the assumed initial public offering price per share and after deducting estimated underwriting discounts and commissions.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, as well as the other information in this prospectus, including our financial statements and the related notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations," before deciding whether to invest in our common stock. The occurrence of any of the events or developments described below could harm our business, financial condition, results of operations and growth prospects. In such an event, the market price of our common stock could decline and you may lose all or part of your investment. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations.

Risks Related to Our Financial Position and Need for Additional Capital

We have incurred net losses in every year since our inception and anticipate that we will continue to incur net losses in the future.

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients, and have a limited operating history. Investment in biopharmaceutical product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate adequate effect or an acceptable safety profile, gain regulatory approval and become commercially viable. We have no products approved for commercial sale and have not generated any revenue from product sales to date, and we continue to incur significant research and development and other expenses related to our ongoing operations. As a result, we are not profitable and have incurred losses in each period since our inception in June 2015. For the years ended December 31, 2016 and 2017, we reported a net loss of $9.4 million and $35.5 million, respectively. As of December 31, 2017, we had an accumulated deficit of $45.2 million. We expect to continue to incur significant losses for the foreseeable future, and we expect these losses to increase as we continue our research and development of, and seek regulatory approvals for, our product candidates.

Even if we succeed in commercializing one or more of our product candidates, we will continue to incur substantial research and development and other expenditures to develop and market additional product candidates. We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenue. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

We will require additional capital to fund our operations and if we fail to obtain necessary financing, we will not be able to complete the development and commercialization of our product candidates.

Our operations have consumed substantial amounts of cash since inception. We expect to continue to spend substantial amounts to conduct further research and development and preclinical testing and clinical trials of our product candidates, to seek regulatory approvals for our product candidates and to launch and commercialize any product candidates for which we receive regulatory approval, including potentially building our own commercial organization to address the United States, the European Union and certain other markets. As of December 31, 2017, we had approximately $51.4 million in cash and cash equivalents. Based on our current operating plan, we believe that the net proceeds from this offering, together with existing cash and cash equivalents, will be sufficient to fund our anticipated level of operations through at least . However, our future capital requirements and the period for which our existing resources will support our operations may vary significantly from what we expect. Our monthly spending levels will vary based on new and ongoing development and corporate activities. Because the length of time and activities associated with successful development of our

product candidates is highly uncertain, we are unable to estimate the actual funds we will require for development and any approved marketing and commercialization activities. Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the initiation, progress, timing, costs and results of preclinical studies and clinical trials for our product candidates;
- the clinical development plans we establish for these product candidates;
- the number and characteristics of product candidates that we develop or may in-license;
- the terms of any collaboration agreements we may choose to conclude;
- the outcome, timing and cost of meeting regulatory requirements established by the FDA, the European Medical Agency, or EMA, and other comparable foreign regulatory authorities;
- the cost of filing, prosecuting, defending and enforcing our patent claims and other intellectual property rights;
- the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us or our product candidates;
- the effect of competing technological and market developments;
- the cost and timing of completion of commercial-scale outsourced manufacturing activities; and
- the cost of establishing sales, marketing and distribution capabilities for any product candidates for which we may receive regulatory approval in regions where we choose to commercialize our products on our own.

We cannot be certain that additional funding will be available on acceptable terms, or at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of one or more of our product candidates or one or more of our other research and development initiatives. We also could be required to seek collaborators for one or more of our current or future product candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available or relinquish or license on unfavorable terms our rights to technologies or product candidates that we otherwise would seek to develop or commercialize ourselves.

Any of the above events could significantly harm our business, prospects, financial condition and results of operations and cause the price of our common stock to decline.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates.

We may seek additional capital through a combination of public and private equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. The incurrence of indebtedness would result in increased fixed payment obligations and could involve certain restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. If we raise additional funds through strategic partnerships and alliances and licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies or product candidates, or grant licenses on terms unfavorable to us.

Our company has a limited operating history and no history of commercializing pharmaceutical products, which may make it difficult to evaluate the prospects for our future viability.

We are an early-stage company. We were founded and commenced operations in June 2015. Our operations to date have been limited to organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying potential product candidates, and undertaking preclinical studies, and in the case of MGTA-456, clinical trials. Aside from MGTA-456, all of our research programs and product candidates are still in the preclinical or research stage of development, and their risk of failure is high. We have not yet demonstrated an ability to initiate or successfully complete any clinical trials (other than for MGTA-456), including large-scale, pivotal clinical trials, obtain marketing approvals, manufacture a commercial-scale medicine, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. Typically, it takes about 10 to 15 years to develop a new medicine from the time it is discovered to when it is available for treating patients. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history.

In addition, as a new business, we may encounter unforeseen expenses, difficulties, complications, delays, and other known and unknown factors. We will need to transition from a company with a research focus to a company capable of supporting commercial activities. We may not be successful in such a transition.

We have never generated revenue from product sales and may never be profitable.

Our ability to generate revenue from product sales and achieve profitability depends on our ability, alone or with collaborative partners, to successfully complete the development of, and obtain the regulatory approvals necessary to commercialize product candidates we may identify for development. We may not generate revenues from product sales for the next several years, if ever. Our ability to generate future revenues from product sales depends heavily on our, or our collaborators', ability to successfully:

- identify product candidates and complete research and preclinical and clinical development of any product candidates we may identify;
- seek and obtain regulatory and marketing approvals for any of our product candidates for which we complete clinical trials;
- launch and commercialize any of our product candidates for which we obtain regulatory and marketing approval by establishing a sales force, marketing, and distribution infrastructure or, alternatively, collaborating with a commercialization partner;
- qualify for adequate coverage and reimbursement by government and third-party payors for any of our product candidates for which we obtain regulatory and marketing approval;
- develop, maintain, and enhance a sustainable, scalable, reproducible, and transferable manufacturing process for the product candidates we may develop;
- establish and maintain supply and manufacturing relationships with third parties that can provide adequate, in both amount and quality, products and services to support clinical development and the market demand for any of our product candidates for which we obtain regulatory and marketing approval;
- obtain market acceptance of any product candidates we may develop as viable treatment options;
- address competing technological and market developments;
- implement internal systems and infrastructure, as needed;
- negotiate favorable terms in any collaboration, licensing, or other arrangements into which we may enter and perform our obligations in such collaborations;
- maintain, protect, and expand our portfolio of intellectual property rights, including patents, trade secrets, and know-how;
- avoid and defend against third-party interference or infringement claims; and
- attract, hire, and retain qualified personnel.

Even if one or more of the product candidates we may develop is approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate. Our expenses could increase beyond expectations if we are required by the FDA, the EMA, or other regulatory authorities to perform clinical and other studies in addition to those that we currently anticipate. Even if we are able to generate revenues from the sale of any approved products, we may not become profitable and may need to obtain additional funding to continue operations.

Our auditors have expressed substantial doubt about our ability to continue as a going concern, which may hinder our ability to obtain further financing.

Our recurring losses from operations raise substantial doubt about our ability to continue as a going concern. As a result, our independent registered public accounting firm included an explanatory paragraph in its report on our financial statements for the year ended December 31, 2017 with respect to this uncertainty. Our ability to continue as a going concern will require us to obtain additional funding. We believe that the net proceeds from this offering and our existing cash and cash equivalents will be sufficient to fund our operating expenses and capital expenditure requirements through . We have based these estimates, however, on assumptions that may prove to be wrong, and we could spend our available financial resources much faster than we currently expect and need to raise additional funds sooner than we anticipate. If we are unable to raise capital when needed or on acceptable terms, we would be forced to delay, reduce or eliminate our research and development programs and commercialization efforts.

Comprehensive tax reform legislation could adversely affect our business and financial condition.

The U.S. government has recently enacted comprehensive tax legislation that includes significant changes to the taxation of business entities. These changes include, among others, a permanent reduction to the corporate income tax rate. Notwithstanding the reduction in the corporate income tax rate, the overall impact of this tax reform is uncertain, and our business and financial condition could be adversely affected. This prospectus does not discuss any such tax legislation or the manner in which it might affect purchasers of our common stock. We urge our stockholders to consult with their legal and tax advisors with respect to any such legislation and the potential tax consequences of investing in our common stock.

Our insurance policies may be inadequate and potentially expose us to unrecoverable risks.

We have limited director and officer insurance and commercial insurance policies. Any significant insurance claims would have a material adverse effect on our business, financial condition and results of operations. Insurance availability, coverage terms and pricing continue to vary with market conditions. We endeavor to obtain appropriate insurance coverage for insurable risks that we identify, however, we may fail to correctly anticipate or quantify insurable risks, we may not be able to obtain appropriate insurance coverage, and insurers may not respond as we intend to cover insurable events that may occur. We have observed rapidly changing conditions in the insurance markets relating to nearly all areas of traditional corporate insurance. Such conditions have resulted in higher premium costs, higher policy deductibles, and lower coverage limits. For some risks, we may not have or maintain insurance coverage because of cost or availability.

Risks Related to Product Development and Regulatory Approval

We are very early in our development efforts. All but one of our product candidates, MGTA-456, are still in preclinical development. If we are unable to advance our product candidates to obtain regulatory approval and ultimately commercialize our product candidates, or experience significant delays in doing so, our business will be materially harmed.

We are very early in our development efforts and all but one of our product candidates, MGTA-456, are still in preclinical development. We have only recently completed initial preclinical studies for MGTA-145. Our ability to generate product revenue, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of our product candidates, which may never occur. We currently generate no revenue from sales of any product and we may never be able to develop or commercialize a marketable product.

Each of our programs and product candidates will require additional preclinical and clinical development, regulatory approval in multiple jurisdictions, obtaining manufacturing supply, capacity and expertise, building of a commercial organization, substantial investment and significant marketing efforts before we generate any revenue from product sales. Our product candidates must be authorized for marketing by the FDA, or certain other foreign regulatory agencies, such as the EMA, before we may commercialize our product candidates.

The success of our product candidates will depend on several factors, including the following:

- successful completion of preclinical studies and successful enrollment and completion of clinical trials, including toxicology studies, biodistribution studies and minimally efficacious dose studies in animals, where applicable, under the FDA's cGCPs, and the FDA's current Good Laboratory Practices, or cGLPs;
- effective Investigational New Drug applications, or INDs, or Clinical Trial Authorisations, or CTAs, that allow commencement of our planned clinical trials or future clinical trials for our product candidates;
- positive results from our future clinical programs that support a finding of safety and effectiveness and an acceptable risk-benefit profile of our product candidates in the intended populations;
- receipt of regulatory approvals from applicable regulatory authorities;
- establishment of arrangements with third-party manufacturers for clinical supply and, where applicable, commercial manufacturing capabilities;
- successful development of our internal manufacturing processes or transfer to larger-scale facilities operated by either a contract manufacturing organization, or CMO, or by us;
- establishment and maintenance of patent and trade secret protection or regulatory exclusivity for our product candidates;
- commercial launch of our product candidates, if and when approved, whether alone or in collaboration with others;
- acceptance of our product candidates, if and when approved, by patients, the medical community and third-party payors;
- effective competition with other therapies;
- establishment and maintenance of healthcare coverage and adequate reimbursement;
- enforcement and defense of intellectual property rights and claims; and
- maintenance of a continued acceptable safety profile of our product candidates following approval.

If we do not succeed in one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize our product candidates, which would materially harm our business. If we do not receive regulatory approvals for our product candidates, we may not be able to continue our operations.

Our planned clinical trials or those of our collaborators may reveal significant adverse events not seen in our preclinical studies and may result in a safety profile that could inhibit regulatory approval or market acceptance of any of our product candidates.

Before obtaining regulatory approvals for the commercial sale of our product candidates we must demonstrate through lengthy, complex and expensive preclinical testing and clinical trials that our product candidates are both safe and effective for use in each target indication. Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. There is typically an extremely high rate of attrition from the failure of product candidates proceeding through clinical trials. For example, although we have not observed any product-related adverse effects in our existing Phase II clinical trial of MGTA-456, this does not ensure that we will not see more serious adverse effects in the future. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through preclinical studies and initial clinical

trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most product candidates that commence clinical trials are never approved as products.

If significant adverse events or other side effects are observed in any of our current or future clinical trials, we may have difficulty recruiting patients to the clinical trial, patients may drop out of our trial, or we may be required to abandon the trial or our development efforts of that product candidate altogether. We, the FDA or other applicable regulatory authorities, or an institutional review board, or IRB, may suspend clinical trials of a product candidate at any time for various reasons, including a belief that subjects in such trials are being exposed to unacceptable health risks or adverse side effects. Some potential therapeutics developed in the biotechnology industry that initially showed therapeutic promise in early-stage studies have later been found to cause side effects that prevented their further development. Even if the side effects do not preclude the drug from obtaining or maintaining marketing approval, undesirable side effects may inhibit market acceptance of the approved product due to its tolerability versus other therapies. Any of these developments could materially harm our business, financial condition and prospects.

Clinical development involves a lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of any product candidates.

With the exception of MGTA-456, our other product candidates are still in the preclinical development stage, and their risk of failure is high. It is impossible to predict when or if any of our programs will prove effective and safe in humans or will receive regulatory approval. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical development and then conduct extensive clinical trials to demonstrate the safety and efficacy of any of our future product candidates in humans. Preclinical and clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. We may be unable to establish clinical endpoints that applicable regulatory authorities would consider clinically meaningful, and a clinical trial can fail at any stage of testing. The outcome of preclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products.

Successful completion of clinical trials is a prerequisite to submitting a new drug application, or NDA, or a biologics license application, or BLA, to the FDA, a Marketing Authorization Application, or MAA, to the EMA and similar approval filings to comparable foreign regulatory authorities, for each product candidate and, consequently, the ultimate approval and commercial marketing of any product candidates. We do not know whether any of our clinical trials will begin or be completed on schedule, if at all.

We may experience delays in completing our preclinical studies and initiating or completing clinical trials. We also may experience numerous unforeseen events during, or as a result of, any future clinical trials that we could conduct that could delay or prevent our ability to receive marketing approval or commercialize our product candidates, including:

- regulators, IRBs, or ethics committees may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable terms with prospective trial sites and prospective contract research organizations, or CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- clinical trials of any product candidates may fail to show safety or efficacy, produce negative or inconclusive results and we may decide, or regulators may require us, to conduct additional preclinical studies or clinical trials or we may decide to abandon product development programs;

- the number of patients required for clinical trials of any product candidates may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials or fail to return for post-treatment follow-up at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all, or may deviate from the clinical trial protocol or drop out of the trial, which may require that we add new clinical trial sites or investigators;
- we may elect to, or regulators, IRBs or ethics committees may require that we or our investigators, suspend or terminate clinical research or trials for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of preclinical studies and clinical trials of any product candidates may be greater than we anticipate;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate; and
- our product candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators, IRBs or ethics committees to suspend or terminate the trials, or reports may arise from preclinical or clinical testing of other bone marrow transplant and cell-based therapies that raise safety or efficacy concerns about our product candidates.

We could also encounter delays if a clinical trial is suspended or terminated by us, the IRBs of the institutions in which such trials are being conducted, the Data Safety Monitoring Board, or DSMB, for such trial or FDA or other regulatory authorities. Such authorities may impose such a suspension or termination due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product or treatment, failure to establish or achieve clinically meaningful trial endpoints, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. For example, in December 2015, prior to our license of MGTA-456 from Novartis International Pharmaceutical Ltd., or Novartis, the FDA imposed a partial clinical hold on the cryopreserved part of the protocol covered by the IND application for MGTA-456 until Novartis demonstrated comparability between the fresh and cryopreserved product. This partial clinical hold was later removed by the FDA in May 2016 when Novartis presented a satisfactory comparability study. We cannot guarantee that we will not be subject to further holds by the FDA or other regulatory authorities in the future. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates. Further, the FDA or other regulatory authorities may disagree with our clinical trial design and our interpretation of data from clinical trials, or may change the requirements for approval even after they have reviewed and commented on the design for our clinical trials.

Our product development costs will increase if we experience delays in clinical testing or marketing approvals. We do not know whether any of our preclinical studies or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant preclinical or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates and may allow our competitors to bring products to market before we do, potentially impairing our ability to successfully commercialize our product candidates and harming our business and results of operations. Any delays in our preclinical or future clinical development programs may harm our business, financial condition and prospects significantly.

We have no experience as a company in obtaining regulatory approval for a drug.

As a company, we have never obtained regulatory approval for, or commercialized, a drug. It is possible that the FDA may refuse to accept any or all future new drug applications, or NDAs, or BLAs for substantive review or may conclude after review of our data that our application is insufficient to obtain regulatory approval for any current or future product candidates. If the FDA does not approve any future NDAs or BLAs, it may require that we conduct additional costly clinical, preclinical or manufacturing validation studies before it will reconsider our applications. Depending on the extent of these or any other FDA-required studies, approval of any NDA or BLA or other application that we submit may be significantly delayed, possibly for several years, or may require us to expend more resources than we have available. Any failure or delay in obtaining regulatory approvals would prevent us from commercializing MGTA-456 or any other product candidate, generating revenues and achieving and sustaining profitability. It is also possible that additional studies, if performed and completed, may not be considered sufficient by the FDA to approve any NDA or other application that we submit. If any of these outcomes occur, we may be forced to abandon the development of our product candidates, which would materially adversely affect our business and could potentially cause us to cease operations. We face similar risks for our applications in foreign jurisdictions.

If serious adverse events, undesirable side effects, or unexpected characteristics are identified during the development of any product candidates we may develop, we may need to abandon or limit our further clinical development of those product candidates.

It is impossible to predict when or if any product candidates we may develop will prove safe in humans. If any product candidates we develop are associated with serious adverse events, or undesirable side effects, or have characteristics that are unexpected, we may need to abandon their development or limit development to certain uses or subpopulations in which the serious adverse events, undesirable side effects or other characteristics are less prevalent, less severe, or more acceptable from a risk-benefit perspective, any of which would have a material adverse effect on our business, financial condition, results of operations, and prospects. It is possible that product candidates that initially showed promise in early stage testing will later have been found to cause side effects that prevent further clinical development of the product candidates.

If we are not able to identify a safe and effective dose for any of our ADCs, we may need to delay, abandon or limit our development of any potential product candidates.

ADCs utilize toxins to kill cells, and we may not be able to identify a safe and effective dose for some of our potential product candidates. ADCs, including those that have received marketing approval, have dose-dependent safety findings that can include liver toxicity, depending on the target of the ADC and the drug used in the conjugate. In addition, ADCs may have other adverse side effects including fatalities. In our ongoing proof of mechanism non-human primate study, with a probe CD117-ADC designed to deplete HSCs, we observed some instances of transient elevation of liver enzymes that were dose- and toxin-dependent. Out of the twelve non-human primates treated with the probe CD117-ADC, one treated with the highest dose was euthanized subsequent to receiving scheduled pain medication before a planned bone marrow aspirate. In addition, one non-human primate in each of the two highest dose groups showed the anticipated signs of bone marrow failure resulting from HSC depletion and were euthanized prior to the end of the study. Although this ongoing study may potentially validate the non-human primate as a suitable model for efficacy and tolerability, if we are not able to ultimately show that optimized C200 program ADCs can deplete HSCs at a safe and effective dose, we may need to delay, abandon or limit the development.

Even if we obtain regulatory approval of any of our product candidates, the approved products may be subject to post-approval studies and will remain subject to ongoing regulatory requirements. If we fail to comply, or if concerns are identified in subsequent studies, our approval could be withdrawn and our product sales could be suspended.

If we are successful at obtaining regulatory approval for MGTA-456 or any of our other product candidates, regulatory agencies in the United States and other countries where a product will be sold may require extensive

additional clinical trials or post-approval clinical trials that are expensive and time-consuming to conduct. In particular, therapeutic products administered for the treatment of certain inherited metabolic diseases, such as Hurler's syndrome and leukodystrophies, are likely to require extensive follow-up studies and close monitoring of patients after regulatory approval has been granted, for any signs of adverse effects that occur over a long period of time. These studies may be expensive and time-consuming to conduct and may reveal side effects or other harmful effects in patients that use our therapeutic products after they are on the market, which may result in the limitation or withdrawal of our drugs from the market. Alternatively, we may not be able to conduct such additional trials, which might force us to abandon our efforts to develop or commercialize certain product candidates. Even if post-approval studies are not requested or required, after our products are approved and on the market, there might be safety issues that emerge over time that require a change in product labeling or that require withdrawal of the product from the market, which would cause our revenue to decline.

Additionally, any products that we may successfully develop will be subject to ongoing regulatory requirements after they are approved. These requirements will govern the manufacturing, packaging, marketing, distribution, and use of our products. If we fail to comply with such regulatory requirements, approval for our products may be withdrawn, and product sales may be suspended. We may not be able to regain compliance, or we may only be able to regain compliance after a lengthy delay, significant expense, lost revenues and damage to our reputation.

Because we are developing product candidates for the treatment of diseases in which there is little clinical experience using new technologies, there is increased risk that the FDA, the EMA, or other regulatory authorities may not consider the endpoints of our clinical trials to provide clinically meaningful results and that these results may be difficult to analyze.

During the regulatory review process, we will need to identify success criteria and endpoints such that the FDA, the EMA, or other regulatory authorities will be able to determine the clinical efficacy and safety profile of any product candidates we may develop. As we are initially seeking to identify and develop product candidates to treat diseases in which there is little clinical experience using new technologies, there is heightened risk that the FDA, the EMA, or other regulatory authorities may not consider the clinical trial endpoints that we propose to provide clinically meaningful results (reflecting a tangible benefit to patients). In addition, the resulting clinical data and results may be difficult to analyze. Even if the FDA does find our success criteria to be sufficiently validated and clinically meaningful, we may not achieve the pre-specified endpoints to a degree of statistical significance. This may be a particularly significant risk for many of the genetically defined diseases for which we plan to develop product candidates because many of these diseases have small patient populations, and designing and executing a rigorous clinical trial with appropriate statistical power is more difficult than with diseases that have larger patient populations. Further, even if we do achieve the pre-specified criteria, we may produce results that are unpredictable or inconsistent with the results of the non-primary endpoints or other relevant data. The FDA also weighs the benefits of a product against its risks, and the FDA may view the efficacy results in the context of safety as not being supportive of regulatory approval. Other regulatory authorities in the European Union and other countries, such as the Committee for Advanced Therapies, or CAT, may make similar comments with respect to these endpoints and data. Any product candidates we may develop will be based on a novel technology that makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval.

A Breakthrough Therapy Designation by the FDA, even if granted for any of our product candidates, may not lead to a faster development or regulatory review or approval process and it does not increase the likelihood that our product candidates will receive marketing approval.

We plan to seek a Breakthrough Therapy Designation for our product candidates if the clinical data support such a designation for one or more product candidates. A breakthrough therapy is defined as a drug or biologic that is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug, or biologic, may demonstrate

substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For product candidates that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Biologics designated as breakthrough therapies by the FDA may also be eligible for accelerated approval.

Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a Breakthrough Therapy Designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under non-expedited FDA review procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualify as breakthrough therapies, the FDA may later decide that the product no longer meets the conditions for qualification.

Our lead product candidate, MGTA-456, and any future product candidates may not be eligible for Orphan Drug status.

The United States and Europe may designate drugs for relatively small patient populations as orphan drugs. Orphan Drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process, but does make the product eligible for orphan drug exclusivity, reduced filing fees and specific tax credits. Generally, if a company receives the first marketing approval for a product with an Orphan Drug designation in the clinical indication for which it has such designation, the product is entitled to orphan drug exclusivity. Orphan drug exclusivity means that the FDA will not approve another application to market the same drug for the same indication, except in limited circumstances, for a period of seven years in the United States. This exclusivity, however, could block the approval of our proposed product candidates if a competitor obtains marketing approval before us. However, even if we obtain orphan drug exclusivity for any of our proposed product candidates, we may not be able to maintain it. For example, if a competitive product is shown to be clinically superior to our product candidates, any orphan drug exclusivity we have will not block the approval of such competitive product.

If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.

We may experience difficulties in patient enrollment in our clinical trials for a variety of reasons. The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of patients who remain in the study until its conclusion. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- the size of the patient population required for analysis of the trial’s primary endpoints;
- the proximity of patients to study sites;
- the design of the trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- our ability to obtain and maintain patient consents; and
- the risk that patients enrolled in clinical trials will drop out of the trials before completion.

In addition, our clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as our product candidates, and this competition will reduce the number and types of patients

available to us, because some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials in such clinical trial site.

Delays in patient enrollment may result in increased costs or may affect the timing or outcome of the planned clinical trials, which could prevent completion of these trials and adversely affect our ability to advance the development of our product candidates.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on research programs and product candidates that we identify for specific indications among many potential options. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial medicines or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable medicines. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing, or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate. Any such event could have a material adverse effect on our business, financial condition, results of operations, and prospects.

Even if we complete the necessary clinical trials, we cannot predict when, or if, we will obtain regulatory approval to commercialize a product candidate we may develop, and any such approval may be for a more narrow indication than we seek.

We cannot commercialize a product candidate until the appropriate regulatory authorities have reviewed and approved the product candidate. Even if any product candidates we may develop meet their safety and efficacy endpoints in clinical trials, the regulatory authorities may not complete their review processes in a timely manner, or we may not be able to obtain regulatory approval. Additional delays may result if an FDA Advisory Committee or other regulatory authority recommends non-approval or restrictions on approval. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action, or changes in regulatory authority policy during the period of product development, clinical trials, and the review process.

Regulatory authorities also may approve a product candidate for more limited indications than requested or they may impose significant limitations in the form of narrow indications, warnings or a Risk Evaluation and Mitigation Strategy, or REMS. These regulatory authorities may require precautions or contra-indications with respect to conditions of use, or they may grant approval subject to the performance of costly post-marketing clinical trials. In addition, regulatory authorities may not approve the labeling claims that are necessary or desirable for the successful commercialization of any product candidates we may develop. Any of the foregoing scenarios could materially harm the commercial prospects for any product candidates we may develop and materially adversely affect our business, financial condition, results of operations, and prospects.

A Fast Track Designation by the FDA, even if granted for any of our product candidates, may not lead to a faster development or regulatory review or approval process, and does not increase the likelihood that our product candidates will receive marketing approval.

If a drug is intended for the treatment of a serious or life-threatening condition and the drug demonstrates the potential to address unmet medical needs for this condition, the drug sponsor may apply for FDA Fast Track Designation for a particular indication. Marketing applications filed by sponsors of products in Fast Track development may qualify for priority review under the policies and procedures offered by the FDA, but the Fast Track Designation does not assure any such qualification or ultimate marketing approval by the FDA. Receipt of

Fast Track Designation may not result in a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures. In addition, the FDA may withdraw any Fast Track Designation at any time. We may seek Fast Track Designation for MGTA-456 or any other product candidates, but there is no assurance that the FDA will grant this status to any of our proposed product candidates.

We may seek priority review designation for MGTA-456 or our other product candidates, but we might not receive such designation, and even if we do, such designation may not lead to a faster development or regulatory review or approval process.

If the FDA determines that a product candidate offers a treatment for a serious condition and, if approved, the product would provide a significant improvement in safety or effectiveness, the FDA may designate the product candidate for priority review. A priority review designation means that the goal for the FDA to review an application is six months, rather than the standard review period of ten months. We may request priority review for our product candidates, however, we cannot assume that MGTA-456 or our other product candidates will meet the criteria for that designation. The FDA has broad discretion with respect to whether or not to grant priority review status to a product candidate, so even if we believe a particular product candidate is eligible for such designation or status, the FDA may decide not to grant it. Moreover, a priority review designation does not necessarily mean a faster development or regulatory review or approval process or necessarily confer any advantage with respect to approval compared to conventional FDA procedures. Receiving priority review from the FDA does not guarantee approval within the six-month review cycle or at all.

Results of preclinical studies and early clinical trials may not be predictive of results of future clinical trials, and such results do not guarantee approval of a product candidate by regulatory authorities.

The outcome of preclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of clinical trials do not necessarily predict success in the results of completed clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in earlier development, and we could face similar setbacks. The design of a clinical trial can determine whether its results will support approval of a product and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. In addition, preclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain regulatory approval for their product candidates. Even if we complete clinical development of MGTA-456, there can be no assurance that the FDA, EMA, or other regulatory authorities will approve MGTA-456 for marketing.

In some instances, there can be significant variability in safety or efficacy results between different clinical trials of the same product candidate due to numerous factors, including changes in trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the dosing regimen and other clinical trial procedures and the rate of dropout among clinical trial participants. If we fail to receive positive results in clinical trials of our product candidates, the development timeline and regulatory approval and commercialization prospects for our most advanced product candidate, and, correspondingly, our business and financial prospects would be negatively impacted.

Our product candidates for which we intend to seek approval may face competition from generic drugs or biosimilars sooner than anticipated.

With the enactment of the Biologics Price Competition and Innovation Act of 2009, or BPCIA, an abbreviated pathway for the approval of biosimilar and interchangeable biological products was created. The abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as interchangeable based on its similarity to an existing reference product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product is approved under a BLA. On March 6, 2015, the FDA approved the first biosimilar product under the BPCIA. However, the law is complex and is still being interpreted and implemented

by the FDA. As a result, its ultimate impact, implementation, and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

We believe that if any of our product candidates are approved as a biological product under a BLA it should qualify for the 12-year period of exclusivity. However, there is a risk that the FDA will not consider any of our product candidates to be reference products for competing products, potentially creating the opportunity for biosimilar competition sooner than anticipated. Additionally, this period of regulatory exclusivity does not apply to companies pursuing regulatory approval via their own traditional BLA, rather than via the abbreviated pathway. Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing. Finally, there has been public discussion of potentially decreasing the period of exclusivity from the current 12 years. If such a change were to be enacted, our product candidates, if approved, could have a shorter period of exclusivity than anticipated.

Enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and may affect the prices we may set.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any products for which we obtain marketing approval.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the Affordable Care Act, or the ACA, was enacted to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for health care and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. As implementation of the ACA is ongoing, the law appears likely to continue the downward pressure on pharmaceutical pricing, especially under the Medicare program, and may also increase our regulatory burdens and operating costs.

Moreover, the Drug Supply Chain Security Act imposes new obligations on manufacturers of pharmaceutical products related to product tracking and tracing. Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We are not sure whether additional legislative changes will be enacted, or whether the current regulations, guidance or interpretations will be changed, or what the impact of such changes on our business, if any, may be.

As an early stage small company that will be competing against numerous large, established companies that have substantially greater financial, technical, research manufacturing, marketing, distribution and other resources than us, we will be at a significant competitive disadvantage.

The pharmaceutical and biopharmaceutical industry is characterized by intense competition and rapid and significant technological changes and advancements. Many companies, research institutions and universities are doing research and development work in a number of areas similar to those that we focus on that could lead to the development of new products which could compete with and be superior to our product candidates.

Most of the companies with which we compete have substantially greater financial, technical, research, manufacturing, marketing, distribution and other resources than those of ours. A number of these companies may have or may develop technologies for developing products for treating various diseases, including certain inherited metabolic diseases such as Hurler’s syndrome and leukodystrophies, that could prove to be superior to ours. We expect technological developments in the pharmaceutical and biopharmaceutical and related fields to occur at a rapid rate, and we believe competition will intensify as advances in these fields are made. Accordingly,

we will be required to continue to devote substantial resources and efforts to research and development activities in order to potentially achieve and maintain a competitive position in this field. Products that we develop may become obsolete before we are able to market them or to recover all or any portion of our research and development expenses. We will be competing with respect to our products with companies that have significantly more experience and expertise in undertaking preclinical testing and human clinical trials with new or improved therapeutic products and obtaining regulatory approvals of such products. A number of these companies already market and may be in advanced phases of clinical testing of various drugs that will or may compete with our current product candidates or other future potential product candidates. Our competitors may develop or commercialize products more rapidly than we do or with significant advantages over any products we develop. Our competitors may therefore be more successful in commercializing their products than we are, which could adversely affect our competitive position and business.

In addition to larger pharmaceutical or biopharmaceutical companies that may develop different competing technologies or technologies within the transplant field, we will be competing with a number of smaller biotechnology companies that are focused on transplant technologies, which may include among others Gamida Cell Ltd., Nohla Therapeutics, Inc., and ExCellThera Inc. We are aware of Novartis' collaboration with Intellia Therapeutics, Inc. which includes efforts relating to expansion of HSCs that have been modified using CRISPR/Cas9 technology to express therapeutic proteins and delivered to patients for the treatment of potential treatment of blood disorders or primary immune deficiencies. Any programs and technology that develop as a result of this collaboration would likely compete directly with our E478 program.

Colleges, universities, governmental agencies and other public and private research organizations are becoming more active in seeking patent protection and licensing arrangements to collect royalties for use of technologies that they have developed, some of which may be directly competitive with our programs and product candidates, including our lead product candidate, MGTA-456.

Risks Related to Manufacturing and Commercialization

We rely on third parties to conduct our preclinical and clinical trials and will rely on them to perform other tasks for us. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or comply with regulatory requirements, we may not be able to obtain regulatory approval for or commercialize our product candidates and our business could be substantially harmed.

Although we have recruited a team that has experience with clinical trials, as a company we have no experience in conducting clinical trials. Moreover, we do not have the ability to independently conduct preclinical studies and clinical trials, and we have relied upon, and plan to continue to rely upon medical institutions, clinical investigators, contract laboratories and other third parties, or our CROs, to conduct preclinical studies and future clinical trials for our product candidates. We expect to rely heavily on these parties for execution of preclinical and future clinical trials for our product candidates and control only certain aspects of their activities. Nevertheless, we will be responsible for ensuring that each of our preclinical and clinical trials is conducted in accordance with the applicable protocol, legal and regulatory requirements and scientific standards and our reliance on CROs will not relieve us of our regulatory responsibilities. For any violations of laws and regulations during the conduct of our preclinical studies and clinical trials, we could be subject to warning letters or enforcement action that may include civil penalties up to and including criminal prosecution.

We and our CROs will be required to comply with regulations, including cGCPs for conducting, monitoring, recording and reporting the results of preclinical and clinical trials to ensure that the data and results are scientifically credible and accurate and that the trial patients are adequately informed of the potential risks of participating in clinical trials and their rights are protected. These regulations are enforced by the FDA, the Competent Authorities of the Member States of the European Economic Area and comparable foreign regulatory authorities for any drugs in clinical development. The FDA enforces cGCP regulations through periodic inspections of clinical trial sponsors, principal investigators and trial sites. If we or our CROs fail to comply with applicable cGCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that, upon inspection, the FDA will determine that any of our

future clinical trials will comply with cGCPs. In addition, our clinical trials must be conducted with product candidates produced in accordance with the requirements in cGMP regulations. Our failure or the failure of our CROs to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process and could also subject us to enforcement action.

Although we intend to design our planned clinical trials for our product candidates, for the foreseeable future CROs will conduct all of our planned clinical trials. As a result, many important aspects of our development programs, including their conduct and timing, will be outside of our direct control. Our reliance on third parties to conduct future preclinical studies and clinical trials will also result in less day-to-day control over the management of data developed through preclinical studies and clinical trials than would be the case if we were relying entirely upon our own staff.

If any of our relationships with these third-party CROs terminate, we may not be able to enter into arrangements with alternative CROs. If CROs do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols, regulatory requirements or for other reasons, any preclinical studies or clinical trials with which such CROs are associated with may be extended, delayed or terminated. In such cases, we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for our product candidates in the subject indication could be harmed, our costs could increase and our ability to generate revenue could be delayed.

The successful development of biopharmaceuticals and cell-based therapies, is highly uncertain.

Successful development of biopharmaceuticals and cell-based therapies, is highly uncertain and is dependent on numerous factors, many of which are beyond our control. Bone marrow transplant and cell-based therapies that appear promising in the early phases of development may fail to reach the market for several reasons including:

- preclinical study results may show the therapies to be less effective than desired or to have harmful or problematic side effects;
- clinical trial results may show the therapies to be less effective than expected (e.g., the trial failed to meet its primary endpoint) or to have unacceptable side effects or toxicities;
- failure to receive the necessary regulatory approvals or a delay in receiving such approvals. Among other things, such delays may be caused by slow enrollment in clinical trials, length of time to achieve study endpoints, additional time requirements for data analysis, or biologics license application, or BLA, preparation, discussions with the FDA, an FDA request for additional preclinical or clinical data, or unexpected safety or manufacturing issues;
- manufacturing costs, formulation issues, pricing or reimbursement issues, or other factors that make the therapy uneconomical; and
- the proprietary rights of others and their competing products and technologies that may prevent the therapy from being commercialized.

Success in preclinical studies and early clinical trials do not ensure that large-scale clinical trials will be successful. The length of time necessary to complete clinical trials and to submit an application for marketing approval for a final decision by a regulatory authority varies significantly from one therapy to the next, and may be difficult to predict.

Even if we are successful in getting market approval, commercial success of any of our product candidates will also depend in large part on the availability of coverage and adequate reimbursement from third-party payers, including government payers such as the Medicare and Medicaid programs and managed care organizations, which may be affected by existing and future health care reform measures designed to reduce the cost of health care. Third-party payers could require us to conduct additional studies, including post-marketing studies related to the cost effectiveness of a product, to qualify for reimbursement, which could be costly and divert our

resources. If government and other health care payers were not to provide adequate coverage and reimbursement levels for any of our products if approved, market acceptance and commercial success would be reduced.

In addition, if one of our product candidates is approved for marketing, we will be subject to significant regulatory obligations regarding the submission of safety and other post-marketing information and reports and registration, and will need to continue to comply (or ensure that our third party providers) comply with the FDA's current Good Manufacturing Practices, or cGMPs, and the FDA's current Good Clinical Practices, or GCPs, for any clinical trials that we conduct post-approval. In addition, there is always the risk that we or a regulatory authority might identify previously unknown problems with a product post-approval, such as adverse events of unanticipated severity or frequency. Compliance with these requirements is costly, and any failure to comply or other issues with our product candidates' post-market approval could have a material adverse effect on our business, financial condition and results of operations.

We may never obtain FDA approval for any of our product candidates in the United States, and even if we do, we may never obtain approval for or commercialize any of our product candidates in any other jurisdiction, which would limit our ability to realize their full market potential.

In order to eventually market any of our product candidates in any particular foreign jurisdiction, we must establish and comply with numerous and varying regulatory requirements on a jurisdiction-by-jurisdiction basis regarding safety and efficacy. Approval by the FDA in the United States, if obtained, does not ensure approval by regulatory authorities in other countries or jurisdictions. In addition, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not guarantee regulatory approval in any other country. Approval processes vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approval could result in difficulties and costs for us and require additional preclinical studies or clinical trials which could be costly and time-consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our products in those countries. The foreign regulatory approval process involves all of the risks associated with FDA approval. We do not have any product candidates approved for sale in any jurisdiction, including international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, or if regulatory approvals in international markets are delayed, our target market will be reduced and our ability to realize the full market potential of our products will be unrealized.

MGTA-456 has been affected by contamination issues in the past, and any future contamination in our or our third parties' manufacturing process, shortages of raw materials or reagents or failure of any of our key suppliers to deliver necessary components of our product candidates could result in delays in our clinical development or marketing schedules.

Given the nature of biologics manufacturing, there is a risk of contamination. For example, prior to our 2017 license of the product candidate from Novartis, our third-party manufacturer for MGTA-456 experienced contaminations, including microbial contaminations, in connection with the clinical manufacture of MGTA-456 which required disposal of contaminated product and led to delays in the manufacturing process. While we have not experienced contamination events in connection with the manufacture of MGTA-456 for our clinical use since licensing the product candidate, we cannot guarantee that we or our third-party vendors will be able to successfully prevent and remediate contaminations in the future in connection with the manufacture of MGTA-456 or our other current or future product candidates. Any contamination could materially adversely affect our or our third-party vendors' ability to produce our product candidates on schedule and could therefore harm our results of operations and cause reputational damage.

The raw materials required in our and our third-party vendors' manufacturing processes are derived from biological sources. We cannot assure you that we or our third-party vendors have, or will be able to obtain on commercially reasonable terms, or at all, sufficient rights to these materials derived from biological sources. Such raw materials are difficult to procure and may also be subject to contamination or recall. A material shortage, contamination, recall, or restriction on the use of biologically derived substances in the manufacture of

our product candidates could adversely impact or disrupt the clinical and commercial manufacturing of our product candidates, which could materially and adversely affect our operating results and development timelines.

We rely on third-party suppliers for the supply and manufacture of certain components of our technology and product candidates, including a single supplier in some cases. For example, an affiliate of the University of Minnesota is our only manufacturing partner for MGTA-456, and Bachem Americas, Inc. is currently the sole manufacturer of MGTA-145. See "Business—Licenses and Collaborations" for additional information regarding these relationships. Should our ability to procure the necessary components for our product candidates from our suppliers be compromised, our ability to continuously operate would be impaired until an alternative supplier is sourced, qualified and tested, which could delay or limit our ability to produce a clinical and commercial supply of our product candidates and harm our business.

If we use biological materials in a manner that causes injury, we may be liable for damages.

Our research and development activities involve the use of biological and hazardous materials. Although we believe our safety procedures for handling and disposing of these materials complies with federal, state and local laws and regulations, we cannot entirely eliminate the risk of accidental injury or contamination from the use, storage, handling or disposal of these materials. We do not carry specific biological waste insurance coverage, workers compensation or property and casualty and general liability insurance policies that include coverage for damages and fines arising from biological exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended or terminated.

Third-party manufacturers and any third-party collaborators may be unable to successfully scale-up manufacturing of MGTA-456 or our other current or future product candidates in sufficient quality and quantity, which would delay or prevent us from developing MGTA-456 or our other product candidates and commercializing approved products, if any.

In order to conduct clinical trials of MGTA-456 and our other current and future product candidates, we will need to work with third-party manufacturers to manufacture them in sufficient quantities. Our manufacturing partners or our third-party collaborators may be unable to successfully increase the manufacturing capacity of MGTA-456 and our other current or future product candidates in a timely or cost-effective manner, or at all. In addition, quality issues may arise during scale-up activities. If our manufacturing partners or collaborators are unable to successfully scale up the manufacture of our current or future product candidates in sufficient quality and quantity, the development, testing, and clinical trials of that product candidate may be delayed or infeasible, and marketing approval or commercial launch of any resulting product may be delayed or not obtained, which could significantly harm our business.

The commercial success of any of our product candidates will depend upon the degree of market acceptance by physicians, patients, third-party payors and others in the medical community.

Even with the requisite approvals from the FDA in the United States, the EMA in the European Union and other regulatory authorities internationally, the commercial success of our product candidates will depend, in part, on the acceptance of physicians, patients and health care payors of our product candidates as medically necessary, cost-effective and safe. Any product that we commercialize may not gain acceptance by physicians, patients, health care payors and others in the medical community. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenue and may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on several factors, including:

- the efficacy, durability and safety of such product candidates as demonstrated in clinical trials;
- the potential and perceived advantages of product candidates over alternative treatments;

- the cost of treatment relative to alternative treatments;
- the clinical indications for which the product candidate is approved by the FDA or the European Commission;
- the willingness of physicians to prescribe new therapies;
- the willingness of the target patient population to try new therapies;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA, EMA or other regulatory authorities, including any limitations or warnings contained in a product's approved labeling;
- relative convenience and ease of administration;
- the strength of marketing and distribution support;
- the timing of market introduction of competitive products;
- publicity concerning our products or competing products and treatments; and
- sufficient third-party payor coverage and adequate reimbursement.

Even if a potential product displays a favorable efficacy and safety profile in preclinical studies and clinical trials, market acceptance of the product will not be fully known until after it is launched.

If we are unable to successfully develop our current programs into a comprehensive portfolio of product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our current and future product candidates.

We are developing our product candidates so that they can each be used individually or in combination with each other. In particular, we are focused on a product development strategy that includes leveraging the synergies among a comprehensive portfolio of our product candidates. Our success may depend, in part, on our ability to develop a complementary product portfolio with product candidates that, together or individually, will address the major unmet needs inherent to the existing bone marrow transplant process. Given our limited experience in developing product candidates that have received marketing approval, we may not be successful in developing some of our product candidates. The failure of one of our product candidates to obtain regulatory approval or market acceptance may affect our ability to expand our market opportunities for our other product candidates or programs. Although we may develop product candidates that ultimately obtain marketing approval, if we are unable to successfully develop our current programs into a comprehensive portfolio of product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our current and future product candidates.

Coverage and reimbursement may be limited or unavailable in certain market segments for our product candidates, if approved, which could make it difficult for us to sell any product candidates or therapies profitably.

The success of our product candidates, if approved, depends on the availability of adequate coverage and reimbursement from third-party payors. In addition, because our product candidates represent new approaches to bone marrow transplant, we cannot be sure that coverage and reimbursement will be available for, or accurately estimate the potential revenue from our product candidates or assure that coverage and reimbursement will be available for any product that we may develop.

Patients who are provided medical treatment for their conditions generally rely on third-party payors to reimburse all or part of the costs associated with their treatment. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid, and commercial payors are critical to new product acceptance.

Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which drugs and treatments they will cover and the amount of reimbursement. Coverage and reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

In the U.S., no uniform policy of coverage and reimbursement for products exists among third-party payors. As a result, obtaining coverage and reimbursement approval of a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide to each payor supporting scientific, clinical and cost-effectiveness data for the use of our products on a payor-by-payor basis, with no assurance that coverage and adequate reimbursement will be obtained. Even if we obtain coverage for a given product, the resulting reimbursement payment rates might not be adequate for us to achieve or sustain profitability or may require co-payments that patients find unacceptably high. Additionally, third-party payors may not cover, or provide adequate reimbursement for, long-term follow-up evaluations required following the use of product candidates. Patients are unlikely to use our product candidates unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our product candidates. Because our product candidates may have a higher cost of goods than conventional therapies, and may require long-term follow up evaluations, the risk that coverage and reimbursement rates may be inadequate for us to achieve profitability may be greater. There is significant uncertainty related to insurance coverage and reimbursement of newly approved products. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our product candidates.

Payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives. For example, the Middle Class Tax Relief and Job Creation Act of 2012 required that the Centers for Medicare & Medicaid Services, the agency responsible for administering the Medicare program, or CMS, reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which served as a base for 2014 and subsequent years. In addition, effective January 1, 2014, CMS also began bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting. Additional state and federal healthcare reform measures are expected to be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for certain pharmaceutical products or additional pricing pressures.

Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our product candidates. There has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. We expect to experience pricing pressures in connection with the sale of any of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations, cost containment initiatives and additional legislative changes.

Ongoing healthcare legislative and regulatory reform measures may have a material adverse effect on our business and results of operations.

Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: (i) changes to our manufacturing arrangements; (ii) additions or modifications to product labeling; (iii) the recall or discontinuation of our products; or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Affordable Care Act was passed, which substantially changes the way health care is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The Affordable Care Act, or the ACA, among other things, subjects biological products to potential competition by lower-cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations, establishes annual fees and taxes on manufacturers of certain branded prescription drugs, and creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts (which will be increased to 70% effective January 1, 2019) off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

Some of the provisions of the ACA have yet to be fully implemented, while certain provisions have been subject to judicial and Congressional challenges, as well as efforts by the Trump administration to repeal or replace certain aspects of the ACA. For example, in Congress, the U.S. House of Representatives passed Affordable Care Act replacement legislation known as the American Health Care Act of 2017 in May 2017, which was not introduced in the Senate. However, The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Congress may consider other legislation to repeal or replace certain elements of the Affordable Care Act. In addition, since January 2017, President Trump has signed two Executive Orders designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Further, the Trump administration has concluded that cost-sharing reduction (CSR) payments to insurance companies required under the ACA have not received necessary appropriations from Congress and announced that it will discontinue these payments immediately until such appropriations are made. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA. A bipartisan bill to appropriate funds for CSR payments was introduced in the Senate, but the future of that bill is uncertain. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year. These reductions went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, will remain in effect through 2027 unless additional congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers.

These laws, and future state and federal healthcare reform measures may be adopted in the future, any of which may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our product candidates for which we may obtain regulatory approval or the frequency with which any such product candidate is prescribed or used.

European Union drug marketing and reimbursement regulations may materially affect our ability to market and receive coverage for our products in the European member states.

We intend to seek approval to market our product candidates in both the United States and in selected foreign jurisdictions. If we obtain approval in one or more foreign jurisdictions for our product candidates, we will be subject to rules and regulations in those jurisdictions. In some foreign countries, particularly those in the European Union, the pricing of biologics is subject to governmental control and other market regulations which could put pressure on the pricing and usage of our product candidates. In these countries, pricing negotiations with governmental authorities can take considerable time after obtaining marketing approval of a product candidate. In addition, market acceptance and sales of our product candidates will depend significantly on the availability of adequate coverage and reimbursement from third-party payors for our product candidates and may be affected by existing and future health care reform measures.

Much like the Anti-Kickback Statue prohibition in the United States, the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is also prohibited in the European Union. The provision of benefits or advantages to physicians is governed by the national anti-bribery laws of European Union Member States, such as the UK Bribery Act 2010. Infringement of these laws could result in substantial fines and imprisonment.

Payments made to physicians in certain European Union Member States must be publically disclosed. Moreover, agreements with physicians often must be the subject of prior notification and approval by the physician's employer, his or her competent professional organization and/or the regulatory authorities of the individual European Union Member States. These requirements are provided in the national laws, industry codes or professional codes of conduct, applicable in the European Union Member States. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

In addition, in most foreign countries, including the European Economic Area, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. In some countries, we may be required to conduct a clinical study or other studies that compare the cost-effectiveness of any of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the European Union do not follow price structures of the United States and generally prices tend to be significantly lower. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If pricing is set at unsatisfactory levels or if reimbursement of our products is unavailable or limited in scope or amount, our revenues from sales by us or our strategic partners and the potential profitability of any of our product candidates in those countries would be negatively affected.

European data collection is governed by restrictive regulations governing the use, processing, and cross-border transfer of personal information.

The collection and use of personal health data in the European Union is governed by the provisions of the Data Protection Directive, and as of May 2018 the General Data Protection Regulation, or GDPR. These directive imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, notification of data processing obligations to the competent national data protection authorities and the security and confidentiality of the personal data. The Data Protection Directive and GDPR also impose strict rules on the transfer of personal data out of the European Union to the United States. Failure to comply with the requirements of the Data Protection Directive, the GDPR, and the related national data protection laws of the European Union Member States may result in fines and other administrative penalties. The GDPR introduces new data protection requirements in the European Union and substantial fines for breaches of the data protection rules. The GDPR regulations may impose additional responsibility and liability in relation to personal data that we process and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects.

Laws and regulations governing international operations may preclude us from developing, manufacturing and selling certain products outside of the United States and require us to develop, implement and maintain costly compliance programs.

If we further expand our operations outside of the United States, we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering, authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the United States, or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. If we expand our presence outside of the United States, it will require us to dedicate additional resources to comply with these laws, and these laws may preclude us from developing, manufacturing, or selling certain products and product candidates outside of the United States, which could limit our growth potential and increase our development costs.

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The Securities and Exchange Commission, or SEC, also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

We currently have no marketing and sales organization and have no experience in marketing products. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our product candidates, we may not be able to generate product revenue.

We currently have no sales, marketing or distribution capabilities and have no experience in marketing products. We intend to develop an in-house marketing organization and sales force, which will require significant capital expenditures, management resources and time. We will have to compete with other pharmaceutical and biotechnology companies to recruit, hire, train and retain marketing and sales personnel.

If we are unable or decide not to establish internal sales, marketing and distribution capabilities, we will pursue collaborative arrangements regarding the sales and marketing of our products, however, there can be no assurance that we will be able to establish or maintain such collaborative arrangements, or if we are able to do so, that they will have effective sales forces. Any revenue we receive will depend upon the efforts of such third parties, which may not be successful. We may have little or no control over the marketing and sales efforts of such third parties and our revenue from product sales may be lower than if we had commercialized our product candidates ourselves. We also face competition in our search for third parties to assist us with the sales and marketing efforts of our product candidates.

There can be no assurance that we will be able to develop in-house sales and distribution capabilities or establish or maintain relationships with third-party collaborators to commercialize any product in the United States or overseas.

Even if we are able to commercialize any product candidates, such products may become subject to unfavorable pricing regulations, third-party reimbursement practices, or healthcare reform initiatives, which would harm our business.

The regulations that govern marketing approvals, pricing, and reimbursement for new medicines vary widely from country to country. In the United States, recently enacted legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a medicine before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a medicine in a particular country, but then be subject to price regulations that delay our commercial launch of the medicine, possibly for lengthy time periods, and negatively impact the revenues we are able to generate from the sale of the medicine in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if any product candidates we may develop obtain marketing approval.

Our ability to commercialize any medicines successfully also will depend in part on the extent to which reimbursement for these medicines and related treatments will be available from government health administration authorities, private health insurers, and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that reimbursement will be available for any medicine that we commercialize and, if reimbursement is available, the level of reimbursement. Reimbursement may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. If reimbursement is not available or is available only to limited levels, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval.

There may be significant delays in obtaining reimbursement for newly approved medicines, and coverage may be more limited than the purposes for which the medicine is approved by the FDA or similar regulatory authorities

outside the United States. Moreover, eligibility for reimbursement does not imply that any medicine will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale, and distribution. Interim reimbursement levels for new medicines, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the medicine and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost medicines and may be incorporated into existing payments for other services. Net prices for medicines may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of medicines from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our inability to promptly obtain coverage and profitable payment rates from both government-funded and private payors for any approved medicines we may develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize medicines, and our overall financial condition.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our product candidates.

We face an inherent risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize any products. For example, we may be sued if our product candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- injury to our reputation;
- withdrawal of clinical trial participants and inability to continue clinical trials;
- initiation of investigations by regulators;
- costs to defend the related litigation;
- a diversion of management’s time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- exhaustion of any available insurance and our capital resources;
- the inability to commercialize any product candidate; and
- a decline in our share price.

Our inability to obtain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop, alone or with collaborators. Although we currently carry $5,000,000 of clinical trial insurance, the amount of such insurance coverage may not be adequate, we may be unable to maintain such insurance, or we may not be able to obtain additional or replacement insurance at a reasonable cost, if at all. Our insurance policies may also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are

not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

Failure to obtain marketing approval in foreign jurisdictions would prevent any product candidates we may develop from being marketed in such jurisdictions, which, in turn, would materially impair our ability to generate revenue.

In order to market and sell any product candidates we may develop in the European Union and many other foreign jurisdictions, we or our third-party collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We or these third parties may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We may not be able to file for marketing approvals and may not receive necessary approvals to commercialize our medicines in any jurisdiction, which would materially impair our ability to generate revenue.

Foreign governments often impose strict price controls on approved products, which may adversely affect our future profitability in those countries, and the re-importation of drugs to the United States from foreign countries that impose price controls may adversely affect our future profitability.

Frequently foreign governments impose strict price controls on newly approved therapeutic products. If we obtain regulatory approval to sell products in foreign countries, we may be unable to obtain a price that provides an adequate financial return on our investment. Furthermore, legislation in the United States may permit re-importation of drugs from foreign countries into the United States, including re-importation from foreign countries where the drugs are sold at lower prices than in the United States due to foreign government-mandated price controls. Such a practice, especially if it is conducted on a widespread basis, may significantly reduce our potential United States revenues from any drugs that we are able to develop.

Even if we, or any collaborators we may have, obtain marketing approvals for any product candidates we develop, the terms of approvals and ongoing regulation of our products could require the substantial expenditure of resources and may limit how we, or they, manufacture and market our products, which could materially impair our ability to generate revenue.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising, and promotional activities for such medicine, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP requirements relating to quality control, quality assurance and corresponding maintenance of records and documents, and requirements regarding the distribution of samples to physicians and recordkeeping. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the medicine may be marketed or to the conditions of approval, or contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the medicine.

Accordingly, assuming we, or any collaborators we may have, receive marketing approval for one or more product candidates we develop, we, and such collaborators, and our and their contract manufacturers will continue to expend time, money, and effort in all areas of regulatory compliance, including manufacturing,

production, product surveillance, and quality control. If we and such collaborators are not able to comply with post-approval regulatory requirements, we and such collaborators could have the marketing approvals for our products withdrawn by regulatory authorities and our, or such collaborators', ability to market any future products could be limited, which could adversely affect our ability to achieve or sustain profitability. Further, the cost of compliance with post-approval regulations may have a negative effect on our business, operating results, financial condition, and prospects.

Risks Related to Intellectual Property

We are highly dependent on intellectual property licensed from third parties and termination of any of these licenses could result in the loss of significant rights, which would harm our business.

In April 2017, we entered into a license agreement with Novartis pursuant to which we were granted a worldwide license to certain intellectual property rights owned or controlled by Novartis, including patents, patent applications, proprietary information, know-how and other intellectual property, to develop, commercialize and sell one or more therapeutic products comprising MGTA-456 in the field of non-gene-edited/-modified HSCs. In addition, in November 2016, we entered into a license agreement with Harvard University, or Harvard, pursuant to which we were granted a worldwide license to research, develop and commercialize one or more therapeutic products under certain conditioning- and mobilization-related patents and patent applications owned or controlled by Harvard. Furthermore, in March 2018, we entered into a research, development option and license agreement with Heidelberg Pharma Research GmbH, or Heidelberg Pharma, pursuant to which we intend to combine our proprietary antibodies and Heidelberg Pharma's amanitin conjugates platform. We are dependent on the patents, know-how and proprietary technology, licensed from Novartis and Harvard. Furthermore, if we commercialize any products utilizing Heidelberg Pharma's amanitin conjugates platform, we will be dependent on the intellectual property rights we license from Heidelberg Pharma. Any termination of these licenses, or a finding that such intellectual property lacks legal effect, could result in the loss of significant rights and could harm our ability to commercialize MGTA-456, C100, C200, C300, G100, MGTA-145, and other product candidates.

Certain of our license agreements, including our agreements with Novartis, Harvard and Heidelberg Pharma, require us to use diligent efforts or meet development thresholds to maintain the license, including establishing a set timeline for developing and commercializing products. If we fail to comply with the obligations under our license agreements, including payment terms and diligence terms, our licensors may have the right to terminate our agreements, in which event we may not be able to develop, manufacture, market or sell the products covered by our agreements or may face other penalties under our agreements. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement. Termination of our license agreements or reduction or elimination of our rights under them may result in our having to negotiate a new or reinstated agreement, which may not be available to us on equally favorable terms, or at all, which may mean we are unable to develop or commercialize the affected product candidate or cause us to lose our rights under the agreement. In addition with respect to our license agreement with Novartis, Novartis has granted an exclusive license to Intellia Therapeutics, Inc., or Intellia, in the field of gene-modified HSCs under the same intellectual property that Novartis licensed to us. Accordingly, such rights are unavailable to us and in prosecuting, maintaining, enforcing and defending the licensed patents, Novartis may make decisions that may not be in our best interest. Moreover, if Novartis or Intellia take any action with respect to the licensed patents that results in a successful challenge to the licensed patents by any third party, such patents may be invalidated or held to be unenforceable and we may lose our rights under such patents, which would harm our business. See the section entitled "Business—Licenses and Collaborations" for additional information regarding our license agreements.

Further, the agreements under which we currently license intellectual property or technology from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations.

Accordingly, disputes may arise between us and our licensor, our licensor and its licensors, regarding intellectual property subject to a license agreement, including those relating to:

- the scope of rights, if any, granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the license agreement;
- whether our licensor or its licensor had the right to grant the license agreement;
- whether third parties are entitled to compensation or equitable relief, such as an injunction, for our use of the intellectual property without their authorization;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;
- whether we are complying with our obligations with respect to the use of the licensed technology in relation to our development and commercialization of product candidates;
- our involvement in the prosecution of the licensed patents and our licensors' overall patent enforcement strategy;
- the allocation of ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and by us and our partners; and
- the amounts of royalties, milestones or other payments due under the license agreement.

The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement. If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, or are insufficient to provide us the necessary rights to use the intellectual property, we may be unable to successfully develop and commercialize the affected product candidates. If we or any such licensors fail to adequately protect this intellectual property, our ability to commercialize our products could suffer. Any disputes with our licensors or any termination of the licenses on which we depend could have a material adverse effect on our business, financial condition, results of operations and prospects.

Our commercial success depends on our ability to obtain, maintain and protect our intellectual property and proprietary technology.

Our commercial success depends in large part on our ability to obtain, maintain and protect intellectual property protection through patents, trademarks, and trade secrets in the United States and other countries with respect to our proprietary product candidates. If we do not adequately protect our intellectual property rights, competitors may be able to erode, negate or preempt any competitive advantage we may have, which could harm our business and ability to achieve profitability.

To protect our proprietary position, we have submitted patent applications and may file other patent applications in the United States or abroad related to our product candidates that are important to our business. Although we in-license certain issued patents from Novartis related to our MGTA-456 product candidate, we do not own any issued patents related to our product candidates in any major market and most of the patent applications that we own in the United States are provisional patent applications. Provisional patent applications are not eligible to become issued patents until, among other things, we file a non-provisional patent application within 12 months of the filing of one or more of our related provisional patent applications. If we do not timely file any non-provisional patent applications, we may lose our priority date with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. While we intend to timely file non-provisional patent applications relating to our provisional patent applications, we cannot predict whether any such patent applications will result in the issuance of patents that provide us with any

competitive advantage. Moreover, the patent application and approval process is expensive and time-consuming. We may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

In some instances, agreements through which we license patent rights may not give us control over patent prosecution or maintenance, so that we may not be able to control which claims or arguments are presented, how claims are amended, and may not be able to secure, maintain, or successfully enforce necessary or desirable patent protection from those patent rights. We have not had and do not have primary control over patent prosecution and maintenance for certain of the patents and patent applications we license, including under our agreement with Novartis, and therefore cannot guarantee that these patents and applications will be prosecuted or maintained in a manner consistent with the best interests of our business. We cannot be certain that patent prosecution and maintenance activities by our licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents. Moreover, some of our in-licensed patents and patent applications are, and our future owned and licensed patents may be, co-owned with third parties. If we are unable to obtain an exclusive license to any such third party co-owners' interest in such patents or patent applications, such co-owners may be able to license their rights to other third parties, including our competitors, and our competitors could market competing products and technology. In addition, we may need the cooperation of any such co-owners of our patents in order to enforce such patents against third parties, and such cooperation may not be provided to us.

If the scope of the patent protection we or our licensors obtain is not sufficiently broad, we may not be able to prevent others from developing and commercializing technology and products similar or identical to ours. The degree of patent protection we require to successfully compete in the marketplace may be unavailable or severely limited in some cases and may not adequately protect our rights or permit us to gain or keep any competitive advantage. We cannot provide any assurances that any of our licensed patents have, or that any of our pending owned or licensed patent applications that mature into issued patents will include, claims with a scope sufficient to protect our product candidates or otherwise provide any competitive advantage, nor can we assure you that our licenses will remain in force. Other parties have developed or may develop technologies that may be related or competitive with our approach, and may have filed or may file patent applications and may have been issued or may be issued patents with claims that overlap or conflict with our patent applications, either by claiming the same compounds, formulations or methods or by claiming subject matter that could dominate our patent position. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Furthermore, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally twenty years after it is filed. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our patent portfolio may not provide us with adequate and continuing patent protection sufficient to exclude others from commercializing products similar to our product candidates. In addition, the patent portfolio licensed to us is, or may be, licensed to third parties, such as outside our field, and such third parties may have certain enforcement rights. Thus, patents licensed to us and any patents we own in the future could be put at risk of being invalidated or interpreted narrowly in litigation filed by or against another licensee or in administrative proceedings brought by or against another licensee in response to such litigation or for other reasons.

The patent protection we obtain for our product candidates may not be sufficient enough to provide us with any competitive advantage or our patents may be challenged.

Our owned and licensed patents and pending patent applications, if issued, may not provide us with any meaningful protection or prevent competitors from designing around our patent claims to circumvent our patents by developing similar or alternative technologies or therapeutics in a non-infringing manner. For example, a third party may develop a competitive therapy that provides benefits similar to one or more of our product candidates but falls outside the scope of our patent protection or license rights. If the patent protection provided by the

patents and patent applications we hold or pursue with respect to our product candidates is not sufficiently broad to impede such competition, our ability to successfully commercialize our product candidates could be negatively affected, which would harm our business. Currently, a significant portion of our patents and patent applications are in-licensed, though similar risks would apply to any patents or patent applications that we now own or may own or in-license in the future.

We, or any future partners, collaborators, or licensees, may fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. Therefore, we may miss potential opportunities to strengthen our patent position.

It is possible that defects of form in the preparation or filing of our patents or patent applications may exist, or may arise in the future, for example with respect to proper priority claims, inventorship, claim scope, or requests for patent term adjustments. If we or our partners, collaborators, licensees, or licensors, whether current or future, fail to establish, maintain or protect such patents and other intellectual property rights, such rights may be reduced or eliminated. If our partners, collaborators, licensees, or licensors, are not fully cooperative or disagree with us as to the prosecution, maintenance or enforcement of any patent rights, such patent rights could be compromised. If there are material defects in the form, preparation, prosecution, or enforcement of our patents or patent applications, such patents may be invalid and/or unenforceable, and such applications may never result in valid, enforceable patents. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

The patent position of biotechnology and pharmaceutical companies carries uncertainty. In addition, the determination of patent rights with respect to pharmaceutical compounds commonly involves complex legal and factual questions, which are dependent upon the current legal and intellectual property context, extant legal precedent and interpretations of the law by individuals. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are characterized by uncertainty.

Pending patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications. Assuming the other requirements for patentability are met, currently, the first to file a patent application is generally entitled to the patent. However, prior to March 16, 2013, in the United States, the first to invent was entitled to the patent. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file for patent protection of such inventions. Similarly, we cannot be certain that parties from whom we do or may license or purchase patent rights were the first to make relevant claimed inventions, or were the first to file for patent protection for them. If third parties have filed prior patent applications on inventions claimed in our patents or applications that were filed on or before March 15, 2013, an interference proceeding in the United States can be initiated by such third parties to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. If third parties have filed such prior applications after March 15, 2013, a derivation proceeding in the United States can be initiated by such third parties to determine whether our invention was derived from theirs.

Moreover, because the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, our owned and licensed patents or pending patent applications may be challenged in the courts or patent offices in the United States and abroad. There is no assurance that all of the potentially relevant prior art relating to our patents and patent applications has been found. If such prior art exists, it may be used to invalidate a patent, or may prevent a patent from issuing from a pending patent application. For example, such patent filings may be subject to a third-party submission of prior art to the U.S. Patent and Trademark Office, or USPTO, or to other patent offices around the world. Alternately or additionally, we may become involved in post-grant review procedures, oppositions, derivation proceedings, *ex parte* reexaminations, *inter partes* review, supplemental examinations, or interference proceedings or challenges in district court, in the United States or in various foreign

patent offices, including both national and regional, challenging patents or patent applications in which we have rights, including patents on which we rely to protect our business. An adverse determination in any such challenges may result in loss of the patent or in patent or patent application claims being narrowed, invalidated or held unenforceable, in whole or in part, or in denial of the patent application or loss or reduction in the scope of one or more claims of the patent or patent application, any of which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. In addition, given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized.

Pending and future patent applications may not result in patents being issued that protect our business, in whole or in part, or which effectively prevent others from commercializing competitive products. Competitors may also be able to design around our patents. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. In addition, the laws of foreign countries may not protect our rights to the same extent or in the same manner as the laws of the United States. For example, patent laws in various jurisdictions, including significant commercial markets such as Europe, restrict the patentability of methods of treatment of the human body more than United States law does. If these developments were to occur, they could have a material adverse effect on our ability to generate revenue.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that we or any of our future development partners will be successful in protecting our product candidates by obtaining and defending patents. These risks and uncertainties include the following:

- the USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case;
- patent applications may not result in any patents being issued;
- patents that may be issued or in-licensed may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- our competitors, many of whom have substantially greater resources and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with or eliminate our ability to make, use, and sell our potential product candidates;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the United States for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the United States may have patent laws less favorable to patentees than those upheld by U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing product candidates.

Issued patents that we have or may obtain or license may not provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner. Our competitors may also seek approval to market their own products similar to or otherwise competitive with our products. Alternatively, our competitors may seek to market generic versions of any approved products by submitting Abbreviated New Drug Applications, or ANDAs, to the FDA in which they claim that patents owned or licensed by us are invalid, unenforceable or not infringed. In these circumstances, we may need to defend or assert our patents, or both, including by filing lawsuits alleging patent infringement. In

any of these types of proceedings, a court or other agency with jurisdiction may find our patents invalid or unenforceable, or that our competitors are competing in a non-infringing manner. Thus, even if we have valid and enforceable patents, these patents still may not provide protection against competing products or processes sufficient to achieve our business objectives. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position may be harmed.

In addition to the protection afforded by patents, we rely upon unpatented trade secret protection, unpatented know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our contractors, collaborators, scientific advisors, employees and consultants and invention assignment agreements with our consultants and employees. However, we may not obtain these agreements in all circumstances, and individuals with whom we have these agreements may not comply with their terms. The assignment of intellectual property rights under these agreements may not be self-executing or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. In addition, we may not be able to prevent the unauthorized disclosure or use of our technical know-how or other trade secrets by the parties to these agreements despite the existence generally of confidentiality agreements and other contractual restrictions. Monitoring unauthorized uses and disclosures is difficult and we do not know whether the steps we have taken to protect our proprietary technologies will be effective. If any of the contractors, collaborators, scientific advisors, employees and consultants who are parties to these agreements breaches or violates the terms of any of these agreements, we may not have adequate remedies for any such breach or violation. As a result, we could lose our trade secrets. Enforcing a claim against a third party that illegally obtained and is using our trade secrets, like patent litigation, is expensive and time-consuming and the outcome is unpredictable. In addition, courts outside the United States are sometimes less willing or unwilling to protect trade secrets.

Moreover, our trade secrets could otherwise become known or be independently discovered by our competitors or other third parties. Competitors and other third parties could purchase our product candidates and attempt to replicate some or all of the competitive advantages we derive from our development efforts, willfully infringe our intellectual property rights, design around our protected technology or develop their own competitive technologies that fall outside of our intellectual property rights. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If our trade secrets are not adequately protected or sufficient to provide an advantage over our competitors, our competitive position could be adversely affected, as could our business. Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating our trade secrets.

Third-party claims of intellectual property infringement, misappropriation or other violations may prevent or delay our product discovery and development efforts and have a material adverse effect on our business.

Our commercial success depends in part on our avoiding infringement, misappropriation and other violations of the patents and proprietary rights of third parties. There is a substantial amount of litigation involving patents and other intellectual property rights in the biotechnology and pharmaceutical industries, as well as administrative proceedings for challenging patents, including interference and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. Recently, under U.S. patent reform, new procedures including *inter partes* review and post grant review have been implemented. As stated above, this reform will bring uncertainty to the possibility of challenge to our patents in the future. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing our product candidates. As the biotechnology and pharmaceutical industries expand and

more patents are issued, the risk increases that our product candidates may give rise to claims of infringement of the patent rights of others.

Third parties may assert that we are employing their proprietary technology without authorization. For example, we are aware of certain patent applications owned by a third party with claims that if issued in their present form could be construed to cover C200. If such patent claims are issued, the third party may seek to allege that our development and commercialization of C200 infringes such patents and file a patent infringement lawsuit against us in the future. While we believe we would have valid defenses against any such allegation or lawsuit, such defenses may be unsuccessful. In this regard, patents issued in the U.S. by law enjoy a presumption of validity that can be rebutted only with evidence that is "clear and convincing," a heightened standard of proof. There may also be third-party patents of which we are currently unaware with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of our product candidates, constructs or molecules used in or formed during the manufacturing process, or any final product itself, the holders of any such patents may be able to block our ability to commercialize the product candidate unless we obtained a license under the applicable patents, or until such patents expire or they are finally determined to be held invalid or unenforceable. Similarly, if any third-party patent were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, including combination therapy or patient selection methods, the holders of any such patent may be able to block our ability to develop and commercialize the product candidate unless we obtained a license or until such patent expires or is finally determined to be held invalid or unenforceable. In either case, such a license may not be available on commercially reasonable terms or at all. Even if we obtained such a license, it may only be non-exclusive, which would permit third parties to use the same intellectual property and compete with us. If we are unable to obtain a necessary license to a third-party patent on commercially reasonable terms, or at all, we may be unable to commercialize our product candidates or such efforts may be impaired or delayed, which could in turn significantly harm our business.

Parties making claims against us may seek and obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. We may not have sufficient resources to bring these actions to a successful conclusion. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of shares of our common stock.

In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties or redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. We cannot predict whether any such license would be available at all or whether it would be available on commercially reasonable terms. Furthermore, even in the absence of litigation, we may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize our product candidates, which could harm our business significantly. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Noncompliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

Some intellectual property that we have in-licensed may have been discovered through government funded programs and thus may be subject to federal regulations such as "march-in" rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit our exclusive rights, and limit our ability to contract with non-U.S. manufacturers.

Many of the intellectual property rights we have licensed are generated through the use of U.S. government funding and are therefore subject to certain federal regulations. As a result, the U.S. government may have certain rights to intellectual property embodied in our current or future product candidates pursuant to the Bayh-Dole Act of 1980, or Bayh-Dole Act. These U.S. government rights in certain inventions developed under a government-funded program include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if we, or the applicable licensor, fail to disclose the invention to the government and fail to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us or the applicable licensor to expend substantial resources. In addition, the U.S. government requires that any products embodying the subject invention or produced through the use of the subject invention be manufactured substantially in the United States. The manufacturing preference requirement can be waived if the owner of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. manufacturers may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property. To the extent any of our current or future intellectual property is generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply.

We may become involved in lawsuits to protect or enforce our patents or other intellectual property, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents, trademarks, copyrights or other intellectual property. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming and divert the time and attention of our management and scientific personnel. Any claims we assert against perceived infringers could provoke these parties to assert counterclaims against us alleging that we infringe their patents, in addition to counterclaims asserting that our patents are invalid or unenforceable, or both. In any patent infringement proceeding, there is a risk that a court will decide that a patent of ours is invalid or

unenforceable, in whole or in part, and that we do not have the right to stop the other party from using the invention at issue. There is also a risk that, even if the validity of such patents is upheld, the court will construe the patent's claims narrowly or decide that we do not have the right to stop the other party from using the invention at issue on the grounds that our patent claims do not cover the invention. An adverse outcome in a litigation or proceeding involving our patents could limit our ability to assert our patents against those parties or other competitors, and may curtail or preclude our ability to exclude third parties from making and selling similar or competitive products. Any of these occurrences could adversely affect our competitive business position, business prospects and financial condition. Similarly, if we assert trademark infringement claims, a court may determine that the marks we have asserted are invalid or unenforceable, or that the party against whom we have asserted trademark infringement has superior rights to the marks in question. In this case, we could ultimately be forced to cease use of such trademarks.

Even if we establish infringement, the court may decide not to grant an injunction against further infringing activity and instead award only monetary damages, which may or may not be an adequate remedy Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of shares of our common stock. Moreover, there can be no assurance that we will have sufficient financial or other resources to file and pursue such infringement claims, which typically last for years before they are concluded. Even if we ultimately prevail in such claims, the monetary cost of such litigation and the diversion of the attention of our management and scientific personnel could outweigh any benefit we receive as a result of the proceedings. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

Changes to the patent law in the United States and other jurisdictions could diminish the value of patents in general, thereby impairing our ability to protect our product candidates.

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the United States has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. For example, in the case, *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, the U.S. Supreme Court held that certain claims to DNA molecules are not patentable. While we do not believe that any of the patents owned or licensed by us will be found invalid based on this decision, we cannot predict how future decisions by the courts, the U.S. Congress or the USPTO may impact the value of our patents.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting, maintaining, defending and enforcing patents on our product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not

obtained patent protection to develop their own drugs and may export otherwise infringing drugs to territories where we have patent protection, but enforcement rights are not as strong as those in the United States. These drugs may compete with our product candidates and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of some countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful.

Many countries have compulsory licensing laws under which a patent owner may be compelled under specified circumstances to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In those countries, we may have limited remedies if patents are infringed or if we are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license, which could adversely affect our business, financial condition, results of operations, and prospects.

Patent terms may be inadequate to protect our competitive position on our product candidates for an adequate amount of time.

Patents have a limited lifespan. In the U.S., if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be available, but the life of a patent, and the protection it affords, is limited. Even if patents covering our product candidates are obtained, once the patent life has expired for a product candidate, we may be open to competition from competitive medications, including generic medications. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such product candidates might expire before or shortly after such product candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing product candidates similar or identical to ours.

Depending upon the timing, duration and conditions of any FDA marketing approval of our product candidates, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Amendments, and similar legislation in the European Union. The Hatch-Waxman Amendments permit a patent term extension of up to five years for a patent covering an approved product as compensation for effective patent term lost during product development and the FDA regulatory review process. However, we may not receive an extension if we fail to exercise due diligence during the testing phase or regulatory review process, fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Moreover, the length of the extension could be less than we request. Only one patent per approved product can be extended, the extension cannot extend the total patent term beyond 14 years from approval and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. If we are unable to obtain patent term extension or the term of any such extension is less than we request, the period during which we can enforce our patent rights for the applicable product candidate will be shortened and our competitors may obtain approval to market competing products sooner. As a result, our revenue from applicable products could be reduced. Further, if this occurs, our competitors may take advantage of our investment in development and trials by referencing our clinical and preclinical data and launch their product earlier than might

otherwise be the case, and our competitive position, business, financial condition, results of operations, and prospects could be materially harmed.

Third parties may assert that our employees or consultants have wrongfully used or disclosed confidential information or misappropriated trade secrets.

We employ individuals who were previously employed at universities or other biopharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of a former employer or other third parties. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Intellectual property rights do not necessarily address all potential threats.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to make products that are similar to any product candidates we may develop or utilize similar technology but that are not covered by the claims of the patents that we license or may own in the future;
- we, or our current or future licensors might not have been the first to make the inventions covered by the issued patent or pending patent application that we license or may own in the future;
- we, or our current or future licensors might not have been the first to file patent applications covering certain of our or their inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights;
- it is possible that our pending owned or licensed patent applications or those that we may own or license in the future will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may harm our business; and
- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

Should any of these events occur, they could harm our business, financial condition, results of operations, and prospects.

Risks Related to Our Dependence on Third Parties

We expect to depend on collaborations with third parties for the research, development, and commercialization of certain of the product candidates we may develop. If any such collaborations are not successful, we may not be able to capitalize on the market potential of those product candidates.

We anticipate seeking third-party collaborators for the research, development, and commercialization of certain of the product candidates we may develop. Our likely collaborators for any other collaboration arrangements include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies, and biotechnology companies. If we enter into any such arrangements with any third parties, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of any product candidates we may seek to develop with them. Our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. We cannot predict the success of any collaboration that we enter into.

Collaborations involving our research programs or any product candidates we may develop, pose the following risks to us:

- Collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations.
- Collaborators may not pursue development and commercialization of any product candidates we may develop or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors such as an acquisition that diverts resources or creates competing priorities.
- Collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials, or require a new formulation of a product candidate for clinical testing.
- Collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our medicines or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours.
- Collaborators with marketing and distribution rights to one or more medicines may not commit sufficient resources to the marketing and distribution of such medicine or medicines.
- Collaborators may not properly obtain, maintain, enforce, or defend our intellectual property or proprietary rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our proprietary information or expose us to potential litigation.
- Disputes may arise between the collaborators and us that result in the delay or termination of the research, development, or commercialization of our medicines or product candidates or that result in costly litigation or arbitration that diverts management attention and resources.
- We may lose certain valuable rights under circumstances identified in our collaborations, including if we undergo a change of control.
- Collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.
- Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. If a present or future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program under such collaboration could be delayed, diminished, or terminated.

If our collaborations do not result in the successful development and commercialization of products, or if one of our collaborators terminates its agreement with us, we may not receive any future research funding or milestone or royalty payments under the collaboration. If we do not receive the funding we expect under these agreements,

our development of product candidates could be delayed, and we may need additional resources to develop product candidates. In addition, if one of our collaborators terminates its agreement with us, we may find it more difficult to find a suitable replacement collaborator or attract new collaborators, and our development programs may be delayed or the perception of us in the business and financial communities could be adversely affected. All of the risks relating to product development, regulatory approval, and commercialization described in this prospectus apply to the activities of our collaborators.

We have in the past and may in the future decide to collaborate with pharmaceutical and biotechnology companies for the development and potential commercialization of any product candidates we may develop. These relationships, or those like them, may require us to incur non-recurring and other charges, increase our near- and long-term expenditures, issue securities that dilute our existing stockholders, or disrupt our management and business. In addition, we could face significant competition in seeking appropriate collaborators, and the negotiation process is time-consuming and complex. Our ability to reach a definitive collaboration agreement will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration, and the proposed collaborator's evaluation of several factors. If we license rights to any product candidates we or our collaborators may develop, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture.

We are developing E478 specifically to partner with gene therapy companies. If we are unable to find willing collaborators, this may adversely affect the development of E478 and our business.

We are developing E478 specifically to partner and collaborate with gene therapy companies. In particular, we seek to selectively pursue collaboration arrangements with companies that have particular technology, expertise or resources for the development of E478, if approved. However, we may not be able to execute on such collaboration and any collaboration that we may enter into may not be successful. If we are unable to identify partners whose capabilities complement and integrate well with ours and reach collaboration arrangements with such partners on a timely basis, on acceptable terms or at all, or if the arrangements we establish are unproductive for us, we may fail to meet our business and development objectives for E478, which may adversely affect our business.

If we are not able to establish collaborations on commercially reasonable terms, we may have to alter our development and commercialization plans.

Our product development and research programs and the potential commercialization of any product candidates we may develop will require substantial additional cash to fund expenses. For some of the product candidates we may develop, we may decide to collaborate with other pharmaceutical and biotechnology companies for the development and potential commercialization of those product candidates. For example, in connection with the Novartis Agreement, we issued to Novartis, 2,500,000 shares of Series A preferred stock and 643,550 shares of Series B preferred stock, causing our stockholders to experience dilution. If in the future, we enter into collaborations with other third parties, we may issue additional equity as part of such collaboration.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration, and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge, and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us.

Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

If any party to which we have outsourced certain functions fails to perform its obligations under agreements with us, the development and commercialization of our product candidates and any future product candidates could be delayed or terminated.

To the extent that we rely on third party individuals or other companies to manage the day-to-day conduct of our clinical trials or to manufacture, sell or market our current product candidates or any future product candidates, we will be dependent on the timeliness and effectiveness of their efforts. If a clinical research management organization that we might utilize is unable to allocate sufficient qualified personnel to our studies or if the work performed by it does not fully satisfy the rigorous requirements of the FDA, we may encounter substantial delays and increased costs in completing our clinical trials. If a firm producing humanized forms of our molecular antibody product candidates or a manufacturer of the raw material or finished product for our clinical trials is unable to meet our time schedules or cost parameters, the timing of our clinical trials and development of our product candidates may be adversely affected. Any manufacturer that we select may encounter difficulties in scaling-up the manufacture of new products in commercial quantities, including problems involving product yields, product stability or shelf life, quality control, adequacy of control procedures and policies, compliance with FDA regulations and the need for further FDA approval of any new manufacturing processes and facilities. The manufacture of clinical supplies for studies and commercial quantities of our current product candidates and any future product candidates are likely to be inherently more difficult and costly than typical chemical pharmaceuticals. This could delay commercialization of any of our product candidates, if approved, or reduce the profitability of these candidates for us. If any of these occur, the development and commercialization of our product candidates could be delayed, curtailed or terminated because we may not have sufficient financial resources or capabilities to continue such development and commercialization on our own.

We expect to continue to rely on third parties to manufacture our clinical product supplies, and we intend to rely on third parties to produce and process our product candidates, if approved.

We do not currently own any facility that may be used as our clinical-scale manufacturing and processing facility and must eventually rely on outside vendors to manufacture supplies and process our product candidates. We have not yet caused any product candidates to be manufactured or processed on a commercial scale and may not be able to do so for any of our product candidates. We will make changes as we work to optimize the manufacturing process, and we cannot be sure that even minor changes in the process will result in therapies that are safe and effective.

The facilities used by our contract manufacturers to manufacture our product candidates must be approved by the FDA or other foreign regulatory agencies pursuant to inspections that will be conducted after we submit an application to the FDA or other foreign regulatory agencies. We do not control the manufacturing process of, and will be completely dependent on, our contract manufacturing partners for compliance with regulatory requirements, known as cGMP requirements for manufacture of our product candidates. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or other regulatory authorities, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

In addition, should any of our agreements with our contract manufacturers terminate, in particular the agreements with the University of Minnesota and Heidelberg Pharma, they may be difficult to replace if we were no longer able to rely on them.

Risks Related to Employee Matters, Managing Growth and Other Risks Related to Our Business

We will need to grow the size of our organization, and we may experience difficulties in managing this growth.

As of February 28, 2018, we had 44 full-time employees. As our development, manufacturing and commercialization plans and strategies develop, and as we transition into operating as a public company, we expect to need and are actively recruiting additional managerial, operational, sales, marketing, financial and other personnel. Future growth would impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, maintaining and motivating additional employees;
- managing our internal development efforts effectively, including the clinical, FDA and international regulatory review process for our product candidates, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

Our future financial performance and our ability to develop, manufacture and commercialize our product candidates will depend, in part, on our ability to effectively manage any future growth, and our management may also have to divert financial and other resources, and a disproportionate amount of its attention away from day-to-day activities in order to devote a substantial amount of time, to managing these growth activities.

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain independent organizations, advisors and consultants to provide certain services, including substantially all aspects of regulatory approval, clinical management and manufacturing. We cannot assure you that the services of independent organizations, advisors and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by consultants is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval of our product candidates or otherwise advance our business. We cannot assure you that we will be able to manage our existing consultants or find other competent outside contractors and consultants on economically reasonable terms, or at all.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop and commercialize our product candidates and, accordingly, may not achieve our research, development and commercialization goals.

We expect to expand our development, regulatory, and future sales and marketing capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

We expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of drug development, regulatory affairs, and sales and marketing. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational, and financial systems, expand our facilities, and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expected expansion of our operations or recruit and train additional qualified personnel. Moreover, the expected physical expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

If we lose key management personnel, or if we fail to recruit additional highly skilled personnel, our ability to identify and develop new or next generation product candidates will be impaired, could result in loss of markets or market share and could make us less competitive.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, particularly our Chief Executive Officer, the members of our executive team listed under "Management" located elsewhere in this prospectus, and key scientific and medical personnel employees. The loss of the services of any of our executive officers, key employees, and scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business. The loss of the services of any of our executive officers, key employees, and scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business.

We conduct our operations at our facility in Cambridge, Massachusetts. This region is headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel in our market is intense and may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all.

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have provided stock options that vest over time. The value to employees of stock options that vest over time may be significantly affected by movements in our stock price that are beyond our control, and may at any time be insufficient to counteract more lucrative offers from other companies. Despite our efforts to retain valuable employees, members of our management, scientific and development teams may terminate their employment with us on short notice. Although we have employment offer letters with our key employees, these agreements provide for at-will employment, which means that any of our employees could leave our employment at any time, with or without notice. We do not maintain "key man" insurance policies on the lives of these individuals or the lives of any of our other employees. Our success also depends on our ability to continue to attract, retain and motivate highly skilled junior, mid-level and senior managers as well as junior, mid-level and senior scientific and medical personnel.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud. As a result, stockholders could lose confidence in our financial and other public reporting, which would harm our business and the trading price of our common stock.

Effective internal controls over financial reporting are necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, are designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations. In addition, any testing by us conducted in connection with Section 404 of the Sarbanes-Oxley Act of 2002, or any subsequent testing by our independent registered public accounting firm, may reveal deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements or identify other areas for further attention or improvement. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our stock.

We will be required to disclose changes made in our internal controls and procedures on a quarterly basis and our management will be required to assess the effectiveness of these controls annually. However, for as long as we are an "emerging growth company" under the JOBS Act, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal controls over financial reporting pursuant to Section 404. We could be an "emerging growth company" for up to five years. An independent assessment of the effectiveness of our internal controls over financial reporting could detect problems that our management's

assessment might not. Undetected material weaknesses in our internal controls over financial reporting could lead to financial statement restatements and require us to incur the expense of remediation.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and stock price.

As widely reported, global credit and financial markets have experienced extreme volatility and disruptions in the past several years, including severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur. Our general business strategy may be adversely affected by any such economic downturn, volatile business environment or continued unpredictable and unstable market conditions. If the current equity and credit markets deteriorate, or do not improve, it may make any necessary debt or equity financing more difficult, more costly, and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, manufacturers and other partners may not survive these difficult economic times, which could directly affect our ability to attain our operating goals on schedule and on budget.

At December 31, 2017, we had approximately $51.4 million of cash and cash equivalents. While we are not aware of any downgrades, material losses, or other significant deterioration in the fair value of our cash equivalents since December 31, 2017, no assurance can be given that further deterioration of the global credit and financial markets would not negatively impact our current portfolio of cash equivalents or our ability to meet our financing objectives. Furthermore, our stock price may decline due in part to the volatility of the stock market and the general economic downturn.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations, and those of our CMOs, our CROs and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers are affected by a man-made or natural disaster or other business interruption.

Our internal computer systems, or those used by our CMOs, CROs or other contractors or consultants, may fail or suffer security breaches.

Despite the implementation of security measures, our internal computer systems and those of our future CMOs, future CROs and other contractors and consultants are vulnerable to damage from computer viruses and unauthorized access. While we have not experienced any such material system failure or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we may rely on third parties for the manufacture of our product candidates and to conduct clinical trials, and similar events relating to their computer systems could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidates could be delayed.

Our employees, independent contractors, consultants, commercial partners and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk of employee fraud or other illegal activity by our employees, independent contractors, consultants, commercial partners and vendors. Misconduct by these parties could include intentional, reckless and/or negligent conduct that fails to comply with the laws of the FDA and other similar foreign regulatory bodies, provide true, complete and accurate information to the FDA and other similar foreign regulatory bodies, comply with manufacturing standards we have established, comply with healthcare fraud and abuse laws in the United States and similar foreign fraudulent misconduct laws, or report financial information or data accurately or to disclose unauthorized activities to us. If we obtain FDA approval of any of our product candidates and begin commercializing those products in the United States, our potential exposure under such laws will increase significantly, and our costs associated with compliance with such laws are also likely to increase. These laws may impact, among other things, our current activities with principal investigators and research patients, as well as proposed and future sales, marketing and education programs.

Our relationships with healthcare providers and physicians and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors in the United States and elsewhere play a primary role in the recommendation and prescription of pharmaceutical products. Arrangements with third-party payors and customers can expose pharmaceutical manufacturers to broadly applicable fraud and abuse and other healthcare laws and regulations, including, without limitation, the federal Anti-Kickback Statute and the federal False Claims Act, which may constrain the business or financial arrangements and relationships through which such companies sell, market and distribute pharmaceutical products. In particular, the promotion, sales and marketing of healthcare items and services, as well as certain business arrangements in the healthcare industry, are subject to extensive laws designed to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, structuring and commission(s), certain customer incentive programs and other business arrangements generally. Activities subject to these laws also involve the improper use of information obtained in the course of patient recruitment for clinical trials. The applicable federal, state and foreign healthcare laws and regulations laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe, or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce, or in return for, either the referral of an individual, or the purchase, lease, order or recommendation of any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. A person or entity can be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers, and formulary managers on the other. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution;
- federal civil and criminal false claims laws and civil monetary penalty laws, including the False Claims Act, or FCA, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment to, or approval by Medicare, Medicaid, or other federal healthcare programs, knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim or an obligation to pay or transmit money to the federal government, or knowingly concealing or knowingly and improperly avoiding or decreasing

an obligation to pay money to the federal government. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to "cause" the submission of false or fraudulent claims. The FCA also permits a private individual acting as a "whistleblower" to bring actions on behalf of the federal government alleging violations of the FCA and to share in any monetary recovery;

- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations, or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters. Similar to the federal Anti-Kickback Statute, a person or entity can be found guilty of violating HIPAA without actual knowledge of the statute or specific intent to violate it;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose, among other things, requirements on certain covered healthcare providers, health plans, and healthcare clearinghouses as well as their respective business associates that perform services for them that involve the use, or disclosure of, individually identifiable health information, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions;
- the federal Physician Payment Sunshine Act, created under the Health Reform Law, and its implementing regulations, which require manufacturers of drugs, devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the United States Department of Health and Human Services, or HHS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members; and
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers.

Additionally, we are subject to state and foreign equivalents of each of the healthcare laws described above, among others, some of which may be broader in scope and may apply regardless of the payor.

Pricing and rebate programs must comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990 and more recent requirements in the Affordable Care Act. If products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Products must meet applicable child-resistant packaging requirements under the U.S. Poison Prevention Packaging Act. Manufacturing, sales, promotion and other activities also are potentially subject to federal and state consumer protection and unfair competition laws.

The distribution of pharmaceutical products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage and security requirements intended to prevent the unauthorized sale of pharmaceutical products.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies often scrutinize interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time- and resource-consuming and can divert a company's attention from the business.

The failure to comply with any of these laws or regulatory requirements subjects entities to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in civil, criminal and administrative penalties, damages, fines, disgorgement, individual imprisonment, possible exclusion from participation in federal and state funded healthcare programs, contractual damages and the curtailment or restricting of our operations, as well as additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws. Any action for violation of these laws, even if successfully defended, could cause a pharmaceutical manufacturer to incur significant legal expenses and divert management's attention from the operation of the business. Prohibitions or restrictions on sales or withdrawal of future marketed products could materially affect business in an adverse way. Effective upon the completion of this offering, we will adopt a code of business conduct and ethics, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent inappropriate conduct may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Efforts to ensure that our business arrangements will comply with applicable healthcare laws may involve substantial costs. It is possible that governmental and enforcement authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law interpreting applicable fraud and abuse or other healthcare laws and regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, disgorgement, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. In addition, the approval and commercialization of any of our product candidates outside the United States will also likely subject us to foreign equivalents of the healthcare laws mentioned above, among other foreign laws.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change" (generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period), the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income may be limited. As a result of our most recent private placements and other transactions that have occurred over the past three years, we may have experienced, and, upon completion of this offering, may experience, an "ownership change." We may also experience ownership changes in the future as a result of subsequent shifts in our stock ownership. As of December 31, 2017, we had U.S. net operating loss carryforwards of approximately $18.7 million and U.S. research and development credits of $1.0 million, which could be limited if we experience an "ownership change."

We may not be successful in finding strategic collaborators for continuing development of certain of our product candidates or successfully commercializing or competing in the market for certain indications.

Because we have limited financial and managerial resources, we focus on research programs and product candidates that we identify for specific indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our

resource allocation decisions may cause us to fail to timely capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate. and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate. The terms of any additional collaborations or other arrangements that we may establish may not be favorable to us.

We may also be restricted under existing collaboration agreements from entering into future agreements on certain terms with potential collaborators. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the product candidate for which we are seeking to collaborate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate product revenue.

In addition, any collaborations that we enter into may not be successful. The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators. Collaborators generally have significant discretion in determining the efforts and resources that they will apply to these collaborations. Disagreements between parties to a collaboration arrangement regarding clinical development and commercialization matters can lead to delays in the development process or commercializing the applicable product candidate and, in some cases, termination of the collaboration arrangement. These disagreements can be difficult to resolve if neither of the parties has final decision-making authority. Collaborations with pharmaceutical or biotechnology companies and other third parties often are terminated or allowed to expire by the other party. Any such termination or expiration would adversely affect us financially and could harm our business reputation.

We face significant competition from other biotechnology and pharmaceutical companies, and our operating results will suffer if we fail to compete effectively.

The biopharmaceutical industry is characterized by intense competition and rapid innovation. Our competitors may be able to develop other compounds or drugs that are able to achieve similar or better results. Our potential competitors include major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical companies and universities and other research institutions. Many of our competitors have substantially greater financial, technical and other resources, such as larger research and development staff and experienced marketing and manufacturing organizations and well-established sales forces. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors, either alone or with collaborative partners, may succeed in developing, acquiring or licensing on an exclusive basis drug or biologic products that are more effective, safer,

more easily commercialized or less costly than our product candidates or may develop proprietary technologies or secure patent protection that we may need for the development of our technologies and products. We believe the key competitive factors that will affect the development and commercial success of our product candidates are efficacy, safety, tolerability, reliability, convenience of use, price and reimbursement.

Our competitors include companies focused on developing technologies to improve the distinct steps of bone marrow transplant.

Competitors in our stem cell expansion programs include: Gamida Cell Ltd., Nohla Therapeutics, Inc., ExCellThera Inc., Angiocrine Bioscience, Inc. and Intellia Therapeutics, Inc. In particular, Intellia Therapeutics, Inc. has exclusively licensed from Novartis the AHR antagonist that we use to manufacture MGTA-456 for expansion of gene-modified HSCs only, and it is likely that the programs developed under this license would compete directly with our E478 program.

We also face competition in our conditioning programs from Actinium Pharmaceuticals, Inc., Stanford University, Forty Seven, Inc. and Molecular Templates, Inc., and in our post-transplant complications program (GvHD) from Bellicum Pharmaceuticals, Inc., Kiadis Pharma NV and Abbvie Inc. Additionally, BioLineRx Ltd. is a competitor in our mobilization program.

In addition, we anticipate competing with the largest pharmaceutical companies in the world, such as Novartis, which is currently conducting research relating to expansion of HSCs that have been modified using CRISPR/Cas9 technology to express therapeutic proteins and delivered to patients for the treatment of potential treatment of blood disorders or primary immune deficiencies, which has greater financial and human resources than we currently have.

Even if we obtain regulatory approval of our product candidates, the availability and price of our competitors' products could limit the demand and the price we are able to charge for our product candidates. We may not be able to implement our business plan if the acceptance of our product candidates is inhibited by price competition or the reluctance of physicians to switch from existing methods of treatment to our product candidates, or if physicians switch to other new drug or biologic products or choose to reserve our product candidates for use in limited circumstances. For additional information regarding our competition, see "Business—Competition."

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials, which could cause an interruption of our commercialization efforts, research and development efforts and business operations, environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products. Although we believe that the safety procedures utilized by our third-party manufacturers for handling and disposing of these materials generally comply with the standards prescribed by these laws and regulations, we cannot guarantee that this is the case or eliminate the risk of accidental contamination or injury from these materials. In such an event, we may be held liable for any resulting damages and such liability could exceed our resources and state or federal or other applicable authorities may curtail our use of certain materials and/or interrupt our business operations. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may

impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions. We do not currently carry biological or hazardous waste insurance coverage.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities.

We may not be successful in our efforts to identify additional product candidates. Due to our limited resources and access to capital, we must prioritize development of certain product candidates; these decisions may prove to be wrong and may adversely affect our business.

Although we intend to explore other therapeutic opportunities, in addition to the product candidates that we are currently developing, we may fail to identify successful product candidates for clinical development for a number of reasons. If we fail to identify additional potential product candidates, our business could be materially harmed.

Research programs to pursue the development of our planned product candidates for additional indications and to identify new product candidates and disease targets require substantial technical, financial and human resources whether or not they are ultimately successful. Our research programs may initially show promise in identifying potential indications and/or product candidates, yet fail to yield results for clinical development for a number of reasons, including:

- the research methodology used may not be successful in identifying potential indications and/or product candidates;
- potential product candidates may, after further study, be shown to have harmful adverse effects or other characteristics that indicate they are unlikely to be effective drugs; or
- it may take greater human and financial resources than we will possess to identify additional therapeutic opportunities for our product candidates or to develop suitable potential product candidates through internal research programs, thereby limiting our ability to develop, diversify and expand our product portfolio.

Because we have limited financial and human resources, we intend to initially focus on research programs and product candidates for a limited set of indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential or a greater likelihood of success. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities.

Accordingly, there can be no assurance that we will ever be able to identify additional therapeutic opportunities for our product candidates or to develop suitable potential product candidates through internal research programs, which could materially adversely affect our future growth and prospects. We may focus our efforts and resources on potential product candidates or other potential programs that ultimately prove to be unsuccessful.

Risks Related to Our Common Stock and This Offering

An active trading market for our common stock may not develop or be sustainable. If an active trading market does not develop, investors may not be able to resell their shares at or above the initial public offering price and our ability to raise capital in the future may be impaired.

Prior to this offering, there has been no public market for our common stock. The initial public offering price for our common stock will be determined through negotiations with the underwriters. This price may not reflect the price at which investors in the market will be willing to buy and sell our shares following this offering. Although we intend to list our common stock on The NASDAQ Global Market, an active trading market for our shares may never develop or, if developed, be maintained following this offering. If an active market for our common stock does not develop or is not maintained, it may be difficult for you to sell shares you purchase in this offering without depressing the market price for the shares or at all. An inactive trading market may also impair our ability to raise capital to continue to fund operations by selling shares and may impair our ability to acquire other companies or technologies by using our shares as consideration.

If you purchase shares of common stock in this offering, you will suffer immediate dilution in the net tangible book value of your investment.

The initial public offering price of our common stock is substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. Based on the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, you will experience immediate dilution of $ per share, representing the difference between our pro forma net tangible book value per share after giving effect to this offering and the assumed initial public offering price. Purchasers of common stock in this offering will have contributed approximately % of the aggregate price paid by all purchasers of our capital stock and will own approximately % of our common stock outstanding after this offering, excluding any shares of our common stock that they may have acquired prior to this offering. Furthermore, if the underwriters exercise their over-allotment option or our previously issued options and other rights to acquire common stock at prices below the assumed initial public offering price are exercised, you will experience further dilution. For additional information on the dilution that you will experience immediately after this offering, see the section titled “Dilution.”

The trading price of our common stock is likely to be highly volatile, which could result in substantial losses for purchasers of our common stock in this offering. Securities class action or other litigation involving our company or members of our management team could also substantially harm our business, financial condition and results of operations.

Our stock price is likely to be highly volatile. The stock market in general and the market for smaller pharmaceutical and biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your common stock at or above the initial public offering price and you may lose some or all of your investment. The market price for our common stock may be influenced by many factors, including:

- the success of existing or new competitive products or technologies;
- regulatory actions with respect to our product candidates or our competitors’ products and product candidates;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- the timing and results of preclinical studies for any of our product candidates;
- the timing and results of clinical trials of MGTA-456 and any other product candidates;
- commencement or termination of collaborations for E478 or any of our current and future programs and product candidates;
- failure or discontinuation of any of our development programs;
- results of clinical trials of product candidates of our competitors;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- the results of our efforts to develop additional product candidates or products;
- actual or anticipated changes in estimates as to financial results or development timelines;

- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders or other stockholders;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in estimates or recommendations by securities analysts, if any, that cover us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this "Risk Factors" section.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for biopharmaceutical companies, which have experienced significant stock price volatility in recent years.

We have broad discretion in the use of the net proceeds from this offering and may invest or spend the proceeds in ways with which you do not agree and in ways that may not yield a return on your investment.

Although we currently intend to use the net proceeds from this offering in the manner described in the section titled "Use of Proceeds" in this prospectus, our management will have broad discretion in the application of the net proceeds from this offering and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. You will not have the opportunity to influence our decisions on how to use the net proceeds from this offering. The failure by our management to apply these funds effectively could result in financial losses that could harm our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value.

We are an "emerging growth company," and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an emerging growth company, as defined in the Jumpstart Our Business Startups Act, or the JOBS Act, enacted in April 2012. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended, or the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements and exemptions from the requirements of holding nonbinding advisory votes on executive compensation and stockholder approval of any golden parachute payments not previously approved. We could be an emerging growth company for up to five years following the year in which we complete this offering, although circumstances could cause us to lose that status earlier. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of this offering, (b) in which we have total annual gross revenue of at least $1.07 billion or (c) in which we are deemed to be a large accelerated filer, which requires the market value of our common stock that is held by non-affiliates to exceed $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company" which would allow us to take advantage of many of the same exemptions from disclosure requirements including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

Under the JOBS Act, emerging growth companies can also delay adopting new or revised accounting standards until such time as those standards apply to private companies. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. We are considering whether to "opt out" of this provision and thereby comply with new or revised accounting standards as required when they are adopted. If we do decide to "opt out," this decision to "opt out" of the extended transition period under the JOBS Act is irrevocable. As a result, changes in rules of U.S. generally accepted accounting principles or their interpretation, the adoption of new guidance or the application of existing guidance to changes in our business could significantly affect our financial position and results of operations.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives and corporate governance practices.

As a public company, and particularly after we are no longer an "emerging growth company," we will incur significant legal, accounting and other expenses that we did not incur as a private company, including costs associated with public company reporting requirements. We also anticipate that we will incur costs associated with relatively recently adopted corporate governance requirements, including requirements of the SEC, and The NASDAQ Global Market. We expect these rules and regulations to increase our legal and financial compliance costs and to make some activities more time-consuming and costly. We also expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be more difficult for us to attract and retain qualified individuals to serve on our board of directors or as executive officers.

We are currently evaluating and monitoring developments with respect to these rules, and we cannot predict or estimate the amount of additional costs we may incur or the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

Pursuant to Section 404 of the Sarbanes-Oxley Act, or Section 404, we will be required to furnish a report by our management on our internal control over financial reporting beginning with our second filing of an Annual Report on Form 10-K with the SEC after we become a public company. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude, within the prescribed timeframe or at all, that our internal control over financial reporting is effective as required by Section 404. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

Sales of a substantial number of shares of our common stock by our existing stockholders in the public market could cause our stock price to fall.

If our existing stockholders sell, or indicate an intention to sell, substantial amounts of our common stock in the public market after the lock-up and other legal restrictions on resale discussed in this prospectus lapse, the trading price of our common stock could decline. Based on shares of common stock outstanding as of February 28, 2018, upon the closing of this offering we will have outstanding a total of shares of common stock. Of these shares, only the shares of common stock sold in this offering by us, plus any shares sold upon exercise of the underwriters' option to purchase additional shares, will be freely tradable without restriction in the public market immediately following this offering. J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, however, may, in their sole discretion, permit our officers, directors and other stockholders who are subject to these lock-up agreements to sell shares prior to the expiration of the lock-up agreements.

We expect that the lock-up agreements pertaining to this offering will expire 180 days from the date of this prospectus. In addition, shares of common stock that are either subject to outstanding options or reserved for future issuance under our 2018 Stock Option and Incentive Plan, as amended, will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

After this offering, the holders of shares of our common stock as of February 28, 2018 will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to the 180-day lock-up agreements described above. See "Description of Capital Stock—Registration Rights." Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

We do not anticipate paying any cash dividends on our capital stock in the foreseeable future. Accordingly, stockholders must rely on capital appreciation, if any, for any return on their investment.

We have never declared nor paid cash dividends on our capital stock. We currently plan to retain all of our future earnings, if any, to finance the operation, development and growth of our business. In addition, the terms of any future debt or credit agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

Concentration of ownership of our common stock among our existing executive officers, directors and principal stockholders may prevent new investors from influencing significant corporate decisions.

Based upon shares outstanding as of February 28, 2018, and after giving effect to the conversion of all outstanding shares of preferred stock into shares of our common stock, upon the closing of this offering, our executive officers and directors, combined with our stockholders who owned more than 5% of our outstanding common stock before this offering and their affiliates, will, in the aggregate, beneficially own shares representing approximately % of our common stock. This concentration of ownership control may:

- delay, defer or prevent a change in control;
- entrench our management or the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other stockholders may desire.

Some of these persons or entities may have interests different than yours. For example, because many of these stockholders purchased their shares at prices substantially below the price at which shares are being sold in this offering and have held their shares for a longer period, they may be more interested in selling our company to an acquirer than other investors or they may want us to pursue strategies that deviate from the interests of other stockholders.

Provisions in our corporate charter documents and under Delaware law may prevent or frustrate attempts by our stockholders to change our management or hinder efforts to acquire a controlling interest in us.

Provisions in our corporate charter and our bylaws that will become effective upon the closing of this offering may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions:

- establish a classified board of directors such that all members of the board are not elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;
- limit the manner in which stockholders can remove directors from the board;
- establish advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted on at stockholder meetings;
- require that stockholder actions must be effected at a duly called stockholder meeting and prohibit actions by our stockholders by written consent;
- limit who may call a special meeting of stockholders;
- authorize our board of directors to issue preferred stock without stockholder approval, which could be used to institute a "poison pill" that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our board of directors; and
- require the approval of the holders of at least % of the votes that all our stockholders would be entitled to cast to amend or repeal certain provisions of our charter or bylaws.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner. This could discourage, delay or prevent someone from acquiring us or merging with us, whether or not it is desired by, or beneficial to, our stockholders. This could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests. These provisions may also prevent changes in our management or limit the price that investors are willing to pay for our stock.

Our amended and restated certificate of incorporation will provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or agents.

Our amended and restated certificate of incorporation, which will become effective upon the closing of this offering, specifies that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions involving claims brought against us by stockholders. Any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our amended and restated certificate of incorporation described above.

We believe this provision benefits us by providing increased consistency in the application of Delaware law by chancellors particularly experienced in resolving corporate disputes, efficient administration of cases on a more expedited schedule relative to other forums and protection against the burdens of multi-forum litigation. However, the provision may have the effect of discouraging lawsuits against our directors, officers, employees and agents as it may limit any stockholder's ability to bring a claim in a judicial forum that such stockholder finds favorable for disputes with us or our directors, officers, employees or agents. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against us, a court could find the choice of forum provisions contained in our restated certificate of incorporation to be inapplicable or unenforceable in such action. If a court were to find the choice of forum provision contained in our restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business, financial condition or results of operations.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our share price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. We do not currently have and may never obtain research coverage by securities and industry analysts. If no or few securities or industry analysts commence coverage of us, or one or more of the analysts who cover us issues an adverse opinion about our company, our stock price would likely decline. If one or more of these analysts ceases research coverage of us or fails to regularly publish reports on us, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the sections entitled “Prospectus Summary,” “Risk Factors,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Business,” contains forward-looking statements that are based on our management’s belief and assumptions and on information currently available to our management. Although we believe that the expectations reflected in these forward-looking statements are reasonable, these statements relate to our strategy, future operations, future financial position, future revenue, projected costs, prospects, plans, objectives of management and expected market growth, and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. Forward-looking statements in this prospectus include, but are not limited to, statements about:

- our expected uses of the net proceeds to us from this offering;
- the timing and the success of clinical trials of MGTA-456 and any other product candidates;
- the outcomes of our preclinical studies, including under our C200 program;
- our ability to enroll patients in our clinical trials at the pace that we project;
- whether the results of our trials will be sufficient to support domestic or foreign regulatory approvals for MGTA-456 or any other product candidates we may develop;
- regulatory actions with respect to our product candidates or our competitors’ products and product candidates;
- our ability to obtain, including on an expedited basis, and maintain regulatory approval of MGTA-456 or any other product candidates we may develop;
- the level of expenses related to any of our product candidates or clinical development programs;
- our expectation that our existing capital resources and the net proceeds from this offering will be sufficient to enable us to fund our planned development of MGTA-456 and any other product candidates we may identify and pursue;
- the benefits of the use of MGTA-456 or any other product candidate, if approved;
- our ability to successfully commercialize MGTA-456 or any other product candidates we may identify and pursue, if approved;
- our ability to successfully find collaborators for E478 or any of our current and future programs and product candidates;
- the rate and degree of market acceptance of MGTA-456 or any other product candidates we may identify and pursue;
- our ability to obtain orphan drug designation for any of our product candidates we may identify;
- our expectations regarding government and third-party payor coverage and reimbursement;
- our ability to manufacture MGTA-456 or any other product candidate in conformity with the Food and Drug Administration’s requirements and to scale up manufacturing of our product candidates to commercial scale, if approved;
- our ability to successfully build a specialty sales force and commercial infrastructure;
- our ability to compete with companies currently producing or engaged in the clinical development of treatments for the disease indications that we pursue and treatment modalities that we develop;
- our reliance on third parties to conduct our clinical trials;
- our reliance on third-party contract manufacturers to manufacture and supply our product candidates for us;
- our ability to retain and recruit key personnel;

- our ability to obtain and maintain intellectual property protection for MGTA-456 or any other product candidates we may identify and pursue;
- our estimates of our expenses, ongoing losses, future revenue, capital requirements and our needs for or ability to obtain additional financing;
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act;
- our financial performance; and
- developments and projections relating to our competitors or our industry.

In some cases, you can identify forward-looking statements by terminology such as “may,” “will,” “could”, “should,” “expects,” “intends,” “plans,” “anticipates,” “believes,” “estimates,” “predicts,” “projects”, “potential,” “continue” or the negative of these terms or other comparable terminology. These statements are only predictions. You should not place undue reliance on forward-looking statements because they involve known and unknown risks, uncertainties and other factors, which are, in some cases, beyond our control and which could materially affect results. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under “Risk Factors” and elsewhere in this prospectus. If one or more of these risks or uncertainties occur, or if our underlying assumptions prove to be incorrect, actual events or results may vary significantly from those implied or projected by the forward-looking statements. No forward-looking statement is a guarantee of future performance. You should read this prospectus and the documents that we reference in this prospectus and have filed with the SEC as exhibits to the registration statement, of which this prospectus is a part, completely and with the understanding that our actual future results may be materially different from any future results expressed or implied by these forward-looking statements.

The forward-looking statements in this prospectus represent our views as of the date of this prospectus. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we assume no obligation to update or revise any forward-looking statements except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this prospectus.

This prospectus also contains estimates, projections and other information concerning our industry, our business, and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market and other data from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data and similar sources.

USE OF PROCEEDS

We estimate that our net proceeds from the sale of shares of our common stock in this offering will be approximately $ million, or $ million if the underwriters exercise in full their option to purchase additional shares, assuming an initial public offering price of $ per share, the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share, the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by $ million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) our net proceeds from this offering by $ million, assuming no change in the assumed initial public offering price per share and after deducting underwriting discounts and commissions and estimated offering expenses payable by us.

We intend to use the net proceeds from this offering and our cash and cash equivalents on hand as follows:

- approximately $ million to $ million to fund the development of our conditioning program and product candidates, including IND-enabling studies through the start of a first-in-human study;
- approximately $ million to $ million to fund the development of MGTA-456, including the completion of our ongoing Phase II clinical trial, planned additional clinical trials in indications beyond inherited metabolic diseases, through the initiation of a pivotal clinical trial, and planned expansion to our late-stage clinical and early commercial manufacturing capabilities through third parties;
- approximately $ million to $ million to fund the development of MGTA-145, our mobilization product candidate, including a first-in-human study and proof-of-concept trial; and
- the remaining proceeds, if any, to fund new and ongoing research and development activities, our new product engine, working capital and other general corporate purposes, which may include funding for the hiring of additional personnel, capital expenditures and the costs of operating as a public company.

Based on our current plans, we believe our cash and cash equivalents, together with the net proceeds to us from this offering, will be sufficient to fund our operations through .

We may also use a portion of the net proceeds to in-license, acquire or invest in new businesses, technology or assets. Although we have no specific agreements, commitments or understandings with respect to any in-license or acquisition, we evaluate such opportunities and engage in related discussions with other companies from time to time.

This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above. The amounts and timing of our actual expenditures and the extent of our preclinical and clinical development activities may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from preclinical studies and our ongoing clinical trial or any clinical trials we may commence in the future, our ability to take advantage of expedited programs or to obtain regulatory approval for MGTA-456 and any other product candidates we may identify and pursue, the timing and costs associated with the manufacture and supply of MGTA-456 and any other product candidates we may identify and pursue for clinical development or commercialization, and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering.

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term, investment-grade, interest-bearing instruments and U.S. government securities.

DIVIDEND POLICY

We have never declared or paid dividends on our capital stock. We do not anticipate paying any dividends on our capital stock in the foreseeable future. We currently intend to retain all available funds and any future earnings to fund the development and growth of our business. Any future determination to declare dividends will be subject to the discretion of our board of directors and will depend on various factors, including applicable laws, our results of operations, financial condition, future prospects and any other factors deemed relevant by our board of directors. Investors should not purchase our common stock with the expectation of receiving cash dividends.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and our capitalization as of December 31, 2017:

- on an actual basis;
- on a pro forma basis to give effect to:
  - the automatic conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of 49,178,527 shares of our common stock upon the closing of this offering; and
  - the filing and effectiveness of our amended and restated certificate of incorporation; and
- on a pro forma as adjusted basis to give further effect to our issuance and sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma as adjusted information below is illustrative only, and our capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this table together with our financial statements and the related notes appearing at the end of this prospectus and the sections of this prospectus titled “Selected Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

	At December 31, 2017		
	Actual	Pro Forma	Pro Forma As Adjusted
	(In thousands, except share and per share data)		
Cash and cash equivalents	$ 51,402	$ 51,402	
Redeemable convertible preferred stock (Series A and B), $0.001 par value; 49,178,527 shares authorized, issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	92,439	—	
Stockholders’ Equity (Deficit)			
Preferred stock, par value; no shares authorized, issued or outstanding, actual; shares authorized and no shares issued or outstanding, pro forma and pro forma as adjusted	—	—	
Common stock, $0.001 par value; 70,000,000 shares authorized, 11,520,853 shares issued and 6,075,577 outstanding, actual; shares authorized, 60,699,380 shares issued and 55,254,104 shares outstanding, pro forma; shares authorized, shares issued and shares outstanding, pro forma as adjusted	6	55	
Additional paid-in capital	3,087	95,477	
Accumulated deficit	(45,211)	(45,211)	
Total stockholders’ equity (deficit)	(42,118)	50,321	
Total capitalization	$ 50,321	$ 50,321	

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, total stockholders’ equity and total capitalization by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of

this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, total stockholders' equity and total capitalization by $ million, assuming no change in the assumed initial public offering price per share and after deducting estimated underwriting discounts and commissions.

The table above does not include:

- 1,613,500 shares of common stock issuable upon the exercise of stock options outstanding as of December 31, 2017 under the 2016 Plan at a weighted average exercise price of $1.87 per share;
- 4,538,087 shares of common stock reserved and available for future issuance under the 2016 Plan, as of December 31, 2017; and
- shares of our common stock reserved for future issuance under our 2018 Plan, which will become effective upon the completion of this offering, as well as any future increases in the number of shares of common stock reserved for future increases in the number of shares of common stock reserved for future issuances under our 2018 Plan.

DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted immediately to the extent of the difference between the initial public offering price per share of our common stock and the pro forma as adjusted net tangible book value per share of our common stock immediately after this offering.

Our historical net tangible book value (deficit) as of December 31, 2017 was $(42.1) million, or $(3.66) per share of our common stock. Our historical net tangible book value (deficit) is the amount of our total tangible assets less our total liabilities and preferred stock, which is not included within our stockholders' equity (deficit). Historical net tangible book value per share represents historical net tangible book value (deficit) divided by the 11,520,853 shares of our common stock outstanding as of December 31, 2017, including 5,445,276 shares of unvested restricted stock subject to repurchase by us.

Our pro forma net tangible book value as of December 31, 2017 was $50.3 million, or $0.83 per share of our common stock. Pro forma net tangible book value represents the amount of our total tangible assets less our total liabilities, after giving effect to the automatic conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of 49,178,527 shares of our common stock upon the closing of this offering. Pro forma net tangible book value per share represents pro forma net tangible book value divided by the total number of shares outstanding as of December 31, 2017 after giving effect to the pro forma adjustment described above.

After giving further effect to our issuance and sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of December 31, 2017 would have been $ million, or $ per share. This represents an immediate increase in pro forma as adjusted net tangible book value per share of $ to existing stockholders and immediate dilution of $ per share in pro forma as adjusted net tangible book value per share to new investors purchasing common stock in this offering. Dilution per share to new investors is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the assumed initial public offering price per share paid by new investors. The following table illustrates this dilution on a per share basis:

Assumed initial public offering price per share		$
Historical net tangible book value (deficit) per share as of December 31, 2017	$(3.66)	
Increase per share attributable to the pro forma adjustment described above	4.49	
Pro forma net tangible book value per share as of December 31, 2017	$ 0.83	
Increase in pro forma as adjusted net tangible book value per share attributable to new investors purchasing common stock in this offering		
Pro forma as adjusted net tangible book value per share after this offering		
Dilution per share to new investors purchasing common stock in this offering		$

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) our pro forma as adjusted net tangible book value per share after this offering by $ and dilution per share to new investors purchasing common stock in this offering by $, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase our pro forma as adjusted net tangible book value per share

after this offering by $ and decrease the dilution per share to new investors purchasing common stock in this offering by $, assuming no change in the assumed initial public offering price per share and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. A decrease of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would decrease our pro forma as adjusted net tangible book value per share after this offering by $ and increase the dilution per share to new investors purchasing common stock in this offering by $, assuming no change in the assumed initial public offering price and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters fully exercise their option to purchase additional shares of common stock in this offering, our pro forma as adjusted net tangible book value per share after this offering would be $ and the dilution in pro forma as adjusted net tangible book value per share to new investors purchasing common stock in this offering would be $, assuming no change in the initial public offering price per share and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The following table summarizes, as of December 31, 2017, on the pro forma as adjusted basis described above, the total number of shares of common stock purchased from us on an as converted to common stock basis, the total consideration paid, or to be paid, and the average price per share paid or to be paid by existing shareholders and by new investors in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, before deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. As the table shows, new investors purchasing common stock in this offering will pay an average price per share substantially higher than our existing stockholders paid.

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	Percent	Amount	Percentage	
Existing stockholders		%	$	%	$
New investors					$
Total		100%	$	100%	

A $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming no change in the assumed initial public offering price per share.

The table above assumes no exercise of the underwriters' option to purchase additional shares in this offering. If the underwriters' option to purchase additional shares is fully exercised, the number of shares of our common stock held by existing stockholders would be reduced to % of the total number of shares of our common stock outstanding after this offering, and the number of shares of common stock held by new investors purchasing common stock in this offering would be increased to % of the total number of shares of our common stock outstanding after this offering.

The number of shares of common stock to be outstanding after this offering is based on 60,699,380 shares of common stock outstanding as of December 31, 2017, which includes 5,445,276 shares of unvested restricted

stock subject to repurchase by us, after giving effect to the automatic conversion of all outstanding shares of our preferred stock and excludes:

- 1,613,500 shares of common stock issuable upon the exercise of stock options outstanding as of December 31, 2017 under the 2016 Plan, at a weighted average exercise price of $1.87 per share;
- 4,538,087 shares of common stock reserved and available for future issuance under the 2016 Plan, as of December 31, 2017; and
- shares of our common stock reserved for future issuance under our 2018 Plan, which will become effective upon the completion of this offering, as well as any future increases in the number of shares of common stock reserved for future increases in the number of shares of common stock reserved for future issuances under our 2018 Plan.

If additional shares are issued in connection with the exercise of outstanding options, if new stock options are issued under our equity incentive plan, or if we issue additional shares of common stock in the future, there will be further dilution to investors purchasing common stock in this offering. In addition, we may choose to raise additional capital because of market conditions or strategic considerations, even if we believe that we have sufficient funds for our current or future operating plans. If we raise additional capital through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

SELECTED FINANCIAL DATA

You should read the following selected financial data together with our financial statements and the related notes appearing at the end of this prospectus and the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of this prospectus. We have derived the statement of operations data for the years ended December 31, 2016 and 2017 and the balance sheet data as of December 31, 2016 and 2017 from our audited financial statements appearing at the end of this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future.

	Year Ended December 31,	
	2016	2017
	(in thousands, except share and per share data)	
Statement of Operations Data:		
Revenue	$ —	$ —
Operating expenses:		
Research and development	5,782	27,899
General and administrative	3,486	7,828
Total operating expenses	9,268	35,727
Loss from operations	(9,268)	(35,727)
Other income (expense):		
Interest expense	(163)	—
Interest and other income, net	—	236
Total other income (expense), net	(163)	236
Net loss	$ (9,431)	$ (35,491)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634
Net loss attributable to common stockholders	$ (9,735)	$ (35,507)
Net loss per share attributable to common stockholders—basic and diluted	$ (25.21)	$ (7.40)
Weighted average common shares outstanding—basic and diluted	386,083	4,798,213
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)		$ (0.80)
Pro forma weighted average common shares outstanding—basic and diluted (unaudited)		44,294,374

	December 31,	
	2016	2017
	(in thousands)	
Balance Sheet Data:		
Cash and cash equivalents	$ 4,513	$ 51,402
Working capital[(1)]	8,534	48,361
Total assets	11,342	54,463
Redeemable convertible preferred stock	17,916	92,439
Total stockholders' deficit	(8,874)	(42,118)

(1) We define working capital as current assets less current liabilities.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with the section entitled "Selected Financial Data" and our financial statements and related notes appearing at the end of this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the "Risk Factors" section of this prospectus, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients. Transplant is a well-established and often curative medical procedure, and emerging data on stem cell gene therapy, which is bone marrow transplant using gene-modified stem cells, suggest the potential for meaningful benefit with this newer form of transplant. Bone marrow transplant and stem cell gene therapies use the same widely-adopted decades old transplant process. As it exists today, bone marrow transplant is a large market opportunity, and improvements to the current approaches could extend bone marrow transplant to more patients. The ability to treat patients with a bone marrow transplant is limited by the challenge of obtaining sufficient cells to perform the procedure, the inherent morbidity and mortality of current methods used to prepare patients for transplant, and complications following transplant.

At Magenta, we believe we are uniquely positioned to overcome these challenges and to lead a new era in transplant medicine. Our portfolio of product candidates includes biologics, small molecules and a cell therapy designed to address deficiencies in existing approaches and extend the curative power of bone marrow transplant to more patients across many diseases. Currently, only a fraction of eligible patients with these diseases receive a transplant because the risks and challenges outweigh the potential for a cure. These include diseases where bone marrow transplant is a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and autoimmune diseases. Emerging clinical data suggest that bone marrow transplant may represent a breakthrough approach with curative potential for patients with severe autoimmune diseases. For example, recent results from multiple clinical trials show that patients with autoimmune diseases, including multiple sclerosis and scleroderma, can be cured with a transplant. However, based on our epidemiology analyses, currently only approximately 1 to 2% of eligible patients with multiple sclerosis or scleroderma in the United States and Europe receive a bone marrow transplant.

To address the major unmet medical needs in the existing bone marrow transplant process, we are developing a stem cell biology discovery platform and building a comprehensive portfolio of first-in-class therapeutics. Our programs will improve stem cell dose (expansion), stem cell collection (mobilization), patient preparation for transplant (conditioning) and potential post-transplant complications, to address key limitations of the bone marrow transplant process to allow more patients to benefit. Within our expansion program, MGTA-456, our most advanced clinical product candidate, is a cell therapy that has achieved clinical proof of concept in 36 patients with blood cancers and is now being studied in patients with fatal inherited metabolic diseases. MGTA-456 is produced by significantly expanding the number of stem cells in cord blood units, and has the potential to allow product candidate more patients to have a better chance for a successful stem cell transplant. Within our mobilization program, MGTA-145 is focused on enabling physicians to more easily harvest a greater number of blood stem cells, known as hematopoietic stem cells or HSCs, from patients and donors to improve patient outcomes. Our targeted transplant conditioning programs, which prepare the patient for transplant, are designed to selectively remove stem and/or immune cells from a patient prior to transplant, and to be far less

toxic than the decades-old radiation and chemotherapy-based approaches which are still the only available options. Our post-transplant complications program is designed to target the donor immune cells within the patient that cause Graft vs. Host Disease, or GvHD, which can be a fatal complication of transplant.

We intend to become a fully integrated discovery, development and commercial company in the field of transplant medicine. We believe that our product portfolio will offer significant commercial synergies. We are developing our products so that they can each be used individually or in combination with each other. As a result, our portfolio could be utilized in a manner tailored to the patient's disease, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.

Since our inception in 2015, we have focused substantially all of our efforts and financial resources on organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying potential product candidates, and undertaking preclinical studies, and in the case of MGTA-456, clinical trials. We do not have any products approved for sale and have not generated any revenue from product sales. To date, we have funded our operations primarily with proceeds from the sales of redeemable convertible preferred stock and issuance of convertible notes. Through December 31, 2017, we had received net proceeds of $82.7 million from sales of our redeemable convertible preferred stock (including proceeds from convertible notes, which converted into redeemable convertible preferred stock in 2016).

Since our inception, we have incurred significant operating losses. Our ability to generate product revenue sufficient to achieve profitability will depend heavily on the successful development and eventual commercialization of one or more of our product candidates. Our net loss was $9.4 million for the year ended December 31, 2016 and $35.5 million for the year ended December 31, 2017. As of December 31, 2017, we had an accumulated deficit of $45.2 million. We expect to continue to incur significant expenses and increasing operating losses for at least the next several years. We expect our expenses and capital requirements will increase substantially in connection with our ongoing activities, particularly as we:

- continue enrollment in our Phase II clinical trial of MGTA-456;
- prepare for and initiate our preclinical studies and clinical trials of our product candidates;
- develop any other future product candidates we may choose to pursue;
- continue research and development and drug discovery and initiate additional clinical trials;
- seek marketing approval for any of our product candidates that successfully complete clinical development;
- maintain compliance with applicable regulatory requirements;
- develop and scale up our capabilities to support our ongoing preclinical activities and clinical trials for our product candidates and commercialization of any of our product candidates for which we obtain marketing approval;
- maintain, expand, protect and enforce our intellectual property portfolio;
- develop and expand our sales, marketing and distribution capabilities for our product candidates for which we obtain marketing approval, if any; and
- expand our operational, financial and management systems and increase personnel, including to support our clinical development and commercialization efforts and our operations as a public company.

We will not generate revenue from product sales unless and until we successfully complete clinical development and obtain regulatory approval for our product candidates. If we obtain regulatory approval for any of our product candidates, we expect to incur significant expenses related to developing our commercialization capability to support product sales, marketing and distribution. Further, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company.

As a result, we will need substantial additional funding to support our continuing operations and pursue our growth strategy. Until such time as we can generate significant revenue from product sales, if ever, we expect to

finance our operations through a combination of equity offerings, debt financings, collaborations, strategic alliances and marketing, distribution or licensing arrangements. We may be unable to raise additional funds or enter into such other agreements or arrangements when needed on favorable terms, or at all. If we fail to raise capital or enter into such agreements as, and when, needed, we may have to significantly delay, scale back or discontinue the development and commercialization of one or more of our product candidates.

Because of the numerous risks and uncertainties associated with pharmaceutical product development, we are unable to accurately predict the timing or amount of increased expenses or when or if we will be able to achieve or maintain profitability. Even if we are able to generate product sales, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on a continuing basis, then we may be unable to continue our operations at planned levels and be forced to reduce or terminate our operations.

As of December 31, 2017, we had cash and cash equivalents of $51.4 million. We believe that the net proceeds from this offering, together with our existing cash and cash equivalents, will enable us to fund our operating expenses and capital expenditure requirements through . See "— Liquidity and Capital Resources."

Components of Our Results of Operations

Revenue

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from the sale of products in the foreseeable future. If our development efforts for our product candidates are successful and result in regulatory approval, we may generate revenue in the future from product sales. If we enter into license or collaboration agreements for any of our product candidates or intellectual property, we may generate revenue in the future from payments as a result of such license or collaboration agreements. We cannot predict if, when, or to what extent we will generate revenue from the commercialization and sale of our product candidates. We may never succeed in obtaining regulatory approval for any of our product candidates.

Operating Expenses

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for our research activities, including our drug discovery efforts, and the development of our product candidates, which include:

- employee-related expenses, including salaries and related costs, and stock-based compensation expense, for employees engaged in research and development functions;
- expenses incurred in connection with the preclinical and clinical development of our product candidates, including under agreements with contract research organizations, or CROs;
- the cost of consultants and contract manufacturing organizations, or CMOs, that manufacture drug products for use in our preclinical studies and clinical trials;
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance and supplies; and
- payments made under third-party licensing agreements.

We expense research and development costs to operations as incurred. Advance payments for goods or services to be received in the future for use in research and development activities are recorded as prepaid expenses. The prepaid amounts are expensed as the related goods are delivered or the services are performed.

Our direct research and development expenses are tracked on a program-by-program basis and consist primarily of external costs, such as fees paid to consultants, central laboratories, contractors, CMOs and CROs in

connection with our preclinical and clinical development activities. We do not allocate employee costs, costs associated with our platform technology or facility expenses, including depreciation or other indirect costs, to specific product development programs because these costs are deployed across multiple product development programs and, as such, are not separately classified.

The table below summarizes our research and development expenses incurred by development program:

	Year Ended December 31,	
	2016	2017
	(in thousands)	
Conditioning	$ 303	$ 6,259
Mobilization	431	1,416
Expansion	13	11,045
Unallocated expenses	5,035	9,179
Total research and development expenses	$ 5,782	$27,899

The successful development and commercialization of our product candidates is highly uncertain. This is due to the numerous risks and uncertainties, including the following:

- successful completion of preclinical studies and clinical trials;
- receipt and related terms of marketing approvals from applicable regulatory authorities;
- raising additional funds necessary to complete clinical development of and commercialize our product candidates;
- obtaining and maintaining patent, trade secret and other intellectual property protection and regulatory exclusivity for our product candidates;
- making arrangements with third-party manufacturers, or establishing manufacturing capabilities, for both clinical and commercial supplies of our product candidates;
- developing and implementing marketing and reimbursement strategies;
- establishing sales, marketing and distribution capabilities and launching commercial sales of our products, if and when approved, whether alone or in collaboration with others;
- acceptance of our products, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- obtaining and maintaining third-party coverage and adequate reimbursement;
- protecting and enforcing our rights in our intellectual property portfolio; and
- maintaining a continued acceptable safety profile of the products following approval.

A change in the outcome of any of these variables with respect to the development of any of our product candidates would significantly change the costs and timing associated with the development of that product candidate. We may never succeed in obtaining regulatory approval for any of our product candidates.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We expect research and development costs to increase significantly for the foreseeable future as our product candidate development programs progress. However, we do not believe that it is possible at this time to accurately project total program-

specific expenses through commercialization. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related costs, and stock-based compensation, for personnel in executive, finance and administrative functions. General and administrative expenses also include direct and allocated facility-related costs as well as professional fees for legal, patent, consulting, accounting and audit services.

We anticipate that our general and administrative expenses will increase in the future as we increase our headcount to support our continued research activities and development of our product candidates. We also anticipate that we will incur increased accounting, audit, legal, regulatory, compliance, and director and officer insurance costs as well as investor and public relations expenses associated with operating as a public company.

Other Income (Expense)

Interest Expense. Interest expense consisted of interest accrued on convertible promissory notes, all of which notes and accrued interest were converted into redeemable convertible preferred stock in November 2016.

Interest and Other Income, Net. Interest and other income, net, consists of interest income and insignificant amounts of miscellaneous income and expense unrelated to our core operations.

Income Taxes

Since our inception, we have not recorded any U.S. federal or state income tax benefits for the net losses we have incurred in each year or for our earned research and development tax credits, due to our uncertainty of realizing a benefit from those items. As of December 31, 2017, we had federal and state net operating loss carryforwards of $18.7 million and $19.3 million, respectively, which begin to expire in 2035. As of December 31, 2017, we also had federal and state research and development tax credit carryforwards of $1.0 million and $0.4 million, respectively, which begin to expire in 2035 and 2030, respectively.

On December 22, 2017, the Tax Cuts and Jobs Act, or TCJA, was signed into United States law. The TCJA includes a number of changes to existing tax law, including, among other things, a permanent reduction in the federal corporate income tax rate from 35% to 21%, effective as of January 1, 2018, as well as limitation of the deduction for net operating losses to 80% of annual taxable income and elimination of net operating loss carrybacks, in each case, for losses arising in taxable years beginning after December 31, 2017 (though any such net operating losses may be carried forward indefinitely). The tax rate change resulted in (i) a reduction in the gross amount of our deferred tax assets as of December 31, 2017, without an impact on the net amount of our deferred tax assets, which are recorded with a full valuation allowance, and (ii) no income tax expense or benefit being recognized as of the enactment date of the TCJA.

Critical Accounting Policies and Significant Judgments and Estimates

Our financial statements are prepared in accordance with generally accepted accounting principles in the United States, or GAAP. The preparation of our financial statements and related disclosures requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, costs and expenses, and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events and various other factors that we believe are reasonable under the

circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in Note 2 to our financial statements appearing at the end of this prospectus, we believe that the following accounting policies are those most critical to the judgments and estimates used in the preparation of our financial statements.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued research and development expenses. This process involves reviewing open contracts and purchase orders, communicating with our applicable personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of actual costs. The majority of our service providers invoice us in arrears for services performed, on a pre-determined schedule or when contractual milestones are met; however, some require advance payments. We make estimates of our accrued expenses as of each balance sheet date in the financial statements based on facts and circumstances known to us at that time. We periodically confirm the accuracy of the estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include fees paid to:

- vendors in connection with the preclinical development activities;
- CROs in connection with preclinical and clinical trials;
- CMOs in connection with the production of preclinical and clinical trial materials; and
- investigative sites in connection with clinical trials.

We base our expenses related to preclinical studies and clinical trials on our estimates of the services received and efforts expended pursuant to quotes and contracts with multiple research institutions and CROs that conduct and manage preclinical studies and clinical trials on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from the estimate, we adjust the accrual or prepaid expense accordingly. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in reporting amounts that are too high or too low in any particular period. To date, there have not been any material adjustments to our prior estimates of accrued research and development expenses.

Determination of Fair Value of Common and Preferred Stock

As there has been no public market for our common stock to date, the estimated fair value of our common stock has been determined by our board of directors as of the date of each award grant, with input from management, considering our most recently available third-party valuations of common stock and our board of directors' assessment of additional objective and subjective factors that it believed were relevant and which may have changed from the date of the most recent valuation through the date of the grant. These third-party valuations were performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants' Accounting and Valuation Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*. Our common stock valuations were prepared using either an option pricing method, or OPM, or a hybrid method, both of which used market approaches to estimate our enterprise value. The OPM treats

common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. Under this method, the common stock has value only if the funds available for distribution to stockholders exceeded the value of the preferred stock liquidation preferences at the time of the liquidity event, such as a strategic sale or a merger. A discount for lack of marketability of the common stock is then applied to arrive at an indication of value for the common stock. The hybrid method is a probability-weighted expected return method, or PWERM, where the equity value in one or more scenarios is calculated using an OPM. The PWERM is a scenario-based methodology that estimates the fair value of common stock based upon an analysis of future values for the company, assuming various outcomes. The common stock value is based on the probability-weighted present value of expected future investment returns considering each of the possible outcomes available as well as the rights of each class of stock. The future value of the common stock under each outcome is discounted back to the valuation date at an appropriate risk-adjusted discount rate and probability weighted to arrive at an indication of value for the common stock. These third-party valuations were performed at various dates, which resulted in valuations of our common stock of $1.87 per share as of April 30, 2017 and $2.98 per share as of December 31, 2017. In addition to considering the results of these third-party valuations, our board of directors considered various objective and subjective factors to determine the fair value of our common stock as of each grant date, which may be at a date later than the most recent third-party valuation date, including:

- the prices at which we sold shares of preferred stock and the superior rights and preferences of the preferred stock relative to our common stock at the time of each grant;
- the progress of our research and development programs, including the status of preclinical studies and clinical trials for our product candidates;
- our stage of development and commercialization and our business strategy;
- external market conditions affecting the biotechnology industry, and trends within the biotechnology industry;
- our financial position, including cash on hand, and our historical and forecasted performance and operating results;
- the lack of an active public market for our common stock and our preferred stock;
- the likelihood of achieving a liquidity event, such as an initial public offering, or IPO, or a sale of our company in light of prevailing market conditions; and
- the analysis of IPOs and the market performance of similar companies in the biopharmaceutical industry.

The assumptions underlying these valuations represent management's best estimates, which involve inherent uncertainties and the application of management judgment. As a result, if factors or expected outcomes change and we use significantly different assumptions or estimates, our stock-based compensation expense could be materially different.

Following the closing of this offering, the fair value of our common stock will be determined based on the quoted market price of our common stock.

We estimated the fair value of our Series A redeemable convertible preferred stock, or Series A preferred stock, and Series B redeemable convertible preferred stock, or Series B preferred stock, as of April 30, 2017 to be $2.71 per share and $3.88 per share, respectively, using the OPM valuation method and other relevant factors as described above.

Common and Preferred Stock Issued for Licenses

When common and preferred stock are issued in exchange for a license, we determine the fair value of the common and preferred stock granted as either the fair value of the consideration received or the fair value of the

equity instruments issued. For the common and preferred stock issued for licenses during the years ended December 31, 2016 and 2017, we determined the expense based on the fair value of the stock issued as it was more readily determinable.

Stock-Based Compensation

We measure all stock options and other stock-based awards granted to employees and directors based on the fair value on the date of the grant and recognize compensation expense of those awards over the requisite service period, which is generally the vesting period of the respective award. Generally, we issue stock options and restricted stock awards, or RSAs, with service-based vesting conditions and record the expense for these awards using the straight-line method. We have historically granted stock options with exercise prices equivalent to the fair value of our common stock as of the date of the grant. We estimate the fair value of each stock option award using the Black-Scholes option-pricing model, which uses as inputs the fair value of our common stock and assumptions we make for the volatility of our common stock, the expected term of our stock options, the risk-free interest rate for a period that approximates the expected term of our stock options and our expected dividend yield and the then-current fair value of common stock for restricted stock.

We measure the fair value of stock-based awards granted to non-employees on the date at which the related service is complete. Compensation expense is recognized over the period during which services are rendered by such non-employee consultants until completed. At the end of each financial reporting period prior to completion of the service, the fair value of these awards is re-measured using the then-current fair value of our common stock and updated assumption inputs in the Black-Scholes option-pricing model for options and the then-current fair value of our common stock for restricted stock.

We do not estimate and apply a forfeiture rate as we have elected to account for forfeitures as they occur.

Grants of Stock-Based Awards

The following table sets forth by grant date the number of shares of restricted stock and shares subject to options granted between January 1, 2017 and February 28, 2018, the per share exercise price of the options, the fair value of common stock per share on each grant date, and the per share estimated fair value of the award:

Grant Date	Type of Award	Number of Shares Subject to Award	Per Share Exercise Price of Options	Fair Value of Common Stock per Share on Grant Date	Per Share Estimated Fair Value of Award
March 31, 2017	RSA	565,000	—	$ 1.87	$ 1.87
September 28, 2017	Option	1,351,000	$ 1.87	$ 1.87	$ 1.28
October 7, 2017	Option	12,500	$ 1.87	$ 1.87	$ 1.26
November 30, 2017	Option	250,000	$ 1.87	$ 1.87	$ 1.27
January 31, 2018	Option	1,969,500	$ 2.98	$ 2.98	$ 2.05

Results of Operations

Comparison of the Years Ended December 31, 2016 and 2017

The following table summarizes our results of operations for the years ended December 31, 2016 and 2017:

	Year Ended December 31,		
	2016	2017	Change
	(in thousands)		
Revenue	$ —	$ —	$ —
Operating expenses:			
Research and development	5,782	27,899	22,117
General and administrative	3,486	7,828	4,342
Total operating expenses	9,268	35,727	26,459
Loss from operations	(9,268)	(35,727)	(26,459)
Other income (expense):			
Interest expense	(163)	—	163
Interest and other income, net	—	236	236
Total other income (expense), net	(163)	236	399
Net loss	$(9,431)	$(35,491)	$(26,060)

Research and Development Expenses

	Year Ended December 31,		
	2016	2017	Change
	(in thousands)		
Direct external research and development expenses by program:			
Conditioning	$ 303	$ 6,259	$ 5,956
Mobilization	431	1,416	985
Expansion	13	11,045	11,032
Unallocated expenses:			
Personnel related (including stock-based compensation)	1,527	4,384	2,857
Consultant fees	1,442	2,364	922
Facility related and other	2,066	2,431	365
Total research and development expenses	$5,782	$27,899	$22,117

Expenses related to our conditioning program increased primarily as a result of our drug discovery efforts for target validation, lead identification and lead optimization. The increase in our mobilization program was due to an increase in preclinical costs for toxicology studies and manufacturing to support our Investigational New Drug, or IND, enabling studies. Expenses related to our expansion program increased primarily due to the cost of in-licensing technology of $9.3 million for the rights to MGTA-456 under a license agreement with Novartis. The cost of in-licensing technology was a result of the issuance of preferred stock to Novartis which was recorded at the fair value of the preferred stock issued. Expansion program costs also increased due to clinical trial costs incurred in preparation for our MGTA-456 Phase II study for inherited metabolic diseases, which we initiated in December 2017.

The increase in personnel-related costs included in unallocated expenses was due to an increase in headcount in our research and development function. Personnel-related costs for the years ended December 31,

2016 and 2017 included stock-based compensation expense of $0.1 million and $0.3 million, respectively. The increase in consultant fees was primarily due to an increase in stock-based compensation from $0.4 million for the year ended December 31, 2016 to $1.3 million for the year ended December 31, 2017. The increase in facility-related and other costs included in unallocated expenses was primarily due to rent expense under our new lease agreement for our Cambridge, Massachusetts facility, which we entered into in February 2017.

General and Administrative Expenses

	Year Ended December 31,		
	2016	2017	Change
		(in thousands)	
Personnel related (including stock-based compensation)	$1,205	$3,369	$2,164
Professional and consultant fees	1,942	3,217	1,275
Facility related and other	339	1,242	903
Total general and administrative expenses	$3,486	$7,828	$4,342

The increase in personnel-related costs was primarily a result of an increase in headcount. Personnel-related costs for the years ended December 31, 2016 and 2017 included stock-based compensation expense of $0.2 million and $0.6 million, respectively. The increase in professional and consultant fees was primarily due to an increase in legal, audit and recruiting fees related to ongoing business activities and our preparations to operate as a public company as well as an increase of $0.4 million related to market research activities. The increase in facility-related and other costs was primarily due to rent expense under our new lease agreement for our Cambridge, Massachusetts facility, which we entered into in February 2017.

Other Income (Expense)

Interest expense was $0.2 million for the year ended December 31, 2016. There was no interest expense for the year ended December 31, 2017. The decrease of $0.2 million in interest expense was due to the conversion of outstanding convertible notes into redeemable convertible preferred stock in November 2016.

There was no other income or expense for the year ended December 31, 2016. There was $0.2 million other income, net for the year ended December 31, 2017 primarily related to interest income earned on our invested cash balances.

Liquidity and Capital Resources

Since our inception, we have incurred significant operating losses. We have not yet commercialized any of our product candidates and we do not expect to generate revenue from sales of any product candidates for several years, if at all. To date, we have funded our operations primarily with proceeds from the sales of redeemable convertible preferred stock and issuance of convertible notes. Through December 31, 2017, we had received net proceeds of $82.7 million from sales of our redeemable convertible preferred stock (including proceeds from convertible notes, which converted into redeemable convertible preferred stock in November 2016). As of December 31, 2017, we had cash and cash equivalents of $51.4 million.

Cash Flows

The following table summarizes our sources and uses of cash for each of the periods presented:

	Year Ended December 31,	
	2016	2017
	(in thousands)	
Cash used in operating activities	$ (6,529)	$ (22,263)
Cash used in investing activities	(169)	(2,334)
Cash provided by financing activities	10,711	71,486
Net increase in cash and cash equivalents	$ 4,013	$ 46,889

Operating Activities

During the year ended December 31, 2016, operating activities used $6.5 million of cash, primarily resulting from our net loss of $9.4 million, partially offset by non-cash charges of $1.3 million and cash provided by changes in our operating assets and liabilities of $1.6 million. Net cash provided by changes in our operating assets and liabilities for the year ended December 31, 2016 consisted primarily of a $1.6 million increase in accounts payable and accrued expenses.

During the year ended December 31, 2017, operating activities used $22.3 million of cash, primarily resulting from our net loss of $35.5 million, partially offset by non-cash charges of $11.9 million and cash provided by changes in our operating assets and liabilities of $1.3 million. Net cash provided by changes in our operating assets and liabilities for the year ended December 31, 2017 consisted primarily of a $2.2 million increase in accounts payable and accrued expenses, partially offset by an increase of $0.9 million in prepaid expenses and other current assets.

Changes in accounts payable, accrued expenses and prepaid expenses in both periods were generally due to growth in our business and the timing of vendor invoicing and payments.

Investing Activities

During the years ended December 31, 2016 and 2017, we used $0.1 million and $2.2 million, respectively, to purchase property and equipment.

Financing Activities

During the year ended December 31, 2016, net cash provided by financing activities was $10.7 million, consisting primarily of proceeds of $6.5 million from the sale of convertible promissory notes and net proceeds of $4.2 million from the sale of Series A preferred stock that we received in 2016.

During the year ended December 31, 2017, net cash provided by financing activities was $71.5 million, consisting primarily of $6.3 million of the remaining proceeds received in January 2017 from the sale of Series A preferred stock that we recorded as other receivable as of December 31, 2016, $15.4 million of proceeds from the sale of additional shares of Series A preferred stock and $49.8 million of net proceeds received from the sale of Series B preferred stock.

Funding Requirements

We expect our expenses to increase substantially in connection with our ongoing activities, particularly as we advance the preclinical activities and clinical trials for our product candidates in development. In addition,

upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. The timing and amount of our operating expenditures will depend largely on:

- the initiation, progress, timing, costs and results of current and future preclinical studies and clinical trials for our product candidates;
- the clinical development plans we establish for these product candidates;
- the number and characteristics of product candidates that we develop or may in-license;
- the terms of any collaboration agreements we may choose to conclude;
- the outcome, timing and cost of meeting and maintaining compliance with regulatory requirements established by the FDA, the EMA and other comparable foreign regulatory authorities;
- the cost of filing, prosecuting, defending and enforcing our patent claims and other intellectual property rights;
- the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us;
- the effect of existing or new competing technological and market developments;
- the cost and timing of completion of commercial-scale outsourced manufacturing activities; and
- the cost of establishing sales, marketing and distribution capabilities for any product candidates for which we may receive regulatory approval in regions where we choose to commercialize our products on our own.

As of December 31, 2017, we had cash and cash equivalents of $51.4 million. We believe that the net proceeds from this offering, together with our existing cash and cash equivalents, will enable us to fund our operating expenses and capital expenditure requirements through . We have based these estimates on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical product candidates, we are unable to estimate the exact amount of our working capital requirements. Our future funding requirements will depend on and could increase significantly as a result of many factors, including those listed above.

Without giving effect to the anticipated net proceeds from this offering, we expect that our existing cash and cash equivalents will not be sufficient to fund our operating expenses and capital expenditure requirements through 12 months from the issuance date of our financial statements. We have concluded that this circumstance raises substantial doubt about our ability to continue as a going concern within one year after March 28, 2018, the issuance date of our financial statements for the year ended December 31, 2017. See Note 1 to our financial statements included elsewhere in this prospectus for additional information on our assessment.

Similarly, in its report on our financial statements for the year ended December 31, 2017, our independent registered public accounting firm included an explanatory paragraph stating that our recurring losses from operations since inception and required additional funding to finance our operations raise substantial doubt about our ability to continue as a going concern.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our operations through a combination of equity financings, debt financings, collaborations with other companies or other strategic transactions. We do not currently have any committed external source of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your

rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making acquisitions or capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings or other arrangements when needed, we may be required to delay, limit, reduce or terminate our research, product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of December 31, 2017 and the effects that such obligations are expected to have on our liquidity and cash flows in future periods:

	Payments Due By Period				
	Total	Less Than 1 Year	1 to 3 Years	4 to 5 Years	More Than 5 Years
			(in thousands)		
Operating lease commitments(1)	$612	$ 612	$ —	$ —	$ —
Total	$612	$ 612	$ —	$ —	$ —

(1) Reflects payments due for our sublease of office and laboratory space in Cambridge, Massachusetts under an operating lease agreement that expires in August 2018.

We enter into contracts in the normal course of business with CROs, CMOs and other third parties for clinical trials, preclinical research studies and testing and manufacturing services. These contracts are cancelable by us upon prior written notice. Payments due upon cancellation consist only of payments for services provided or expenses incurred, including noncancelable obligations of our service providers, up to the date of cancellation. These payments are not included in the preceding table as the amount and timing of such payments are not known.

We have also entered into license and collaboration agreements with third parties, which are in the normal course of business. We have not included future payments under these agreements in the table of contractual obligations above since obligations under these agreements are contingent upon future events such as our achievement of specified development, regulatory, and commercial milestones, or royalties on net product sales. As of December 31, 2017, we were unable to estimate the timing or likelihood of achieving these milestones or generating future product sales.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the Securities and Exchange Commission.

Recently Issued and Adopted Accounting Pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position and results of operations is disclosed in Note 2 to our financial statements appearing at the end of this prospectus.

Quantitative and Qualitative Disclosures about Market Risks

We are exposed to market risk related to changes in interest rates. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly

because our cash equivalents are in the form of a money market fund, which is primarily invested in short-term U.S. Treasury obligations. However, because of the short-term nature of the investments in our portfolio, an immediate 10% change in market interest rates would not have a material impact on the fair market value of our investment portfolio or on our financial position or results of operations.

We are not currently exposed to significant market risk related to changes in foreign currency exchange rates; however, we have contracted with and may continue to contract with foreign vendors that are located in Europe. Our operations may be subject to fluctuations in foreign currency exchange rates in the future.

Inflation generally affects us by increasing our cost of labor. We do not believe that inflation had a material effect on our business, financial condition or results of operations during the years ended December 31, 2016 and 2017.

Emerging Growth Company Status

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. We are considering whether to "opt out" of this provision and thereby comply with new or revised accounting standards as required when they are adopted. If we do decide to "opt out," this decision to "opt out" of the extended transition period under the JOBS Act is irrevocable.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an emerging growth company, we may rely on certain of these exemptions, including without limitation, providing an auditor's attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act. We would cease to be an emerging growth company upon the earliest of: (1) the last day of the fiscal year ending after the fifth anniversary of our initial public offering; (2) the last day of the fiscal year in which we have more than $1.07 billion in annual revenue; (3) the date we qualify as a "large accelerated filer," with at least $700.0 million of equity securities held by non-affiliates; or (4) the issuance, in any three-year period, by our company of more than $1.0 billion in non-convertible debt securities held by non-affiliates.

BUSINESS

Overview

For more than 50 years, doctors and patients have had difficult conversations about bone marrow transplant: the procedure can save patients' lives and cure them of disease, but the risk of toxicity and even mortality is often a significant deterrent. At Magenta, we believe we can refocus that conversation on the cure and enable many more patients with devastating diseases such as severe autoimmune diseases, including multiple sclerosis; blood cancers, including leukemia; and genetic diseases such as sickle cell disease to benefit from advances in transplant medicine.

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients.

Transplant is a well-established and often curative medical procedure, and emerging data on stem cell gene therapy, which is bone marrow transplant using gene-modified stem cells, suggest the potential for meaningful benefit with this newer form of transplant. Bone marrow transplant and stem cell gene therapies use the same widely- adopted decades-old transplant process. As it exists today, bone marrow transplant is a large market opportunity, and improvements to the current approaches could extend bone marrow transplant to more patients . The ability to treat patients with a bone marrow transplant is limited by the challenge of obtaining sufficient cells to perform the procedure, the inherent morbidity and mortality of current methods used to prepare patients for transplant, and complications following transplant.

At Magenta, we believe we are uniquely positioned to overcome these challenges and to lead a new era in transplant medicine. Our portfolio of product candidates includes biologics, small molecules and a cell therapy designed to address deficiencies in existing approaches and extend the curative power of bone marrow transplant to more patients across many diseases. Currently, only a fraction of eligible patients with these diseases receive a transplant because the risks and challenges outweigh the potential for a cure. These include diseases where bone marrow transplant is a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and autoimmune diseases. Emerging clinical data suggest that bone marrow transplant may represent a breakthrough approach with curative potential for patients with severe autoimmune diseases. For example, recent results from multiple clinical trials show that patients with autoimmune diseases, including multiple sclerosis and scleroderma, can be cured with a transplant. However, based on our epidemiology analyses, currently only approximately 1 to 2% of eligible patients with multiple sclerosis or scleroderma in the United States, or U.S., and Europe receive a bone marrow transplant.

To address the major unmet medical needs in the existing bone marrow transplant process, we are developing a stem cell biology discovery platform and comprehensive portfolio of first-in-class therapeutics. Our programs will improve stem cell dose (expansion), stem cell collection (mobilization), patient preparation for transplant (conditioning) and potential post-transplant complications, to address key limitations of the bone marrow transplant process to allow more patients to benefit. Within our expansion program, MGTA-456, our most advanced clinical product candidate, is a cell therapy that has achieved clinical proof of concept in 36 patients with blood cancers and is now being studied in patients with fatal inherited metabolic diseases. MGTA-456 is an expanded cord blood product, and has the potential to allow more patients to have a better chance for a successful stem cell transplant. Within our mobilization program, MGTA-145 is focused on enabling physicians to more easily harvest a greater number of blood stem cells, known as hematopoietic stem cells or HSCs, from patients and donors to improve patient outcomes. Our targeted transplant conditioning programs, which prepare the patient for transplant, are designed to selectively remove stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the decades-old radiation and chemotherapy-based approaches which are still the only available options. Our post-transplant complications program is designed to target the donor immune cells within the patient that cause Graft vs. Host Disease, or GvHD, which can be a fatal complication of transplant.

We intend to become a fully integrated discovery, development and commercial company in the field of transplant medicine. We believe that our product portfolio will offer significant commercial synergies. We are developing our products so that they can each be used individually or in combination with each other. As a result, our portfolio could be utilized in a manner tailored to the patient's disease, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.

Background on Bone Marrow Transplant

Bone marrow is the tissue inside the bones where HSCs are located. HSCs produce all of the cells in the blood and immune systems, including: T cells and B cells to fight infections; red blood cells to carry oxygen; and platelets to control bleeding. The bone marrow is highly active, and gives rise to billions of new cells every day. However, abnormal functioning of the system can lead to serious and sometimes fatal blood and immune diseases. The aim of bone marrow transplant, also called HSC transplant or stem cell transplant, is to replace the diseased blood and immune cells with new stem cells that will produce new blood and immune cells, thereby effectively resetting the blood and immune systems to a healthy state. Bone marrow transplant is a well-established procedure with curative intent, rooted in decades of clinical experience.

Starting from the first procedure in 1956, more than 1 million patients with blood cancers and genetic diseases worldwide have undergone a bone marrow transplant, and currently approximately 65,000 patients undergo the procedure annually. Bone marrow transplant serves as the standard of care in many blood cancers, such as leukemias, lymphomas and multiple myeloma; and for rare genetic diseases such as Hurler's syndrome and is the only curative option for sickle cell disease.

However, bone marrow transplant is a complex procedure that carries significant risks, including serious complications such as infection, secondary cancers and even patient death. A majority of patients who could significantly benefit from or be cured by a transplant do not receive one because of the toxicity and risks associated with the procedure. For example, primarily because of these risks, two out of three eligible patients suffering from acute myeloid leukemia do not receive a transplant despite it being the standard of care. For debilitating but non-life-threatening diseases, such as sickle cell disease and multiple sclerosis, even fewer patients are offered and receive a transplant because the risks of the current transplant procedure often outweigh the potential benefits. There is a clear need to improve the safety and efficacy of transplant so that we can refocus the patient and physician conversation and bring the curative power of transplant to more patients.

Bone Marrow Transplant: The Process and Challenges

A bone marrow transplant procedure utilizes a number of integrated steps, which we highlight below: stem cell sourcing and collection, patient conditioning and stem cell infusion and engraftment. All transplants are categorized as either autologous or allogeneic, depending on the source of cells for the transplant. In an autologous transplant, used for conditions such as multiple myeloma, non-Hodgkin's lymphoma and autoimmune diseases, the patient's own stem cells are used. This is also the case for stem cell gene therapy. In an allogeneic transplant, used for conditions such as acute leukemia and genetic diseases, patients receive cells from a stem cell donor or umbilical cord blood.

Step 1: Stem Cell Sourcing and Collection

Once the patient and physician agree that bone marrow transplant is the best treatment option, first the source of stem cells must be identified and then the cells are collected. There are three sources of stem cells for transplant:

- extraction from the bone marrow, which requires a procedure performed under general anesthesia where cells are withdrawn directly from the bone marrow with needle aspirates;

- mobilization into the peripheral blood, which requires several days of injections of a drug or combination of drugs to mobilize the cells, or move them from the bone marrow into the bloodstream, where they are then collected through a process called apheresis; and
- harvesting from umbilical cord blood units, which are stored in cord blood banks.

In the case of stem cell gene therapy, once the cells are collected from the patient, they are then modified to either insert a functioning gene or correct a defective gene.

Challenges

Finding a matched donor: For patients requiring an allogeneic transplant, the preferred source of stem cells is a donor from their family who has a well-matched immune system. For patients without a matched, related donor, the second option is a matched, unrelated donor identified through the bone marrow donor registry. Although there are more than 25 million registered bone marrow donors worldwide, nearly half of all patients are unable to find a matched donor. For patients without a matched donor, other options include mismatched donors, who can either be unrelated or related; however, transplant outcomes are not optimal with these donor types. For patients without a matched, related donor, umbilical cord blood also provides a potential source of stem cells. However, despite the utility of this approach, there are significant challenges with umbilical cord blood transplant. Even when patients find matched cord blood units, transplants are severely limited because there are often too few stem cells in the cord blood unit. Although more than 712,000 units are available in the worldwide cord blood inventory, current cell dose requirements mean that fewer than approximately 4% of these units contain enough stem cells for use in adult patients. Because so few units are suitable for use in patients, the patient is less likely to find a closely matched cord blood unit, leading to less than optimal transplant outcomes.

Stem cell collection: It is critical that physicians obtain enough stem cells for the transplant, whether from a patient or a donor, as higher cell doses are closely correlated to better patient outcomes. In some cases, multiple invasive bone marrow harvests are needed to obtain an adequate number of stem cells. The autologous transplant field has moved away from bone marrow harvest to stem cell mobilization in recent years due to the difficulty of the procedure for both patients and physicians. In the case of stem cell mobilization, current treatments involve repeated injections and are often associated with bone pain, nausea, headache, and fatigue. Another challenge associated with current mobilization approaches is the difficulty of predicting whether mobilization will be successful, especially in heavily treated blood cancer patients. In fact, most patients require multiple days of apheresis and some patients require more than one mobilization procedure to obtain a sufficient number of cells for transplant. Additionally, mobilization failure rates for autologous transplants are as high as 40%. Given that mobilized peripheral blood is the predominant source of stem cells for transplant, there is a need for better HSC mobilization agents.

Step 2: Conditioning

Once sufficient cells have been obtained, the patient is then conditioned for transplant using systemic, toxic chemotherapy and/or radiation. Depending on the disease and type of transplant, the conditioning treatment is intended to remove or deplete:

- existing stem cells in the bone marrow to provide space for the incoming stem cells;
- immune cells (T cells and B cells) to prevent rejection of the incoming cells or remove disease-causing autoimmune cells; and/or
- cancer cells to prevent disease relapse in patients with blood cancers.

Challenges

Conditioning toxicity: Bone marrow transplant conditioning is very burdensome and risky for both pediatric and adult patients. Conditioning treatments today are typically non-targeted and involve systemic, toxic

chemotherapy and/or radiation. Most of these genotoxic chemotherapy agents, including derivatives of mustard gas, were discovered more than 50 years ago, and were never intended for bone marrow transplant conditioning. The current treatments eradicate the stem and immune cells and diseased cells but also indiscriminately damage DNA and kill normal, healthy cells in the body, which can lead to severe infections, organ failure, infertility, secondary cancers and even death. Nearly all transplant patients experience complications as a result of current conditioning treatments, and conditioning toxicity is responsible for up to 35% of mortality following allogeneic transplants. The side effects and mortality risk of conditioning are among the major barriers preventing bone marrow transplants from being performed more widely in other diseases where they may be curative. Efforts to reduce chemotherapy doses have met with some success, but the most commonly used conditioning regimens all involve the use of genotoxic agents.

Step 3: Stem Cell Infusion and Engraftment

Once conditioning is complete, the stem cells are infused into the patient via the bloodstream. The cells travel to the bone marrow and engraft there, meaning they lodge in the bone marrow and begin to make new blood and immune cells. Once the bone marrow has made enough blood cells – particularly white blood cells to fight infection – which typically takes several weeks, the patient can be discharged from the hospital. There are instances where the stem cells do not engraft or are rejected by the patient's body, leading to prolonged hospitalization and the need for an additional transplant. Outcomes of additional transplants are typically very poor.

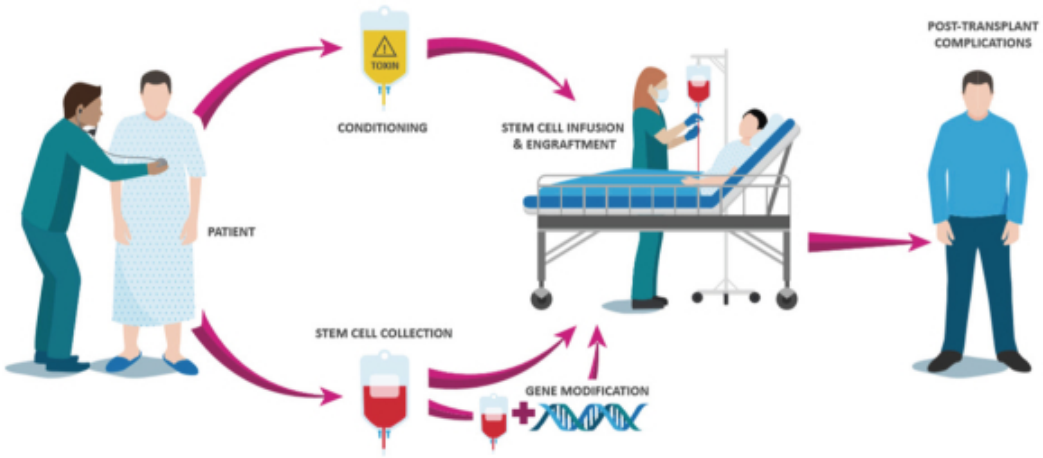
Challenges

Transplant rejection: A major complication of stem cell transplant is when the infused stem cells are rejected by the patient's body. Rejection is a particular problem where stem cell doses are low, for example with cord blood transplants.

Delayed engraftment: Depending on the dose of stem cells infused, engraftment can take between two to six weeks. During this period, patients are required to be in specialized isolation rooms at the hospital and are susceptible to infections.

Graft vs. Host Disease: GvHD is a reaction that commonly develops after an allogeneic bone marrow transplant and is a result of the donor immune cells recognizing the patient's cells as foreign and attacking them. Acute GvHD typically occurs within weeks of a patient receiving a bone marrow transplant and can severely damage the skin, liver, and gastrointestinal system. GvHD accounts for approximately 10% of deaths following allogeneic transplant.

Transplant Patient Journey



Our Solutions

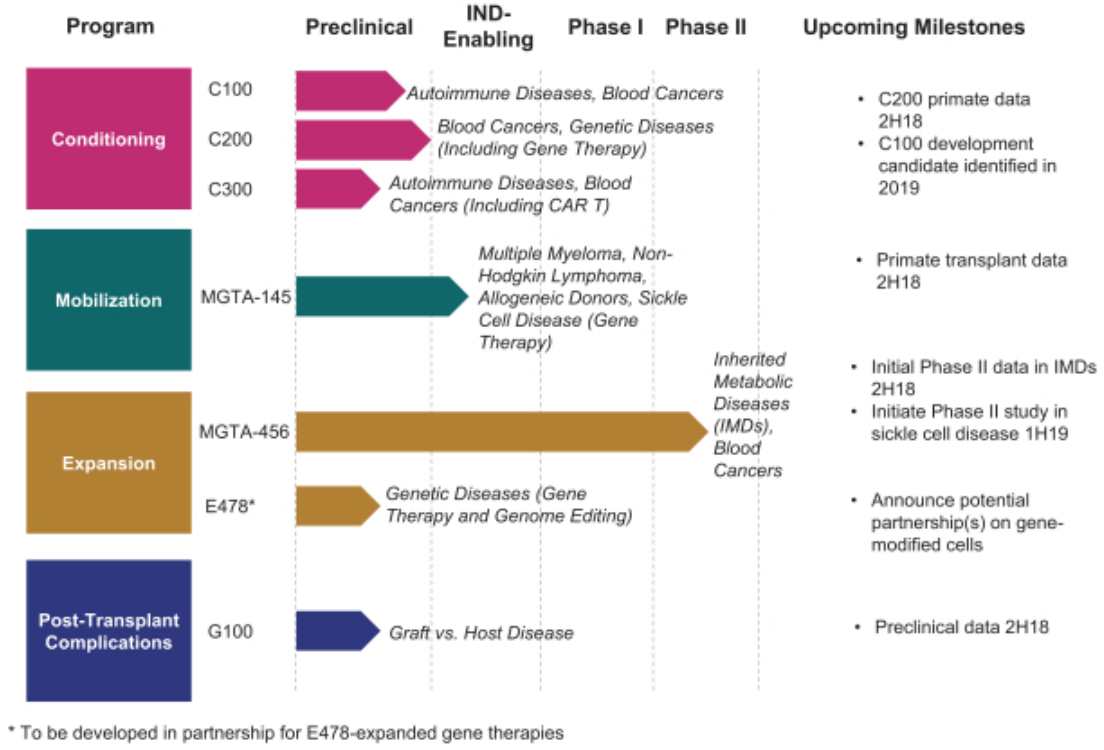
We are applying our expertise in stem cell biology and biotherapeutics discovery to bring innovative, modern medicines to the transplant field through our programs, specifically designed to address each of the key challenges of the bone marrow transplant journey for patients:

- ***Stem cell source and engraftment challenges (expansion programs)***: Our stem cell expansion programs are focused on generating higher cell doses, which have been shown to improve the speed and success of engraftment in bone marrow transplant. Through the cord blood expansion process, our MGTA-456 product candidate also has the potential to allow more patients to access better matched cord blood units that were previously not available due to low cell dose. Our AHR antagonist, E478, uses the same mechanism applied to make MGTA-456 to expand gene-modified HSCs for gene therapy and genome editing.
- ***Stem cell mobilization (mobilization program)***: Our stem cell mobilization program is focused on enabling physicians to more easily collect larger numbers of high-quality HSCs from patients and donors to yield higher cell doses for transplant.
- ***Conditioning toxicity (targeted conditioning programs)***: Our targeted transplant conditioning programs are designed to selectively eliminate stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the current radiation and chemotherapy-based treatments. These programs focus on developing targeted products that deplete specific cell types, with an approach that is tailored to the patient's disease and designed to be less toxic than the current chemotherapy-based treatments.
- ***GvHD (post-transplant complications program):*** Our post-transplant program is designed to target the donor immune cells within the patient that cause GvHD, potentially reducing the occurrence of GvHD without sacrificing the benefits of an allogeneic transplant, broadening access to the curative potential of transplant.

Our Current Product Pipeline

We are developing a pipeline of small molecules; biologics, including antibody drug conjugates; and a cell therapy, which we believe can meaningfully improve and expand curative bone marrow transplant options for many more patients with autoimmune diseases, blood cancers and genetic diseases. Our portfolio of novel

medicines for transplant has the potential to allow more patients with debilitating or life-threatening diseases to access a one-time, transformative bone marrow transplant with better outcomes, less toxicity risk and less mortality risk. We are developing our product candidates so that they can each be used individually or in combination with each other, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.



C100, C200, C300: targeted antibody-drug conjugates for conditioning

We are developing a suite of first-in-class antibody-drug conjugates, or ADCs, for transplant conditioning, a step in the transplant process that is still dominated by the use of systemic chemotherapy agents and radiation. We are seeking to replace these non-targeted toxic conditioning agents with targeted ADCs. These drugs are designed for transplant and specifically deplete only the cell types required to be eliminated in order to perform a successful transplant. Certain ADCs are currently used to treat cancer by directing a toxin to specific cells using antibodies. Our programs are adapting this clinically validated modality for conditioning patients for bone marrow transplant.

All of our conditioning programs share an ADC platform but differ in the targeted cell types. The C100 program targets both HSCs and immune cells, the C200 program targets only HSCs and the C300 program targets only

immune cells. This is achieved by tuning the antibodies to specific cellular markers or receptors that are expressed on the particular cell types.

	C100	C200	C300
Lead target	CD45	CD117	Undisclosed
Cells removed	Stem and Immune Cells	Stem Cells	Immune Cells
Diseases	Autoimmune diseases Blood cancers	Genetic Diseases Genetic Diseases (Gene Therapy) Blood cancers	Autoimmune diseases Blood cancers Blood Cancers (CAR T)

Our most advanced conditioning program, C200, is designed to specifically deplete HSCs. Our lead ADC product candidate targets CD117, also known as c-Kit, which is highly expressed on HSCs and leukemia cells, making it an ideal target for conditioning across broad sets of diseases. This includes blood cancers as well as hemoglobinopathies like sickle cell disease and beta-thalassemia, with potential applicability in both bone marrow transplant and stem cell gene therapy. At the American Society of Hematology, or ASH, annual meeting in December 2017, we presented data showing that a single dose of CD117-ADC depleted more than 90% of human HSCs in the bone marrow of humanized NSG (immunodeficient) mice and was well tolerated over the entire 21-day study. Preliminary data suggest that a single dose of CD117-ADC is also effective at significantly reducing tumor burden and conferring survival benefits in mice challenged with CD117-expressing acute myelogenous leukemia cells. Our antibodies are designed to also recognize the target antigen in non-human primates, which gives us the opportunity to evaluate efficacy and safety in non-human primates prior to conducting human clinical trials. We are currently studying CD117-ADC in non-human primates and expect to submit primate proof of concept data for presentation at a medical meeting in late 2018.

The second conditioning program in our portfolio is C100, under which we are developing ADCs that specifically deplete host HSCs and immune cells. Within our C100 program, our lead target is CD45, an important cell surface molecule broadly expressed throughout the hematopoietic and immune systems. We are currently in the lead identification stage for this program and intend to declare a development candidate in 2019. We plan to develop C100 for use in patients with CD45-expressing leukemias and lymphomas, followed by patients with autoimmune diseases such as multiple sclerosis and scleroderma.

Our third ADC-based conditioning program, C300, targets T cells, a type of immune cell. T cell depletion is currently performed with highly toxic, non-specific drugs which can lead to immune deficiency, infections and other complications including secondary autoimmune reactions. We are pursuing targets expressed on the surfaces of T cells with the goal of offering a safer and more optimized targeted conditioning approach through T cell depletion before CAR T therapy for blood cancers, prevention of stem cell rejection prior to allogeneic bone marrow transplant or achievement of immune system reset before autologous bone marrow transplant in autoimmune disease patients.

MGTA-145: CXCR2 agonist combined with plerixafor for HSC mobilization

MGTA-145 is a first-in-class stem cell mobilization product candidate that was developed based on our understanding of the physiological mechanisms that control stem cell mobilization. The goal of MGTA-145 is to achieve high levels of stem cell mobilization in patients and donors in order to replace the current standard of care, a drug known as granulocyte colony-stimulating factor, or G-CSF. G-CSF is a glycoprotein that mobilizes stem cells indirectly and comes with limitations that include a prolonged treatment period of up to one week of injections, lack of efficacy in some patients, and significant bone pain. MGTA-145 is a CXCR2 agonist protein that activates neutrophils to release proteases that cause the release of HSCs into the blood. This novel mechanism of action is complementary to that of plerixafor, another commonly used mobilization agent marketed by Sanofi. Plerixafor acts as a small molecule CXCR4 antagonist, blocking a pathway that otherwise

plays an essential role in attracting and retaining HSCs in the bone marrow. The combination of MGTA-145 and plerixafor leads to a synergistic, robust and rapid stem cell mobilization, which was highlighted in recent data we presented at the ASH annual meeting in December 2017. Based on these results, we have initiated IND-enabling studies of MGTA-145 in combination with plerixafor and expect to file an Investigational New Drug Application, or IND, with the U.S. Food and Drug Administration, or FDA, for this product candidate in 2019. We plan to develop MGTA-145 for mobilization first in patients with multiple myeloma and non-Hodgkin lymphoma, followed by healthy donors for allogeneic transplant. We plan to further investigate MGTA-145 in patient populations where G-CSF can exacerbate the disease such as autoimmune diseases, and patient populations where G-CSF is contra-indicated, such as sickle cell disease.

MGTA-456: aryl hydrocarbon receptor (AHR) antagonist expanded stem cells

Our most advanced product candidate, MGTA-456, is a first-in-class proprietary allogeneic stem cell therapy that was developed based on our understanding of the mechanisms that control stem cell growth. The goal of MGTA-456 is to extend the use of cord blood transplant to more patients by generating a higher stem cell dose. This is done by expanding a single umbilical cord blood unit *ex vivo* with a small molecule AHR antagonist. AHR antagonism is a novel, well-studied and clinically validated pathway that controls the self-renewal and differentiation of human HSCs. We have applied this technology to increase the number of HSCs present in an umbilical cord blood unit to extend the use of umbilical cord blood as a stem cell source for transplant. In addition, MGTA-456 also has the potential to improve overall survival by allowing more patients to have access to better matched cord blood units, which is associated with better outcomes and lower rates of post-transplant complications.

MGTA-456 has achieved human proof-of-concept in a Phase I/II study in patients with blood cancers. Data from the study showed that the median expansion of stem cells from the original cord blood unit was 330-fold, and all 36 patients treated with MGTA-456 in the study successfully achieved engraftment of these expanded stem cells. The rapid and robust engraftment of MGTA-456 in patients with blood cancers suggests that MGTA-456 may also improve engraftment in other patients in whom engraftment failure is a potential problem. For example, a group of diseases where cord blood transplant is routinely used is inherited metabolic diseases, which typically affect infants and young children. Although transplant can be curative in these diseases, up to 20% of patients with inherited metabolic diseases treated with transplant experience engraftment failure, resulting in severe complications, including death. We believe the high number of HSCs present in MGTA-456 should speed engraftment, reduce or eliminate engraftment failure and improve patient outcomes.

We have initiated a Phase II study of MGTA-456 in patients with inherited metabolic diseases and intend to explore other debilitating diseases where we believe MGTA-456 could bring transformative benefit to patients. We expect to report initial data from our Phase II study in late 2018. If the results from this trial are favorable, we plan to initiate a Phase III trial in 2019. We also intend to initiate a Phase II study of MGTA-456 in patients with sickle cell disease in early 2019.

We obtained the rights to MGTA-456 through an April 2017 license agreement with Novartis International Pharmaceutical Ltd., or Novartis, granting us the sole worldwide rights to research, develop and commercialize certain AHR antagonist compounds specifically for the expansion of cord blood-derived non-gene-edited/-modified HSCs. See “Licenses and Collaborations” section.

E478: AHR antagonist for expansion of gene-modified stem cells

E478 is a novel and proprietary small molecule AHR antagonist that was developed to increase the number of gene-modified HSCs *ex vivo* for stem cell based-gene therapy. Gene therapy, or bone marrow transplant with gene-modified or genome-edited cells, is a promising treatment approach for several diseases. However, this approach is significantly limited by the inability to generate a sufficient dose of gene-modified HSCs that retain the ability to engraft in patients as well as the cost and complexity of manufacturing viral vectors for gene

modification of cells. These constraints could limit the commercial viability of this approach. E478 uses the same clinically validated mechanism as MGTA-456 to expand gene-modified HSCs. In addition to addressing cell dose limitations, the ability to expand long-term repopulating HSCs *ex vivo* has the potential to reduce manufacturing costs for these therapies by requiring less viral vector for gene modification of the stem cells. At the ASH annual meeting in December 2017, we presented data showing that culturing gene-modified human HSCs with E478 increased the number of gene-modified stem cells that retained engraftment ability in preclinical models. We are developing E478 specifically to partner with gene therapy companies. E478 would be integrated into our potential partners' cell-based products leading to a newly defined cell therapy.

G100: ADC program for prevention of acute GvHD

We are developing a unique approach to preventing acute GvHD, a major complication and a leading cause of death in allogeneic transplantation. GvHD occurs when alloreactive T cells in the donor stem cell graft recognize the patient as foreign and attack their tissues. Current treatments for acute GvHD prevention include the prophylactic use of non-specific immune suppressive agents. The use of high doses of non-specific immune suppressive agents for GvHD treatment is correlated with an increased risk of infection and poor immune function, and despite the use of these powerful immune suppressive agents, approximately 50 to 80% of allogeneic transplant patients will experience acute GvHD. Our G100 program is designed to selectively eliminate only the components of the graft that cause acute GvHD, specifically the alloreactive T cells. This ADC therapy is intended to be dosed *in vivo* at the time of transplant. By specifically targeting the alloreactive T cells that arise shortly after transplant, this therapy should spare the remainder of the patient's immune system to allow immune recovery and protection from infections.

Our Strategy

Our mission and our culture are centered around the goal of enabling more patients with severe or life-threatening diseases to have access to the transformative benefit of a bone marrow transplant. We intend to provide physicians with a tailored, multi-product treatment regimen based on the disease setting and the individual needs of each patient. Our strategic priorities are as follows:

***Bring the curative power of bone marrow transplant to all patients who can benefit by advancing an integrated product portfolio*:** We believe we are the only company that is committed to addressing the major limitations and challenges of bone marrow transplant to revolutionize this entire field of medicine. Our product engine is generating a comprehensive portfolio of therapies to optimize the bone marrow transplant process. Our initial focus is on inherited genetic diseases, blood cancers and autoimmune diseases, and we also plan to address other diseases for which transplant could represent a one-time, curative treatment.

***Build on our deep expertise in stem cell biology to lead a new era in transplant medicine*:** We have assembled a group of world leaders and pioneers in the fields of stem cell biology, biotherapeutics and transplant medicine. With this team, we are converting recent scientific breakthroughs into a product engine for bone marrow transplant therapies.

***Create a fully integrated patient-focused biotechnology company*:** We are building a fully integrated biotechnology company with end-to-end capabilities in research, development and commercialization, and we believe the broad and synergistic nature of our portfolio will allow us to address many of the significant limitations of bone marrow transplant.

***Commercialize our therapeutics to bring tailored transplant solutions to physicians and patients*:** We are developing our portfolio of products so that they can be used individually or in combination with each other, such that a patient may receive more than one Magenta therapy as part of their individual patient journey. Our commercial model centers around hospital-based prescribers, and this is consistent across all of the products in our portfolio. Bone marrow transplants are performed in a few hundred medical centers in the U.S. and Europe,

with more than half of these procedures performed at the top 20% of transplant centers. We believe the synergies among our programs and the well-defined structure of the current bone marrow transplant provider network will allow us to commercialize all of our own therapeutics in the U.S. and Europe through a focused, targeted commercial organization.

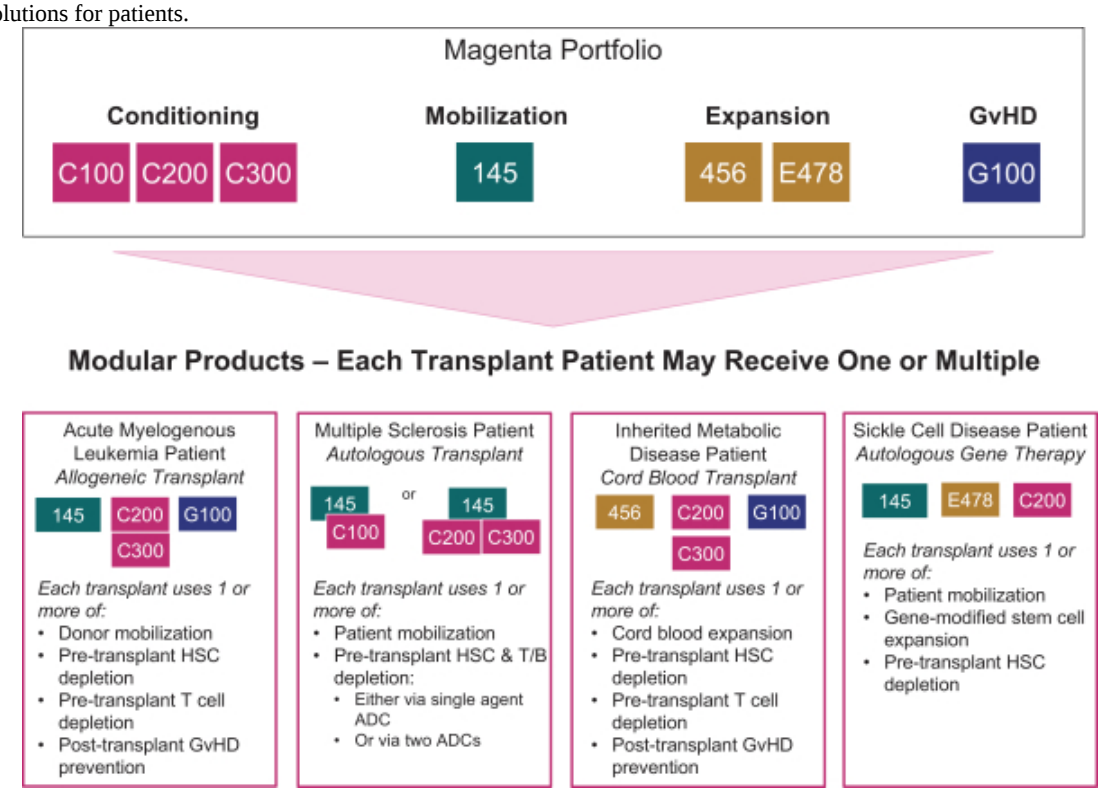
***Leverage our most advanced product candidate, MGTA-456, as a clinical catalyst and commercial beachhead for our portfolio*:** We obtained the rights to MGTA-456, a clinical program currently in Phase II studies, through an April 2017 license agreement with Novartis. In addition to its potential to bring meaningful clinical benefit to patients, MGTA-456 provides strategic value to Magenta by allowing us to accelerate the build-out of our clinical development infrastructure and footprint and to establish key customer relationships that will be important for future commercialization of our products.

***Continue to integrate our innovative collaboration with Be The Match with our science, medicine and business approaches*:** Be The Match is the leading patient-focused bone marrow transplant organization in the U.S. Because of our shared patient focus, we and Be The Match have established a broad, first-of-its-kind collaboration. This collaboration positions us as a partner with high-priority access to many services that will continue to enable us to establish relationships across transplant centers and with key transplant physicians. Through our partnership, we access clinical strategy support; clinical development operational support, including a unique cell supply platform that is very well established at Be The Match and which will also enable our commercialization efforts across several programs. We also have access to the Be The Match payer and policy group to support our pricing and reimbursement plans across the portfolio.

***Strategically collaborate to realize the full potential of our portfolio*:** We currently retain 100% of the commercial rights for our products. We will evaluate additional collaborations to:

- maximize the patient impact of our portfolio by partnering to enable cell therapies, including stem cell-based gene therapies, genome editing and CAR T therapy;
- build relationships with partners to access complementary expertise and capabilities to bring our therapies as quickly as possible to all patients who can benefit; and
- opportunistically bring in preclinical or clinical assets that fit with our integrated portfolio.

The chart below illustrates the synergistic nature of our portfolio of products, with examples of how our products could be used in combination to create disease-tailored solutions for patients.



Our Current Programs

		Unmet Needs	Our Value Proposition	Our Programs/Product Candidates	Development Stage
Patient Conditioning		Toxic patient conditioning with significant side effects, including morbidity and mortality	Minimize transplant-related mortality and morbidities Reduce toxicity Reduce relapse rates	C100 C200 C300	Preclinical Preclinical Preclinical
Stem Cell Collection		Non-robust stem cell mobilization with side-effects	Safely mobilize without severe side effects Same day dosing and apheresis to maximize operations efficiency	MGTA-145	IND-enabling studies
Stem Cell Source		Limited sources of stem cells and poor engraftment outcomes	Minimal graft rejection Faster time to engraftment and immune reconstitution Broadens access to transplant with well-matched cord blood cells	MGTA-456 E478	Phase II (IMDs, blood cancers) Preclinical
Post-Transplant Complications		High risk of Graft vs. Host disease, mortality	Prevent acute GvHD	G100	Preclinical

Conditioning Programs

Unmet need

For patients undergoing bone marrow transplant, the toxicity and mortality associated with current conditioning protocols are significant challenges and prevent more patients from benefitting from a life-saving and potentially curative transplant procedure. In many diseases, physicians have needed to use the most aggressive conditioning regimens to generate the best efficacy outcomes for transplant.

Conditioning treatments today are typically non-targeted and involve high doses of radiation and/or toxic chemotherapy. These chemotherapy agents, including derivatives of mustard gas, were discovered more than 50 years ago and were never intended for bone marrow transplant conditioning. The current treatments eradicate the stem and immune cells and diseased cells but also indiscriminately damage the DNA and kill normal, healthy cells in the body, which can lead to serious infections, organ failure, infertility, secondary cancers and even death. Nearly all transplant patients experience complications as a result of current conditioning treatments, and conditioning toxicity is responsible for up to 35% of mortality following allogeneic transplants.

Emerging clinical data have shown that we are now at a stage where autoimmune disease can be cured with a transplant, with recent data in multiple sclerosis and scleroderma. However, the toxicity of the required conditioning regimens leads many physicians to conclude that the risks of transplant in these patient populations far outweigh the benefits. A pair of comprehensive reviews published in 2017 in *Nature* journals summarized the clinical transplant results in multiple sclerosis and broader rheumatic autoimmune diseases. The main conclusions from this combined experience in over 3000 patients during the past 20 years were that the therapeutic benefit of stem cell transplant is significant across multiple studies in severe autoimmune diseases: Relapsing remitting multiple sclerosis, or RRMS, (five Phase II trials) and systemic sclerosis (two Phase II trials and two randomized trials) have the most clinical evidence using stringent disease endpoints. When compared to the standard of care in RRMS, the proportion of patients with clinical benefit at two years appears to be double

that of the next best treatment (Figure 1). Given bone marrow transplant's ability to durably eliminate relapses and disease activity in multiple sclerosis patients, we believe a safer transplant procedure would be a viable option for those patients with highly active disease beyond what therapeutics can manage. However, currently only approximately 1 to 2% of eligible patients with multiple sclerosis and scleroderma in the U.S. and Europe receive a bone marrow transplant primarily because the risk of the procedure outweighs the benefits of a potential cure. We believe we can significantly expand the number of autoimmune patients who can benefit from transplant.

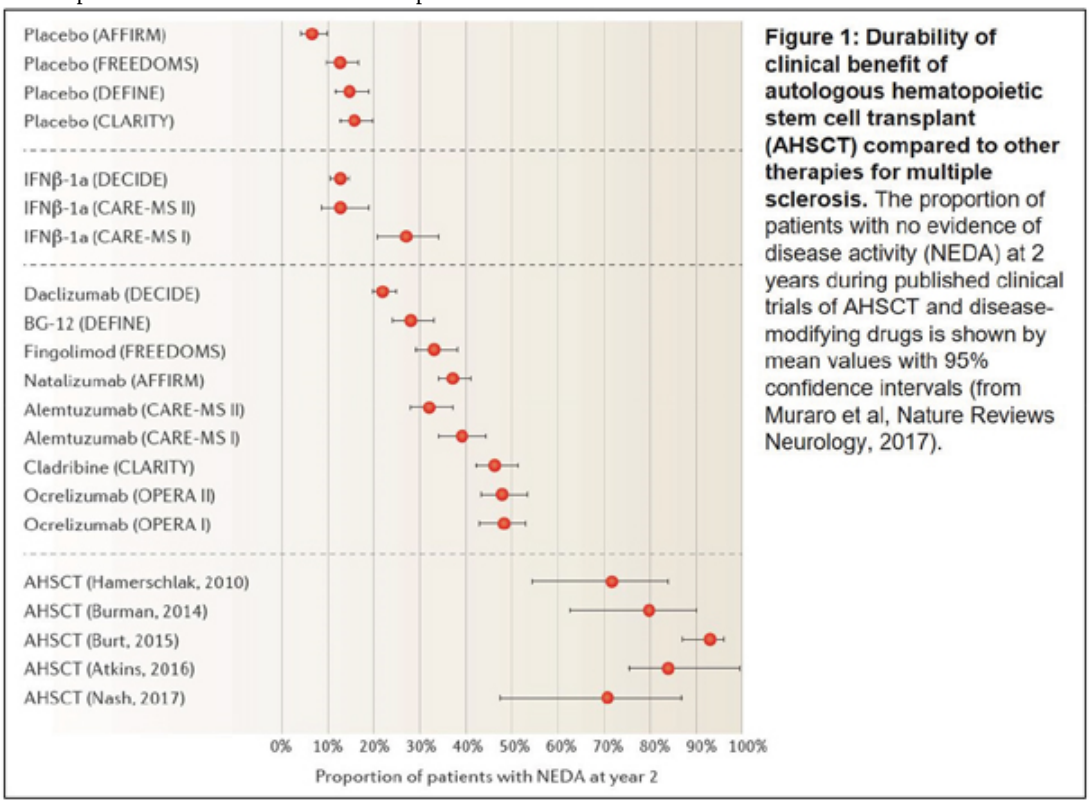


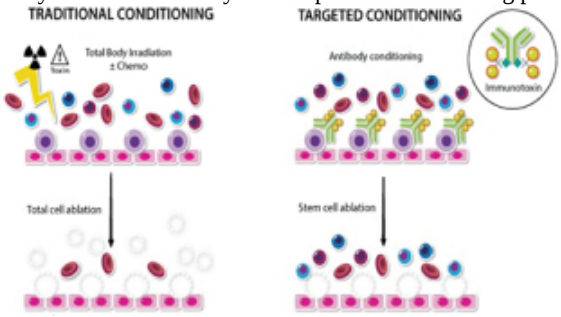
Figure 1: Durability of clinical benefit of autologous hematopoietic stem cell transplant (AHSCT) compared to other therapies for multiple sclerosis. The proportion of patients with no evidence of disease activity (NEDA) at 2 years during published clinical trials of AHSCT and disease-modifying drugs is shown by mean values with 95% confidence intervals (from Muraro et al, Nature Reviews Neurology, 2017).

Our solution

We are developing a suite of first-in-class ADCs for transplant conditioning. We are seeking to replace the current non-targeted toxic conditioning agents with targeted ADCs designed for transplant that specifically deplete only the cell types required to be eliminated in order to perform a successful transplant. While ADCs are an established treatment for certain cancers, we believe this is the first time that ADC technology has been harnessed for transplant medicine. These programs have the potential to expand the curative power of transplant beyond the eligible patient populations to patients who cannot tolerate current conditioning regimens, and to patients with autoimmune diseases, such as multiple sclerosis, where the current risk-benefit of transplant is not considered favorable due to the toxicity of the existing conditioning regimens.

ADCs are a technology developed over the past 20 years where a monoclonal antibody specific for a cell surface protein is coupled to a drug. The ADC binds the receptor on the target cell, is internalized and degraded to release the drug into the target cell. Coupling the drug to the antibody increases the specificity of drug delivery to the target cell, reducing systemic exposure and increasing the safety and efficacy compared to delivering the drug

alone or the antibody without the drug attached. Today most ADCs are directed toward treating cancer cells expressing specific target receptors enriched on tumor cells. Our programs build on this clinically validated modality and adapt it for conditioning patients for bone marrow transplant.



Targeted conditioning is more specific compared to traditional conditioning. Traditional conditioning is performed with total body irradiation and chemotherapy which eliminates all hematopoietic cells and nonspecifically damages other organs. Targeted conditioning with an antibody drug conjugate specifically eliminates the hematopoietic stem cells while sparing the immune system and avoiding systemic side effects.

In our development of ADCs for use in conditioning, we are optimizing for several key parameters:

- First, the antibody must specifically target a receptor that is expressed on the cells of interest, but not on other cell types.
- Second, to comply with typical bone marrow transplant conditioning timelines, the antibody must have suitable efficacy to ensure that the ADC is able to kill the target cells rapidly — days rather than weeks or months.
- Third, the antibody clearance needs to be accelerated so that it is eliminated by the time the transplanted cells are infused into the patient, typically within a week of starting conditioning. This requirement stems from the fact that the target receptor is expressed on cells present in the patient but also on the similar cell types in the transplanted cells.
- Finally, the linker-drug must be able to kill non-dividing cells as most HSC and immune cells are not actively dividing. The ADC linker must be chosen to minimize damage to non-target cells.

We are addressing each of these requirements through careful selection of the appropriate target receptor as well as antibody properties, including binding site, affinity, half-life and linker toxin.

We are developing three distinct programs for bone marrow conditioning that specifically deplete the particular cells that need to be removed to make room for the incoming cells. These programs share a common platform but differ in the cell types targeted: The C100 program targets both HSC and immune cells, the C200 program targets only HSCs and the C300 program targets only immune cells. The lead antigen targets for C100 and C200 and potential applications for each program are listed in the table below.

	C100	C200	C300
Lead target	CD45	CD117	Undisclosed
Cells removed	Stem and Immune Cells	Stem Cells	Immune Cells
Diseases	Autoimmune diseases Blood cancers	Genetic Diseases Genetic Diseases (Gene Therapy) Blood cancers	Autoimmune diseases Blood cancers Blood Cancers (CAR T)

C200 program

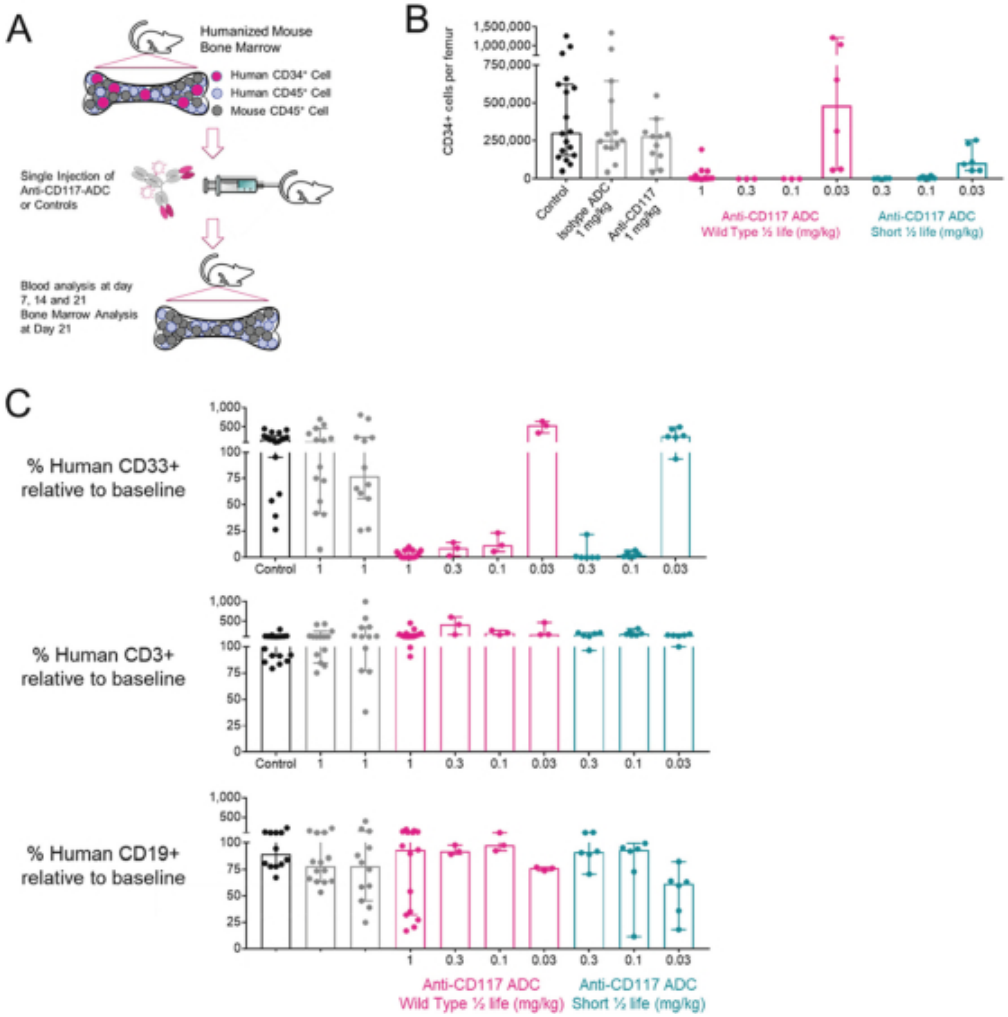
Our most advanced conditioning program, C200, is designed to specifically deplete HSCs. Our lead ADC product candidate targets CD117, also known as c-Kit, which is expressed on HSCs, making it an ideal target for conditioning across broad sets of diseases. This includes blood cancers, hemoglobinopathies (sickle cell and beta-thalassemia), and inherited metabolic diseases, with potential applicability in both bone marrow transplant and HSC based gene therapy.

We are currently evaluating several key parameters to develop and optimize our CD117-ADCs for the C200 program. This includes investigating different toxins, methods of attaching the toxin to the antibody, the number of toxin molecules per antibody and modifications to the antibody that impact binding site and target affinity, half-life and interactions with other antibody binding proteins. The antibody components of our ADCs are designed to also recognize the target antigen in humans and non-human primates and deliver the toxin to target cells. This selectivity provides the opportunity to evaluate and optimize the efficacy and safety during preclinical studies in both mice bearing a human immune system and non-human primates prior to conducting human clinical trials. We are currently studying probe CD117-ADC molecules in mice and non-human primates and have seen encouraging preliminary data. The results using these probe CD117-ADCs are establishing proof of mechanism for the ability of CD117-ADC to selectively deplete HSCs, provide an early look at safety and tolerability and establish these critical preclinical mouse and non-human primate models to guide the further development of our C200 program.

Preclinical pharmacology studies

To investigate the potential of CD117-ADC to kill human HSCs *in vivo*, we performed studies using immunodeficient NSG mice that have been engrafted with human HSCs, a commonly used preclinical model to study human HSC biology. At the joint annual meetings of the American Society of Bone Marrow Transplant and the Center for International Bone Marrow Transplant Research, or CIBMTR, and collectively, Tandem, in February 2018, we presented data showing that a single dose of CD117-ADC can deplete human HSCs *in vivo*. For this experiment, human engrafted mice were treated with a single dose ranging from 0.03 to 1 mg/kg of body weight of CD117-ADC or a variant of CD117-ADC modified to have a reduced half-life. Controls included mice that were untreated or treated with 1 mg/kg of an Isotype-ADC or unconjugated CD117 antibody. Analysis of human cell numbers in the blood of these mice showed a marked and stable reduction of HSC-derived CD33+ myeloid cells in mice treated with either variant of the CD117-ADC at doses of 0.1 mg/kg or higher, while lymphoid cells, including T cells, were unaffected. We believe this reflects the specificity of the CD117 antibody for HSCs and the rapid turnover of human CD33+ cells in this system due to engulfment by mouse-derived phagocytes and the lack of CD117 expression on lymphoid cells. The depletion of CD33+ myeloid cells was an on-target, toxin-dependent effect because the effect was not observed with the Isotype-ADC or unconjugated CD117 antibody. To confirm that the CD117-ADC can deplete human HSC, the mice were euthanized three weeks after treatment and HSCs were enumerated in the bone marrow by flow cytometry.

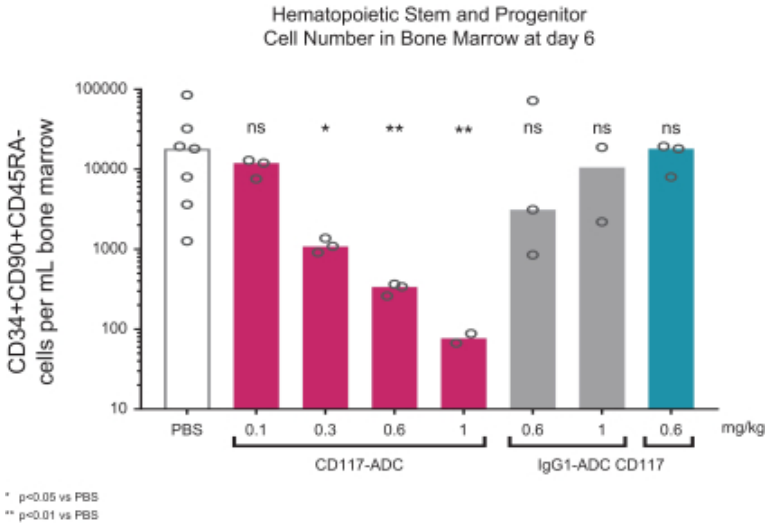
This analysis showed that both variants of CD117-ADC eliminated >95% of human CD34+ cells, at doses of 0.1 mg/kg or higher, while unconjugated CD117 antibody or Isotype-ADC had no impact on CD34+ numbers.



CD117-ADC selectively depletes human HSCs in humanized NSG mice. (A) Schematic of the *in vivo* model. CD117-ADC or controls were dosed on day 0. PBMCs and bone marrow were collected on day 21 and examined by flow cytometry. **(B)** The absolute number of CD34+ cells in the bone marrow of CD117-ADC or control treated mice. **(C)** Percent of human myeloid, T cells, and B cells present in the peripheral blood of CD117-ADC or control treated mice, expressed as a percent of that cell population prior to treatment (normalized to baseline).

Based on these positive findings in humanized mice, we next tested the ability of a probe CD117-ADC to deplete HSCs in non-human primates. This proof-of-mechanism study was designed as a dose escalation study to determine at what level, if any, CD117-ADC administration would result in HSC depletion and sustained hematopoietic failure. In addition, the study was designed to provide preliminary safety data to guide further development. Successful HSC depletion with the ADC was expected to cause hematopoietic failure as these animals will not undergo a subsequent bone marrow transplant to replenish the depleted HSCs.

The ongoing study shows significant dose-dependent HSC depletion in the bone marrow six days after treatment with the probe CD117-ADC. In contrast, treatment with an unconjugated CD117 antibody or a control ADC not targeted to CD117 did not significantly impact HSC numbers in the bone marrow.



HSC numbers following a single dose of CD117-ADC or unconjugated CD117 antibody (CD117) or non-targeted ADC (IgG1-AM).

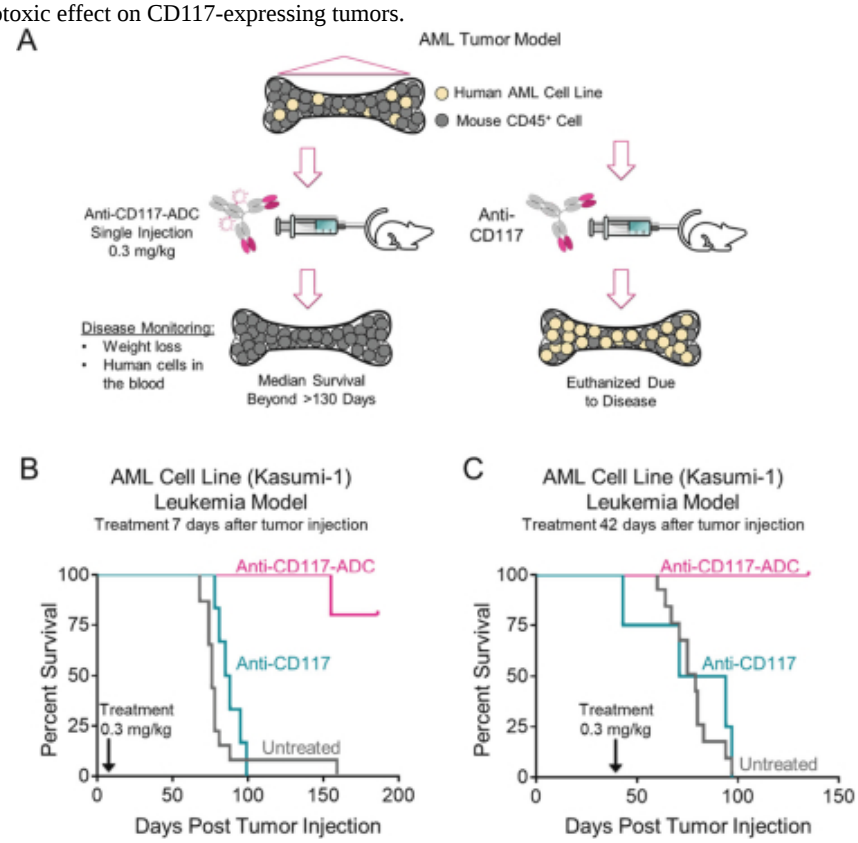
In this ongoing proof-of-mechanism study we observed some instances of transient elevation of liver enzymes that were dose- and toxin-dependent. Out of the 12 non-human primates treated with the probe CD117-ADC, one treated at the highest dose level was euthanized after receiving scheduled pain medication before a planned bone marrow aspiration. In addition, one non-human primate in each of the two highest dose groups showed the anticipated signs of bone marrow failure resulting from HSC depletion and were euthanized prior to the end of the study.

We believe this ongoing study is the first proof of mechanism showing that the probe CD117-ADC can successfully deplete HSCs in non-human primates. These data validate the non-human primate as a suitable model for efficacy and tolerability to guide the further development of our other ADCs in the C200 program. We expect to submit non-human primate data on our C200 program for presentation at future medical meetings.

Anti-tumor activity of CD117-ADC

In addition to its expressions on HSCs, CD117 is also frequently overexpressed on tumor cells in patients with acute myeloid leukemia and myelodysplastic syndromes. Thus the CD117-ADC has the potential to reduce tumor burden in patients with CD117-expressing tumors. In data presented at Tandem in February 2018, we showed that CD117-ADC was effective at killing human HSCs cultured *in vitro* and was also highly potent at killing the human acute myeloid leukemia cell line Kasumi-1. To extend these data, we also assessed the ability of CD117-ADC to reduce tumor burden and confer a survival benefit in mice bearing Kasumi-1 cells. For this study, mice were inoculated with a lethal dose of the Kasumi-1 cells and left either untreated or treated with CD117-ADC or unconjugated CD117 antibody seven days after tumor inoculation. Tumor-bearing mice treated with a single dose of CD117-ADC showed significantly improved survival compared to mice left untreated or those treated with unconjugated CD117 antibody. Treatment at 42 days after tumor inoculation, a time when untreated mice are showing overt signs of tumor toxicity, also led to improved survival with CD117-ADC,

compared to mice that were untreated or treated with unconjugated CD117 antibody. These data suggest that CD117-ADC may have utility to treat leukemias through a direct cytotoxic effect on CD117-expressing tumors.



CD117-ADC effectively depletes human leukemic cells in NSG mice. (A) Schematic of *in vivo* Leukemia model. Kasumi-1 cells were injected into NSG mice to serve as human cell line model of acute myeloid leukemia. A single injection of 0.3 mg/kg anti-CD117 ADC or anti-CD117 antibody occurred on (B) day 7 or (C) day 42 to assess the impact of tumor burden on efficacy. Survival curves of mice after tumor injection are shown.

The targeted conditioning and potential for disease control offered by CD117-ADC may extend bone marrow transplant to additional leukemia patients and improve outcomes. This is especially important as acute myeloid leukemia and myelodysplastic syndromes represent areas of high medical need. Current treatment for patients with high-risk acute myeloid leukemia or myelodysplastic syndromes involves chemotherapy to induce disease remission followed by allogeneic bone marrow transplant. However, many patients are unable to achieve disease remission using current chemotherapy agents, rendering them ineligible for allogeneic transplant. Moreover, in the approximately 35% of eligible patients with acute myeloid leukemia and myelodysplastic syndrome that do receive a transplant, outcomes remain suboptimal with only 50% survival five years after transplant. In addition, many patients have co-morbidities such as increased age or decreased organ function that necessitate the use of a reduced intensity of conditioning which leads to higher rates of disease relapse. Because acute myeloid leukemia and myelodysplastic syndromes are increasingly seen in older patients, many patients are often deemed too frail to undergo a transplant, leaving them with limited treatment options. The anti-leukemia activity of CD117-ADC has the potential to reduce disease burden and improve outcomes for patients with CD117 expressing tumors, and allow relapsed/refractory patients with CD117-expressing tumors to have access to a bone marrow transplant.

Clinical development plans

Given the ability of CD117-ADC to deplete HSCs and CD117-expressing leukemia cells shown in our preclinical data, we intend to pursue a development plan for patients with acute myeloid leukemia and myelodysplastic syndromes. Once we have established a safe and effective dose in that study, we plan to explore multiple indications, including elderly patients with acute myeloid leukemia or myelodysplastic syndromes who are too frail to tolerate current conditioning protocols.

Approximately 47,000 patients in the U.S. and Europe are diagnosed with acute myeloid leukemia every year. Of those patients, about 60% achieve remission with chemotherapy agents and are eligible for transplant. However, of these, only approximately 30 to 40% actually receive a transplant. This is largely due to the toxicity risk associated with current conditioning protocols. We believe our conditioning agents would allow more patients to achieve remission and become eligible for transplant.

Approximately 34,300 patients in the U.S. and Europe are diagnosed with myelodysplastic syndromes every year. Of those patients, about 30% are eligible for transplant based on high risk disease. However, of these patients, only approximately 16 to 40% actually receive a transplant. This is largely due to the toxicity risk associated with current conditioning protocols. We believe our conditioning agents would allow more patients to achieve remission and become eligible for transplant.

We will also explore CD117-ADC in patients with non-malignant diseases, such as sickle cell disease, including those who are undergoing transplant with gene-modified stem cells.

C100 program

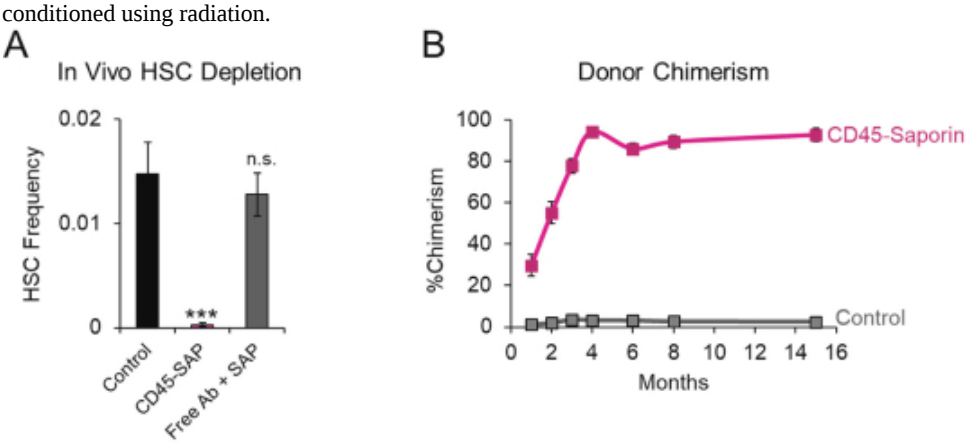
Other ADC-based conditioning programs in our portfolio include C100, a conditioning program with a profile that specifically depletes host HSCs and immune cells. Within our C100 program, our lead target is CD45, an important cell surface molecule broadly expressed throughout the hematopoietic and immune system. We are currently in the lead identification stage for this program and intend to declare a development candidate in 2019.

C100-targeting HSC and immune cells

For many applications of HSC transplant, it is important to eliminate both immune cells and HSCs in the patient prior to transplant. This is especially important in the allogeneic setting where host immune cells can elicit an immune-mediated rejection of the incoming foreign stem cells. In addition, immune cell depletion is a key feature of the use of autologous transplant for the treatment of severe autoimmune disease. In this case, the goal is to eliminate the pathogenic auto-reactive immune cells that perpetuate the underlying autoimmune disease. Lastly, for patients with tumors expressing CD45, there may also be a direct anti-tumor effect providing additional therapeutic benefit. For these reasons, we are developing therapeutics that simultaneously target both HSCs and immune cells.

Pioneering work from Magenta founding scientists demonstrates that HSCs can be successfully targeted using a CD45-ADC to facilitate syngeneic transplant and allow for transplant-mediated cure of a mouse model of sickle

cell disease. Importantly, CD45-ADC-treated mice show greatly reduced levels of organ damage and faster immune cell reconstitution and infection control compared to mice conditioned using radiation.



CD45–SAP has potent cell-depletion activity and enables efficient donor-cell engraftment. (A) CD45–SAP depletes HSCs in C57BL/6 mice whereas non-biotinylated CD45 antibody in the presence of streptavidin– SAP does not. Data represent mean ± s.d. (n = 5 mice/group, one of two independent experiments shown). HSCs were assessed by flow cytometry (Lin-cKit+Sca1+CD48-CD150+). (B) Long-term assessment of peripheral blood chimerism following CD45.2 GFP cell transplantation 8 days post CD45–SAP conditioning; all data points significant vs. control ($P < 0.05$). Data represent mean ± s.d. (n = 5 mice/group, assayed individually).

To translate these initial mouse studies into human therapeutics, we have deployed our biotherapeutics and stem cell biology platforms to discover and develop anti-human CD45 ADCs. These platforms include antibody discovery campaigns to identify high-affinity antibodies able to bind to human CD45 protein and cell lines expressing CD45. Conjugation of these candidate antibodies to select toxins and testing in functional killing assays in cell lines expressing CD45 and human HSCs growing *in vitro* is used to select lead antibodies for characterization *in vivo*. We anticipate nominating a development candidate for the C100 program in 2019.

Clinical development plans

We expect to conduct our initial clinical trials in patients with lymphomas and leukemias. Once we have established a safe and effective dose, we intend to begin testing C100 product candidate(s) in autoimmune diseases, such as multiple sclerosis and scleroderma.

There are approximately 72,000 cases of non-Hodgkin lymphoma diagnosed in the U.S. each year, of which approximately 6,500 are eligible for transplant; and in Europe there are approximately 95,000 new cases of non-Hodgkin lymphoma each year, with 8,500 eligible for transplant. Of these patients, approximately 60 to 80% receive a transplant. Approximately 47,000 patients in the U.S. and Europe are diagnosed with acute myelogenous leukemia every year. Of those patients, about 60% achieve remission with chemotherapy agents and are eligible for transplant. However, of these, only approximately 30 to 40% actually receive a transplant. This is largely due to the toxicity risk associated with current conditioning protocols. We believe our conditioning agents would allow more patients to achieve remission and become eligible for transplant.

Multiple sclerosis is diagnosed in approximately 15,000 patients in the U.S. and 32,000 patients in Europe annually. To assess eligibility in this population, we focused on the patients with active relapsing-remitting disease and relapsing secondary progressive multiple sclerosis patients who are not adequately treated by current therapies. This population represents approximately 45,000 multiple sclerosis patients who switch therapies each year in the U.S., and we believe that a greater population of patients switch therapies each year in Europe. Many

of these patients switch because their current therapy does not adequately control disease activity such as relapses. Given bone marrow transplant's ability to durably eliminate relapses and disease activity in multiple sclerosis patients, we believe a safer transplant procedure would be a viable option for those patients with highly active disease beyond what therapeutics can manage. Currently approximately 1 to 2% of eligible multiple sclerosis patients in the U.S. and Europe receive a bone marrow transplant because the risk of the process outweighs the benefits of a potential cure, and we believe we can significantly expand this number.

Scleroderma, a chronic connective tissue disease that is characterized by thickening of the skin, is diagnosed in approximately 6,600 patients in the U.S. and 10,900 patients in Europe annually. Approximately 35% (2,300 patients in U.S., 3,800 patients in Europe) of scleroderma patients suffer from diffuse cutaneous disease and are therefore eligible for bone marrow transplant. Currently, approximately 1% or less of eligible scleroderma patients in the U.S. and Europe receive a bone marrow transplant, though the recent inclusion of bone marrow transplant in the European League Against Rheumatism, or EULAR, treatment guidelines for scleroderma may increase this number. With this increased acceptance of bone marrow transplant as a treatment option for scleroderma and the opportunity for a safer transplant procedure through targeted conditioning, we believe transplant could become a new standard of care for patients with severe scleroderma, who have no other therapeutic options available.

C300 program

Our third ADC-based conditioning program, C300, targets T cells. T cell depletion is currently performed with highly toxic non-specific drugs, which can lead to immune deficiency, infections and other complications, including secondary autoimmune reactions. We are pursuing targets expressed on the surface of T cells with the goal of offering a safer and more optimized conditioning approach to prevent transplant rejection prior to allogeneic bone marrow transplant, achieve immune system depletion before autologous bone marrow transplant in autoimmune disease patients or condition patients prior to infusion of CAR T therapy for blood cancers,.

Stem cell mobilization program

Unmet need

Successful stem cell transplantation requires collection of HSCs in both sufficient number and quality to allow for robust engraftment, recovery of blood cells, and lifelong maintenance of the hematopoietic system. Higher cell doses are associated with better outcomes in bone marrow transplant.

Current methods for stem cell collection include a bone marrow harvest, a procedure performed under general anesthesia, or mobilization of stem cells from the bone marrow to blood, where they are then collected through a process called apheresis. The autologous transplant field has moved away from bone marrow harvest in recent years, due to the difficulty of the procedure for both patients and physicians, and there is a need for better HSC mobilization agents for apheresis.

The predominant source of HSCs for adult transplant is mobilized peripheral blood that is acquired by apheresis, or collection of donor or patient blood after several days of injections of G-CSF. G-CSF mobilizes stem cells indirectly, requiring repeated daily injections, and is often associated with bone pain, nausea, headache, and fatigue. The multi-day regimen can take up to a week and side effects can be disruptive for both patients having their cells collected for autologous transplants and for healthy volunteers donating their cells for allogeneic transplants. It is difficult to predict whether mobilization will be successful, especially in heavily treated blood cancer patients. In fact, most patients require multiple apheresis sessions and some patients require more than one stem cell collection procedure to obtain a sufficient number of cells for transplant. Mobilization failure rates are as high as 35% in patients with multiple myeloma or non-Hodgkin lymphoma. For patients who are unable to mobilize sufficient numbers of stem cells with G-CSF, physicians are then required to retreat with G-CSF and add another drug, called plerixafor. Plerixafor acts as a small molecule CXCR4 antagonist, blocking a pathway

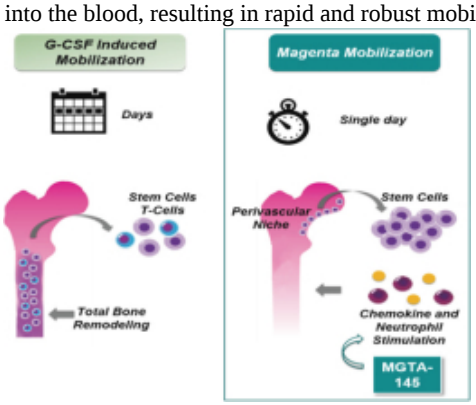
that otherwise plays an essential role in attracting and retaining HSCs in the bone marrow. It is approved for use in combination with G-CSF for patients who fail to achieve sufficient mobilization of stem cells with G-CSF alone. It can mobilize stem cells as a single agent but not to sufficient levels to be used as a standalone agent. In addition, G-CSF is also contra-indicated in some patient populations, such as patients with sickle cell disease, and it can exacerbate autoimmune diseases.

Our solution

MGTA-145 is a first-in-class stem cell mobilization product candidate that was developed based on our understanding of the physiological mechanisms that control stem cell mobilization. The goal of MGTA-145 is to achieve high levels of stem cell mobilization in patients and donors in order to offer a rapid and robust mobilization option that does not require the use of G-CSF, which is the current standard of care. MGTA-145 is a CXCR2 agonist protein that activates neutrophils to release proteases that cause the release of HSCs into the blood. This novel mechanism of action is complementary to that of plerixafor. Preclinical data have shown that the synergistic combination of MGTA-145 and plerixafor leads to robust and rapid stem cell mobilization. Further, these mobilized stem cells outperform stem cells mobilized by G-CSF in mouse transplant models.

Mechanism of action

CXCR2 is a chemokine receptor expressed on the surface of neutrophils. Binding of MGTA-145 to the receptor results in neutrophil activation. Published data from Magenta founders and scientists show that a key event for mobilization of stem cells is the MGTA-145-mediated release of proteases from activated neutrophils, which together with the actions of the CXCR4 antagonist, plerixafor, results in the rapid release of HSCs from the bone marrow into the blood. Blocking CXCR4 using plerixafor and activating neutrophils with MGTA-145 together produce an effective and synergistic untethering and release of HSCs from bone marrow into the blood, resulting in rapid and robust mobilization of HSCs.

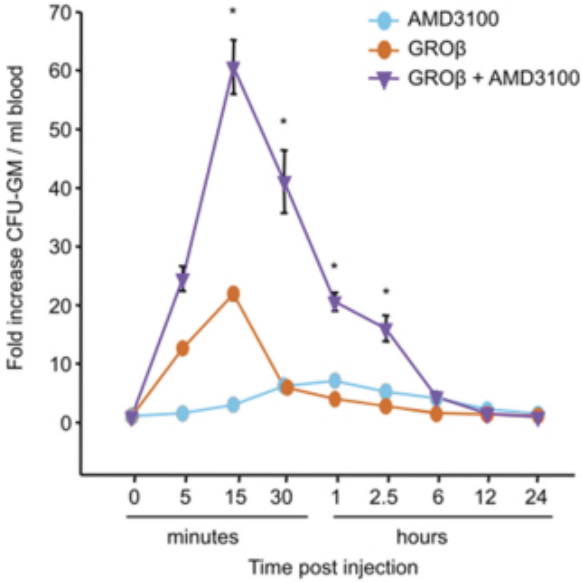


The goal of MGTA-145 is to enable single day mobilization of high numbers of HSCs. Mobilized peripheral blood stem cells are currently the predominant source of hematopoietic stem cells for both autologous and allogeneic transplantation. The most common clinical hematopoietic stem cell mobilization protocol is five days of G-CSF. This regimen requires daily injections, has been associated with bone pain and often results in unpredictably low yields. MGTA-145, in combination with plerixafor, provides a rapid mobilization method that only requires a single treatment and has robust and predictable kinetics. The stem cells mobilized with this combination contain a higher frequency of HSCs compared to those mobilized with G-CSF, which could significantly improve transplant outcomes over the current standard of care.

Preclinical development

Research from Magenta scientific collaborators from Harvard and Massachusetts General Hospital published in *Cell* in December 2017 demonstrates that a single administration of MGTA-145, in combination with plerixafor,

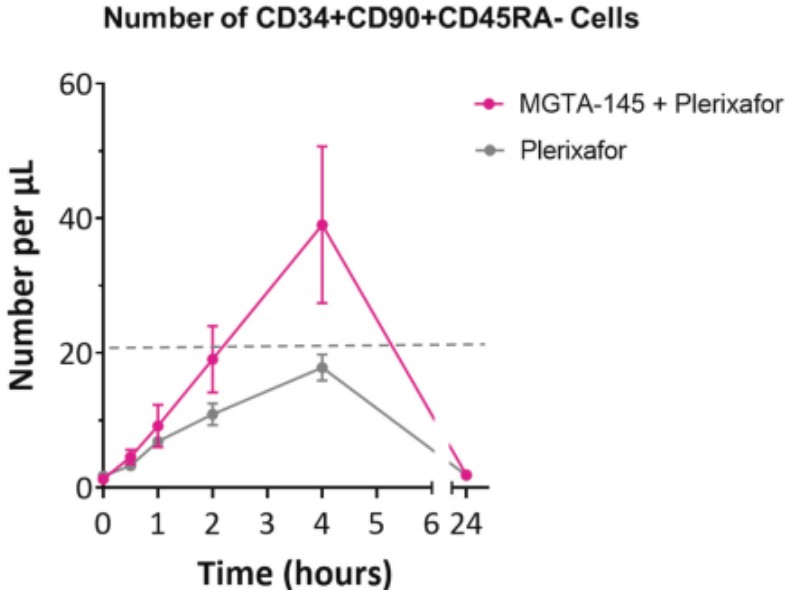
resulted in rapid mobilization of robust numbers of HSCs from the bone marrow and into the blood. The cells were then harvested for transplant in mouse models. Notably, HSCs mobilized with MGTA-145 and plerixafor and subsequently transplanted into mouse models resulted in faster engraftment and higher levels of donor cells, two important factors for the success of a transplant, compared to cells obtained with the current mobilization standard of care, G-CSF.



The combination of MGTA-145 and plerixafor rapidly mobilizes mouse hematopoietic stem cells. Blood was assessed at various time points after administration of Plerixafor (5mg/kg), MGTA-145 (2.5mg/kg) or MGTA-145 plus plerixafor combination given simultaneously. Mean ± SEM from n = 4 BALB/c mice/group/time point. *p < 0.01 versus MGTA-145 or plerixafor ANOVA. (Ref: Hoggatt et al., 2018, Cell 172, 1–14)

In studies in non-human primates, we showed that a single administration of MGTA-145, in combination with plerixafor, induces robust mobilization of a transplantable dose of CD34+CD90+CD45RA- HSCs within four hours of administration. CD34+CD90+CD45RA- cells are highly enriched for HSCs and are important for

long-term engraftment and hematopoietic reconstitution, both of which influence patient outcomes. These data were presented at the ASH annual meeting in December 2017.



CD34+ cells mobilized in response to MGTA-145 + plerixafor contain a high fraction of primitive CD34+ CD90+ CD45RA- stem cells. The absolute numbers of CD34+CD90+CD45RA- hematopoietic stem cells in whole blood by for each treatment group is shown. Data are expressed as mean ± SEM and represent five animals per group. Dotted line represents level of mobilization required to achieve transplantable dose.

Taken together, these data suggest that MGTA-145 with plerixafor offers a more robust, safer and more practical alternative to G-CSF for mobilization of stem cells for use in autologous and allogeneic transplant.

Clinical development plan

Based on the results presented at the ASH annual meeting in December 2017, we have initiated IND-enabling studies of MGTA-145 in combination with plerixafor and expect to file an IND with the FDA for this product candidate in 2019. We plan to develop MGTA-145 for mobilization first in patients with multiple myeloma and non-Hodgkin lymphoma, followed by healthy donors for allogeneic transplant.

There are approximately 30,000 cases of multiple myeloma diagnosed in the U.S. each year, of which approximately 15,000 are eligible for transplant; and in Europe there are approximately 40,000 cases diagnosed each year, with 20,000 eligible for transplant. There are approximately 72,000 cases of non-Hodgkin lymphoma diagnosed in the U.S. each year, of which approximately 7,200 are eligible for transplant; and in Europe there are approximately 95,000 new cases of non-Hodgkin lymphoma each year, with 9,500 eligible for transplant.

In the U.S. approximately 65% of stem cell donors donated through peripheral blood mobilization in 2016. In Europe, 73% of all donors donated through peripheral blood mobilization. The number of patients requiring mobilization may increase as safer transplant conditioning protocols, such as the ones we are developing, increase the number of patients eligible for transplant, including patients with autoimmune or sickle cell disease.

We plan to further investigate MGTA-145 in patient populations where G-CSF can exacerbate the disease, such as autoimmune diseases, and patient populations where G-CSF is contra-indicated, such as sickle cell disease.

Stem cell expansion program: cord blood

Unmet need

Bone marrow transplant is a life-saving procedure with curative potential; however, up to half of the approximately 23,000 patients requiring an allogeneic bone marrow transplant will not find a suitable donor within their families or among the registered bone marrow donors. In addition, long search times for unrelated donors and their frequent unavailability represent a major challenge, particularly for patients with diseases that can progress rapidly, such as high-risk acute leukemia and certain inherited metabolic diseases. Because of the urgency for these patients to undergo transplant, there is a need for new options, and the ability to find a well-matched stem cell donor with sufficient cells remains one of the most significant hurdles in bone marrow transplant.

Challenges in finding a matched donor

The probability of finding a matched donor is influenced by the complexity and frequency of the patient's human leukocyte antigen, or HLA, type in the population and among the 25 million registered bone marrow donors. The HLA is a group of highly variable proteins involved in immune recognition, present on nearly all cells. Differences in HLA genes between the stem cell donor and the patient can result in severe complications, including GvHD, where the donor T cells in the transplant cells attack the patient, or rejection, where the patient T cells attack the donor stem cells, leading to transplant rejection. In bone marrow transplant, donors and patients are typically matched for both copies of four key HLA genes, or eight "loci", with the best results occurring when donor and patient are matched at all eight loci. Patients transplanted with bone marrow stem cells matched at seven of eight loci have inferior outcomes compared to those who matched at eight of eight loci, with an 8% reduction in the probability of survival five years after transplant. Thus, bone marrow transplant is not commonly performed with mismatched bone marrow grafts. The probability of finding a well matched eight of eight donor differs widely depending on the patient's HLA type, which is reflective of their ethnicity. Caucasian patients of western European descent have an approximately 75% probability of identifying an eight of eight matched donor, while patients of African descent have an approximately 16% probability, with other ethnic groups having an intermediate probability.

Opportunities and challenges related to cord blood transplant

For patients who do not have a well-matched donor, umbilical cord blood provides a potential source of suitably matched stem cells. However, despite the proven utility of cord blood transplant, significant challenges remain.

First, even when a patient has a matched cord blood unit, transplants are often not performed because there are too few stem cells in the cord blood unit. Cord blood units are currently selected based on a minimum cell dose threshold per kilogram of patient body weight, with the best HLA match unit selected from among those large enough for use. Since stem cell dose is based on the number of stem cells per kilogram of patient body weight, cord blood is more commonly used in smaller pediatric patients than in adults. Although more than 712,000 frozen cord blood units are available in the worldwide cord blood inventory, current cell dose requirements mean that less than approximately 4% of these units are suitable for use in adult patients. The low number of units available for use in adults negatively impacts the ability to identify a well-matched cord blood unit because the searchable pool of adequately sized units is drastically limited.

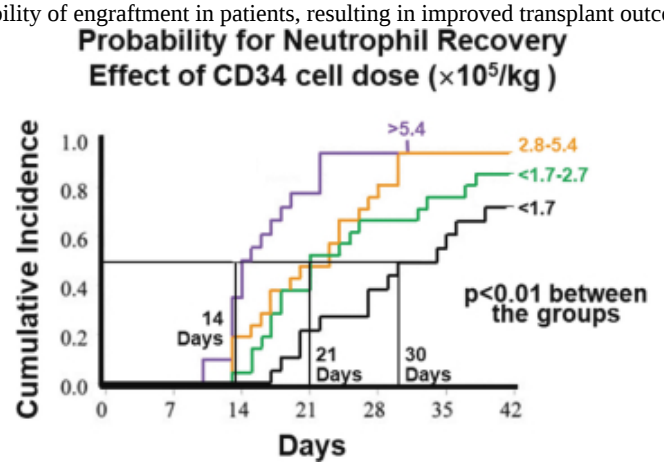
Currently an adult Caucasian patient in the U.S. has an approximately 40% chance of finding a seven of eight matched cord blood unit, and an adult patient of African descent has only an approximately 5% chance.

Secondly, even when a cord blood unit of adequate size is identified, engraftment can be slow and there is an increased risk of life-threatening infections and transplant failure compared to other stem cell sources. These complications result from the low number of stem cells present in cord blood units, since the speed and probability of engraftment are positively correlated with the number of stem cells in the graft. Thus, the higher

the number of stem cells, the faster the engraftment and the lower the likelihood that the patient will experience transplant failure.

The ability to expand HSCs in cord blood has the potential to address the challenge of low cell doses typically obtained from cord blood, and thereby:

- increase the available pool of cord blood units, allowing more patients to obtain better matched cord blood units; and
- improve the speed and probability of engraftment in patients, resulting in improved transplant outcomes.



Wagner et al, Blood 2002; 1611-8

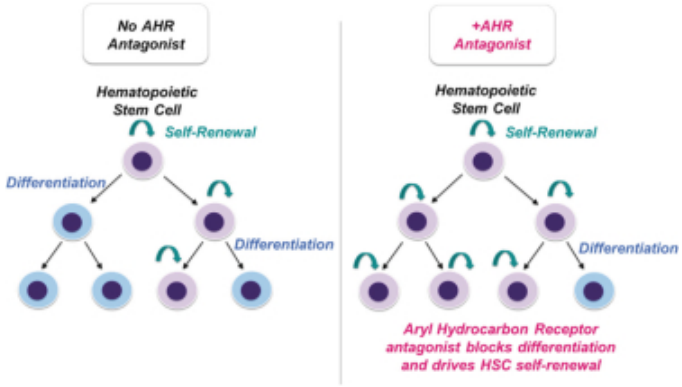
Increase in CD34 cell dose improves engraftment and speed of hematopoietic recovery. Cumulative incidence of neutrophil engraftment after unrelated donor unrelated donor cord blood unit transplantation (n = 102): effect of CD34 cell dose (× 10^5/kg of recipient body weight).

Our solution

MGTA-456, is a first-in-class allogeneic stem cell therapy, produced by expanding a single umbilical cord blood unit *ex vivo* with a proprietary small molecule aryl hydrocarbon receptor, or AHR, antagonist.

Blockade of AHR is a novel, well-studied and clinically validated pathway that controls the self-renewal and differentiation of human HSCs. Growing human HSCs in the laboratory with growth factors leads to cell division; however, this is accompanied by differentiation of the cells into more mature cell types, resulting in the loss of HSCs. Magenta scientists discovered that growth factor treatment activates the AHR pathway, which

leads to differentiation and loss of HSCs. Including an AHR antagonist during HSC culture blocks the AHR pathway, thereby inhibiting differentiation and leading to an increase in the number of HSCs.



Schematic showing the impact of AHR antagonist on stem expansion culture. Purple cells represent HSCs and blue cells represent differentiated, non-HSCs.

The ability to expand HSCs *ex vivo* using an AHR antagonist has the potential to address many of the current challenges of cord blood transplant. Since the speed and probability of engraftment are increased with the number of HSCs within the cord blood unit, increasing the dose of stem cells is predicted to speed engraftment and immune reconstitution, reduce the probability of engraftment failure, allow the use of cord blood in adult patients. In addition, MGTA-456 also has the potential to improve overall survival by allowing more patients to have access to better HLA-matched cord blood units, which is associated with better outcomes and lower rates of post-transplant complications.

We obtained the rights to MGTA-456 through an April 2017 license agreement with Novartis granting us the sole worldwide rights to research, develop and commercialize certain AHR antagonist compounds specifically for the expansion of cord blood-derived non-gene-edited/-modified HSCs.

Clinical history of MGTA-456

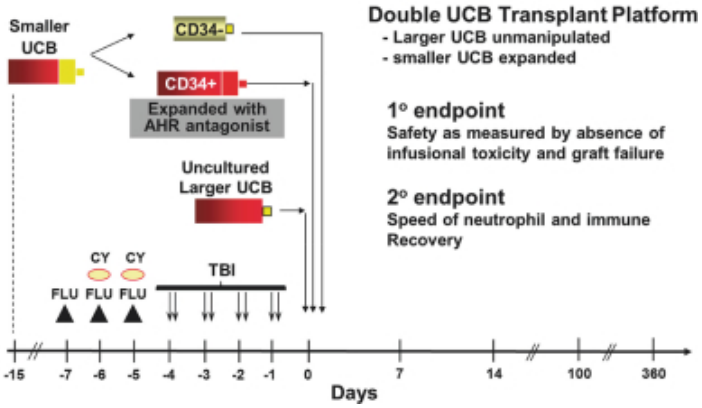
The goal of the first clinical study was to determine if MGTA-456 was safe and could provide more rapid and complete engraftment, and if the engraftment was able to supply long-term (longer than one year) hematopoietic recovery. If MGTA-456 was shown to be a reliable source of engraftable long term HSCs in the double cord blood transplant setting, the product would next be tested as the sole source of HSCs in the single cord blood transplant setting.

Initial first-in-human studies: double blood cord transplant

Initial clinical testing of MGTA-456 was done by Novartis in adult (n=15) and pediatric (n=3) patients with blood cancers conditioned with a myeloablative protocol, which means near-complete elimination of stem cells in the bone marrow. The study focused on the simultaneous transplant of two cord blood units, or double cord blood transplant, where one unit was expanded using the AHR antagonist to produce MGTA-456 and the other unit was unmanipulated. These first-in-human studies used the double cord blood approach primarily for patient safety, to provide a source of HSCs in case the manufacturing process used to produce MGTA-456 led to HSC loss. The simultaneous use of two cord blood units was originally used as a procedure to increase the number of HSCs in adult cord blood transplantation. In this model, immune-mediated rejection of one cord blood unit by the T cells present in the competing unit results in a single unit “winning” and providing long-term engraftment in more than 90% of patients. Clinical trials of double cord blood transplant have shown that while T cells dictate which cord wins, the time to neutrophil engraftment of the winning cord blood is determined by how many HSCs are present in the cord blood unit that wins, with the larger of the two cord blood units winning two-thirds of the time.

For these initial studies, two units were obtained that were matched to the patient and each other, and the smaller of the two units was expanded for 15 days using an AHR antagonist to produce MGTA-456. On the day of transplant, patients received the unmanipulated cord blood unit, followed by MGTA-456 and the previously cryopreserved CD34-depleted fraction matched to MGTA-456. Since MGTA-456 was produced from the smaller unit, the expectation was that one-third of the patients would engraft with MGTA-456, rather than with the unmanipulated cord blood unit.

First-in-Human Clinical Trial – MGTA-456 Trial Design



Schematic of the first in human clinical trial for MGTA-456. On day -15 the smaller umbilical cord blood (UCB) unit is thawed and the CD34+ cells are selected and expanded in the presence of an AHR antagonist. On day -7 to day -1 the patient is conditioned with fludarabine (FLU), cyclophosphamide (CY), and total body irradiation (TBI). On day 0, the larger, unmanipulated UCB unit is infused followed by the expanded CD34+ cells. The following day (day 1), the CD34-fraction is infused.

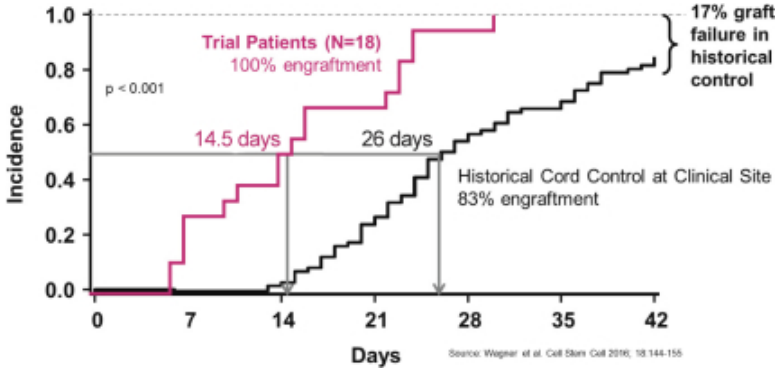
First-in-Human Trial – of MGTA-456
Patient Demographics

Factors		MGTA-456	Historical Control	p
Number		18	121	
Age (yrs)	Median (range)	28 (12-53)	26 (11-51)	0.12
Weight (kg)	Median (range)	87.8 41.6-129.9	70.1 31.6-148.6	0.07
Gender	Male	67%	53%	0.27
Diseases	ALL AML MDS	11 5 2	54 64 3	0.05
Status	% CR1	78%	55%	0.07
CMV sero	Positive	56%	56%	0.96
Karnofsky	90-100	94%	93%	0.98

Demographics of patients treated with MGTA-456 and historical and concurrent controls treated with the same conditioning protocol with single or double unmanipulated cord blood units at the clinical site. The trial based the patient inclusion/exclusion criteria on historical and concurrent controls. Patient demographics were comparable.

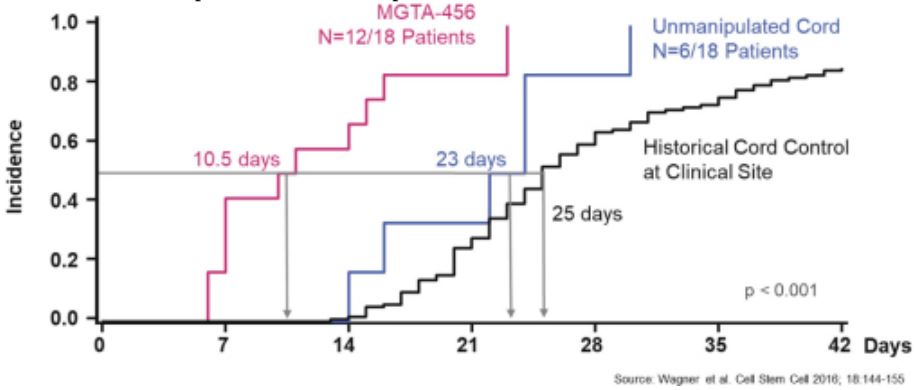
A total of 18 patients were treated and all patients successfully engrafted neutrophils (absolute neutrophil count greater than 500 per mL of blood for 3 days) with a median time to engraftment of 14.5 days – significantly faster

than the 26 days seen in historical and concurrent cord blood transplant recipients treated at the same site with the same myeloablative conditioning protocol. There were no early or late engraftment failures in patients treated with MGTA-456, which represented a marked improvement compared to 17% engraftment failure in the control cohort.



Rate and incidence of neutrophil recovery in recipients of MGTA-456 compared to historical controls (double cord blood transplant)

Of the 18 patients treated in the double cord blood study, the MGTA-456 product predominated in 12 patients and the unmanipulated unit in six. Since MGTA-456 was produced from the smaller unit, the expectation was that only one-third of the patients would engraft with MGTA-456. Patients who engrafted with MGTA-456 recovered neutrophils by 10.5 days, while those who engrafted with the unmanipulated cord blood unit engrafted in 23 days, similar to historical and concurrent controls transplanted with unmanipulated cord blood.



Rate and incidence of neutrophil recovery in patients engrafted with MGTA-456 compared to patients engrafted with unmanipulated cord blood units and historical and concurrent control patients

These published studies demonstrate that MGTA-456 results in rapid and durable engraftment when used in the double cord blood transplant protocol with myeloablative conditioning.

Use of MGTA-456 as a sole stem cell source: single cord blood transplant

Additional clinical trials were undertaken to investigate the ability of MGTA-456 to act as a stand-alone source of stem cells without a second cord blood unit under a range of conditioning protocols. In data presented at the ASH annual meeting in December 2017 from a Phase I/II study, single cord blood units were expanded for 18

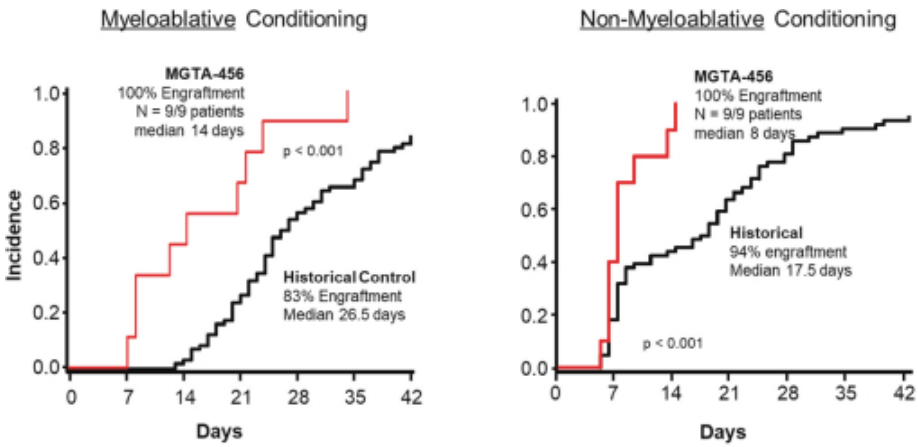
additional adult and adolescent patients with blood cancers. Nine patients underwent a myeloablative conditioning regimen before transplant, and the other nine patients received non-myeloablative conditioning. Patient demographics were similar between MGTA-456 and the control cohorts, except patients in the myeloablative study treated with MGTA-456 were heavier and patients in the non-myeloablative study were older and had a higher risk disease status. These traits suggest more challenging patient populations to treat.

Factors		MGTA-456	Historical Control	P value
Number		9	132	
Age (yrs)	Median (range)	65.0 (29-70)	53 (6-72)	0.03
Weight (kg)	Median (range)	93.4 55-111	81.4 22-145	0.22
Disease	ALL/AML MDS CML/CLL HD/NHL Other	1/0 4 0/1 0/1 2	61 (46%) 25 (19%) 9 (7%) 35 (27%) 2 (2%)	<0.01
Status	High Risk	89%	49%	0.03

Factors		MGTA-456	Historical Control	P value
Number		9	151	
Age (yrs)	Median (range)	25 (15-53)	27 (2-54)	0.13
Weight (kg)	Median (range)	93.8 41-107	66.7 11-136	0.04
Disease	ALL/AML MDS CML/CLL NHL/HD	78% 11% 0 11%	85% 3% 3% 9%	0.63
Status	High	11%	17%	0.67

Demographics of patients in which MGTA-456 was tested as a sole stem cell source (myeloablative top, non-myeloablative bottom)

MGTA-456 successfully engrafted in all 18 patients, with rapid time to neutrophil engraftment and immune recovery regardless of conditioning intensity, as compared to historical and concurrent controls transplanted with unmanipulated cord blood using the same myeloablative or non-myeloablative conditioning protocols. For the myeloablative protocol, all patients transplanted with MGTA-456 engrafted with a median time to neutrophil recovery of 14 days, significantly faster than the 26.5 days seen in historical and concurrent controls transplanted with unmanipulated cord blood using the same myeloablative protocol. Engraftment failure was not observed in any of the patients transplanted with MGTA-456, in contrast to the historical controls where 17% of patients failed to engraft. Among patients conditioned with the non-myeloablative protocol, all patients treated with MGTA-456 engrafted with a median time to neutrophil recovery of eight days, which is significantly faster than the 17.5 days observed in historical controls. There were no early engraftment failures among patients treated with MGTA-456, in contrast to the historical controls where 6% of patients failed to engraft. There were no late engraftment failures in any patient treated with MGTA-456, with a median patient follow-up of two years for all studies, supporting the view that MGTA-456 contains HSCs that retain long-term engraftment.

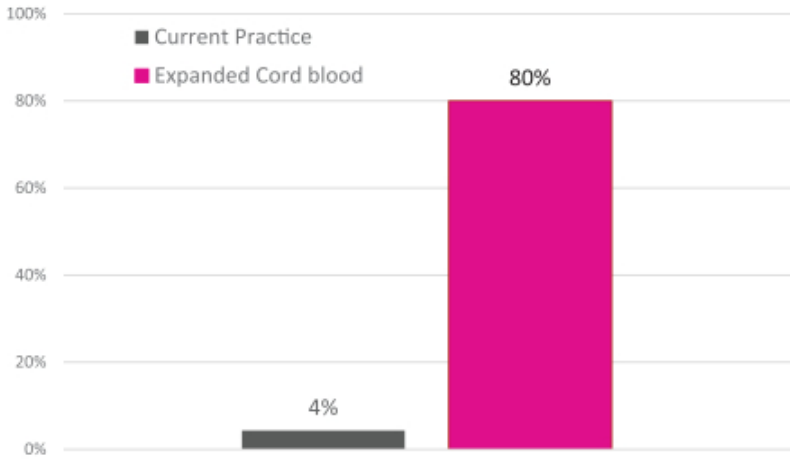


Time to engraftment, as defined by neutrophil recovery, for patients transplanted with MGTA-456 after myeloablative (left) or non-myeloablative (right) conditioning

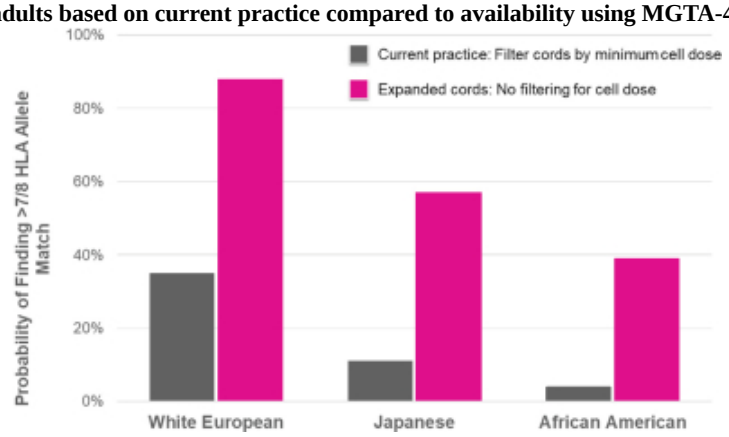
These studies showed rates of acute GvHD and disease relapse with MGTA-456 and overall survival that were comparable to historical cohorts. These preliminary data suggest that MGTA-456 increases the speed and probability of engraftment while preserving the previously reported benefits of cord blood transplant of low acute GvHD, low relapse and favorable overall survival.

Impact of MGTA-456 on cord blood HLA matching

MGTA-456 allows for expansion of smaller units that would otherwise not be suitable for transplant. This effectively increases the available cord blood inventory for adults from approximately 4% of all units to approximately 80%. Analysis of the current cord blood inventory in collaboration with CIBMTR using the lower starting cell dose threshold for MGTA-456 showed that the ability to identify an optimal cord blood unit matched at seven of eight HLA loci increases for all patients. This is particularly improved for patients of African or Japanese ancestry for whom it is especially difficult to find well matched units. Since better matched units yield superior outcomes, the ability to use these smaller well matched units is anticipated to improve transplant outcomes.



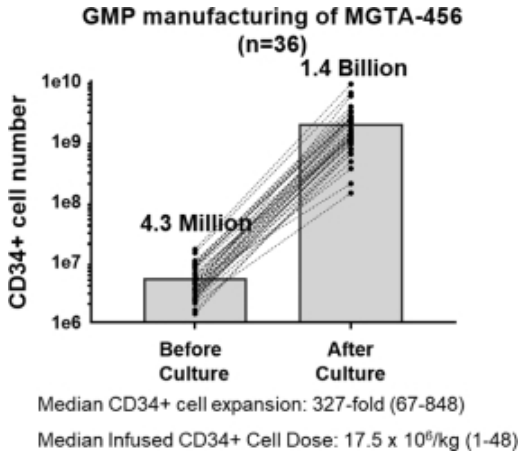
Cord blood unit availability for all adults based on current practice compared to availability using MGTA-456 expanded cords



Impact of lower cell dose threshold for MGTA-456 on the probability of finding a ≥7/8 allele matched cord blood unit for patients of different ethnicities. Current practice minimum cell dose of 25 million total nucleated cells per kg of body weight.

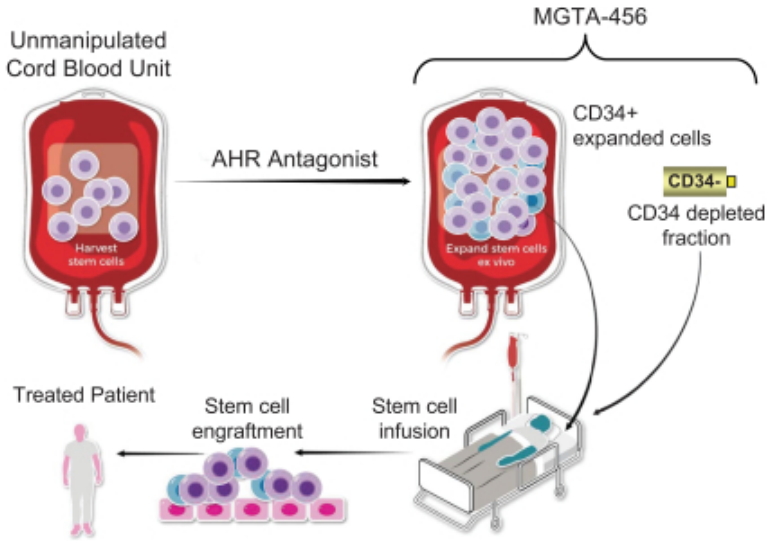
MGTA-456 manufacturing process

MGTA-456 is manufactured at a GMP-certified contract manufacturing facility, which has produced all batches of MGTA-456 used for clinical trials. The manufacturing process involves selection of CD34+ cells which contain the stem cells, from an umbilical cord blood unit matched to the patient to create a CD34-enriched cell fraction and a CD34-depleted cell fraction. The CD34-depleted fraction is cryopreserved following selection and later thawed and infused at the time of transplant. The CD34-depleted fraction contains immune cells that are important for immune recovery and provide a source of donor T cells that can recognize and kill residual tumor cells in the patient when used in patients with blood cancers. The CD34-enriched cells are cultured for 15 days with growth factors that promote cell division and the low molecular weight AHR antagonist to produce MGTA-456. The MGTA-456 manufacturing process results in a median increase in the number of CD34+ cells of 327-fold (range: 67-fold to 848-fold) across all studies.



Summary of clinical manufacturing of MGTA-456, CD34+ cell numbers before and after expansion in 36 clinical manufacturing batches

After culture, the cells are washed, characterized, and re-suspended in human serum albumin solution. MGTA-456 can then be infused directly into the recipient ("fresh" product) or can be mixed with cryopreservation medium, cryopreserved and infused to the patient after thawing. The ability to cryopreserve MGTA-456 should allow for shipment of the product globally. The manufacturing process takes a total of 15 days from receipt of the cord blood unit to product release. The shelf life of the fresh product is 24 hours after manufacturing. The shelf life of the frozen product is up to 90 days. We are currently working with third-party GMP suppliers for our clinical manufacturing process and with commercial contract manufacturing organizations to develop a process for commercial supply.



Schematic of the MGTA-456 manufacturing process. The cord blood unit is thawed and the CD34+ cells are selected and expanded in the presence of an AHR antagonist. Following expansion, the CD34+ cells are infused followed by the CD34-depleted fraction. The HSCs migrate to the bone marrow and rebuild the blood system.

The manufacturing process for MGTA-456 does not require genomic manipulation. The small molecule AHR antagonist used in the MGTA-456 manufacturing process is manufactured under GMP conditions from readily available starting materials in reliable and reproducible synthetic processes that do not require specialized equipment in the manufacturing process.

Clinical development plan

The rapid, robust and consistent engraftment of MGTA-456 in patients with blood cancers suggests that MGTA-456 may also improve engraftment in other patients in whom engraftment failure is a problem. For example, one group of diseases where cord blood transplant is curative is inherited metabolic diseases, specifically, Hurler's syndrome (also referred to as mucopolysaccharidosis-1H or MPS-1H), cerebral adrenoleukodystrophy, metachromatic leukodystrophy and globoid cell leukodystrophy (also referred to as Krabbe disease). Although some of these diseases can be treated with enzyme replacement therapy, this treatment does not halt neurocognitive decline. In contrast, transplant can be curative in these diseases and prevent neurocognitive decline. However, up to 20% of inherited metabolic diseases patients treated with transplant experience engraftment failure, resulting in severe complications, including death. We believe the high number of HSCs present in MGTA-456 will speed engraftment, reduce or eliminate engraftment failure and improve patient outcomes.

According to the U.S. Health Resources and Services Administration database and the European Society for Blood and Marrow Transplantation, there are currently approximately 200 inherited metabolic diseases patients diagnosed each year in the U.S. and Europe. Allogeneic bone marrow transplant is the standard of care for inherited metabolic diseases patients – approximately 80% of inherited metabolic diseases patients are treated with a bone marrow transplant and many receive a cord blood transplant. Transplant volumes for these patients are currently increasing, and additional growth is expected with the adoption of newborn screening and earlier diagnosis for cerebral adrenoleukodystrophy.

In December 2017, we initiated a Phase II study of MGTA-456 in patients with inherited metabolic diseases. The Phase II trial is a single-arm, open-label study designed to evaluate the safety and efficacy of MGTA-456 after myeloablative conditioning in 12 patients with inherited metabolic diseases undergoing bone marrow transplant. The primary endpoint of this study is the incidence of neutrophil engraftment by day 42. In February 2018, we treated the first patient with MGTA-456 in our Phase II study in inherited metabolic diseases.

We anticipate reporting initial data from this study at a major medical meeting in late 2018, and will continue to provide updates on our studies at major medical meetings. If the results from this trial are favorable, we plan to treat additional patients in a registration-enabling trial.

We intend to study MGTA-456 in other conditions where we believe it may bring transformative benefit to patients. We intend to continue to explore MGTA-456 in patients with blood cancers who could benefit from a well-matched stem cell transplant with a high dose of cells. We are in discussions with physician groups and regulatory agencies on the ideal endpoints and comparator treatments to enable clinical trial(s), which could lead to registration. We currently expect these trials to begin in the second half of 2018.

Bone marrow transplant is widely accepted as a curative option for patients with sickle cell disease; however, very few patients are able to find a suitable matched donor or cord blood unit. MGTA-456 may offer the possibility for more patients with sickle cell disease to have access to transplant with high numbers of stem cells from a matched cord blood unit and we intend to initiate a Phase II study in patients with sickle cell disease in early 2019.

Stem cell expansion program: gene-modified HSCs

Unmet need

Bone marrow transplant with gene-modified HSCs, which is referred to as stem cell gene therapy or genome editing, is a promising treatment approach for a number of inherited diseases but is currently limited by the inability to generate a sufficient dose of gene-modified HSCs to achieve clinically meaningful results.

The ability to expand HSCs *ex vivo* has the potential to improve outcomes with gene therapy or genome editing by increasing the dose of genetically modified stem cells. This has been a long-term goal of the field and has the potential to reduce manufacturing costs for these therapies by requiring less viral vector for gene modification of the stem cells. Scaling up vector manufacturing in a cost-effective manner has been a significant challenge for HSC-based gene therapy companies and a significant cost driver. Such cost and capacity issues could limit the commercial viability and widespread deployment of gene therapies. This will only be a bigger challenge as more gene therapies enter the marketplace in the coming years.

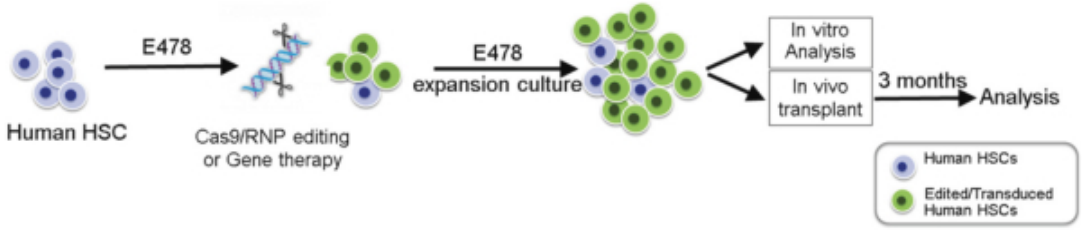
Our solution

We developed the E478 program in response to an unmet technological need recognized by gene therapy and genome editing companies – the challenge of achieving sufficiently high doses of transduced or gene-modified cells. We believe that E478 could represent a key component for unlocking the full value of gene therapy by providing each patient with an optimal dose of gene-modified HSCs for rapid and successful engraftment.

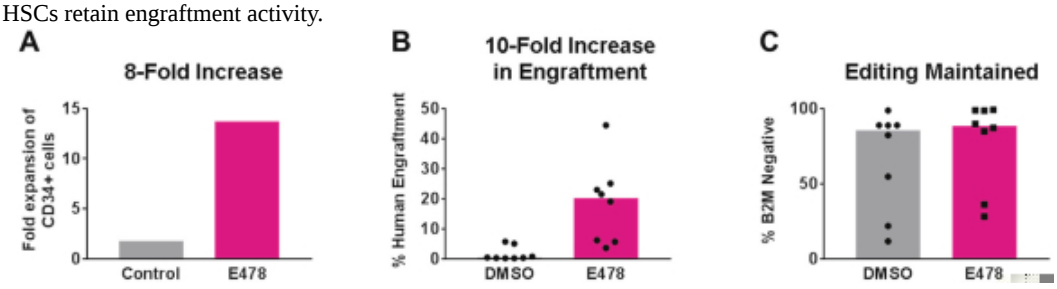
E478 uses the same clinically validated method as MGTA-456, AHR antagonism, to expand HSCs. We are developing E478 specifically to partner with gene therapy and/or genome editing companies to integrate into their manufacturing processes, leading to newly defined cell therapy products.

To demonstrate the utility of E478 for increasing the dose of gene-modified human HSCs that retain engraftment activity, we performed a series of *in vitro* and *in vivo* experiments. We cultured human HSCs for 24 hours prior to gene editing using CRISPR/Cas9 or gene insertion using lentiviral vectors. Following gene modification, we

cultured the cells in the presence of E478 and cytokines for seven days to increase the dose of gene-modified cells. At the end of the culture, we enumerated the number of gene-modified cells and transplanted them into immune-deficient mice. Twelve weeks following transplantation, we determined the number of gene-modified cells present to allow us measure the number of gene modified human HSC that retain engraftment activity.

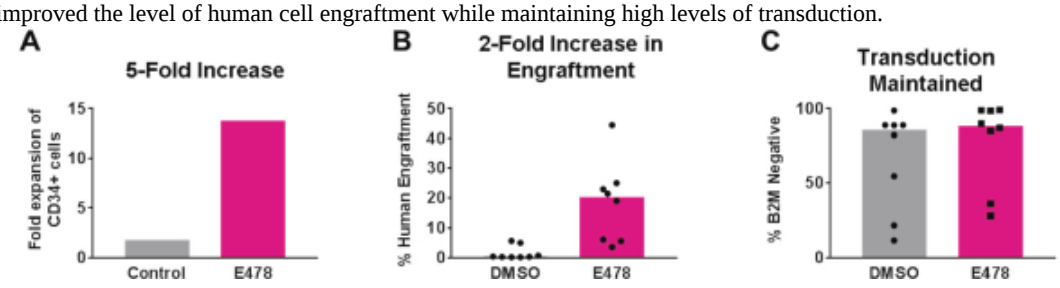


In data we presented at the ASH annual meeting in December 2017, we showed that *in vitro* culture of HSCs with E478 resulted in up to an 8-fold increase in the number of CD34+ cells, a cell population enriched for human HSCs. Transplant of cells expanded with E478 into immune-deficient mice resulted in a 10-fold increase in the number of human cells that engrafted *in vivo* compared to cells cultured in the absence of E478. Importantly, the high levels of editing of the expanded cells obtained during the *in vitro* culture (approximately 80%) were maintained *in vivo*, demonstrating that the expanded and edited HSCs retain engraftment activity.



Expansion and transplantation of edited bone marrow CD34+ cells into NSG mice: Bone marrow-derived CD34+ cells were thawed, edited, and expanded for seven days with (magenta bars) or without (gray bars) E478. (A) Fold expansion of CD34+ cells generated over the seven day culture. (B) Human engraftment and (C) editing rates in the bone marrow of mice as determined by flow cytometry at 16 weeks post-transplant.

We next performed similar experiments designed to evaluate the ability of E478 to increase HSC numbers for HSC based gene therapy. In these studies, human CD34+ cells isolated from G-CSF mobilized peripheral were cultured with cytokines in the presence or absence of E478 and transduced with lentiviral vectors expressing a green fluorescent protein (GFP) to identify cells that were effectively transduced. Inclusion of E478 increased the number of CD34+ cells and improved the level of human cell engraftment while maintaining high levels of transduction.



Expansion and transplantation of transduced peripheral blood derived CD34+ cells into NSG mice: Peripheral-derived CD34+ cells were thawed, transduced, and expanded for seven days with (magenta bars) or without (gray bars) E478. (A) Fold expansion of CD34+ cells generated over the seven-day culture. (B) Human engraftment and (C) editing rates in the peripheral blood of mice as determined by flow cytometry at four weeks post-transplant.

These data demonstrate that E478 can increase the number of gene-modified HSCs that retain the ability to engraft immune deficient mice.

Development plan

We are conducting additional preclinical studies to examine the ability of E478 to expand HSCs transduced with lentiviral vectors. We have shown that E478 can generate higher numbers of long-term engrafting cells compared to other expansion technologies. We have presented *in vitro* and *in vivo* data demonstrating successful expansion of gene-modified HSCs from both bone marrow and mobilized blood and *in vivo* engraftment of the expanded cells modified via lentiviral transduction, CRISPR/Cas9 and other gene-modifying approaches.

We are developing E478 specifically to partner with gene therapy and/or genome editing companies to integrate into their manufacturing processes, leading to newly defined cell therapy products.

Post-transplant complications programs

Unmet need

Approximately half of all bone marrow transplants are allogeneic. GvHD, a reaction that commonly develops after an allogeneic bone marrow transplant, occurs when the transplanted cells see the recipient's body as foreign. The grafted cells then attack their new host. It is the result of the donor T cells not matching the recipient's, and this underscores the importance of HLA matching between the donor and the recipient. If they are not well matched, the donor's T cells recognize the recipient's cells as foreign and attack them. Recipients who receive poorly matched stem cells are at the highest risk of developing this condition. However, GvHD can occur even with proper HLA matching. Acute GvHD typically occurs within the first 100 days following transplant and can severely damage the skin, liver, and gastrointestinal system. It occurs in approximately 50 to 80% of patients receiving an allogenic stem cell transplant, depending on the specific indication, and accounts for approximately 10% of deaths following an allogeneic transplant.

Current treatments for acute GvHD prevention include the prophylactic use of immune suppressive agents that prevent T cell activation, such as cyclosporine or tacrolimus along with mycophenolic acid, first discovered in 1893, which inhibits DNA base synthesis which is required by proliferating T cells or steroids. Despite the use of these powerful immune suppressive agents, most allogeneic transplant patients will experience GvHD. For severe cases, patients are treated with high doses of steroids, immune ablating antibodies or chemotherapy. The use of high-dose non-specific immune suppressive agents for GvHD treatment is correlated with an increased risk of opportunistic and viral infections, poor immune function and is a leading cause of death in allogenic transplant patients.

Our solution

We are developing a unique approach to preventing acute GvHD. Our ADC-based therapeutics are designed to selectively eliminate only the components of the graft that cause acute GvHD, specifically the alloreactive T cells. This ADC therapy is intended to be dosed *in vivo* at the time of transplant and eliminate the activated alloreactive T cells. By specifically targeting the alloreactive T cells that arise shortly after transplant, this therapy should spare the remainder of the immune system to allow immune recovery and protection from opportunistic infections.

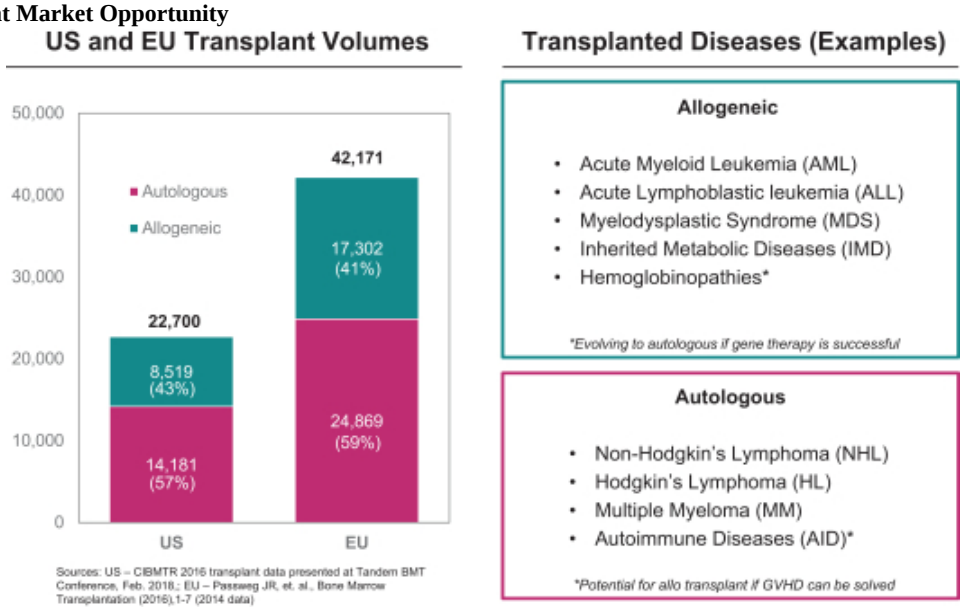
Commercialization Plan

We plan to establish sales, marketing, and commercial product distribution capabilities. Ahead of our first commercial launch, we are building upon relationships with transplant centers and thought leaders, furthering our understanding of the influences on the transplant decision-making process, refining our market research into reimbursement and market access, and leveraging our partnership with Be The Match. Transplants are currently conducted in a small number of specialist sites in the U.S. and Europe. There are approximately 170 transplant centers in the U.S. and approximately 350 transplant centers in Europe, of which 20% (34 in the U.S. and 70 in Europe) of these transplant centers account for greater than 50% of transplant volume. All of our product candidates are focused on the transplant physician as the key prescriber and decision maker.

As we advance our development programs in the U.S. and Europe, we will evaluate our sales and marketing resource needs. In advance of approval of MGTA-456 in the U.S. and Europe, we plan to build out a dedicated transplant-center-focused sales and marketing organization. We intend to leverage the infrastructure developed for MGTA-456 to support commercialization of any additional product candidates in our portfolio for which we gain approval. In addition, we will build upon physicians' familiarity with MGTA-456 to accelerate adoption of our other bone marrow transplant medicines. As additional product candidates advance through our pipeline, our commercial plans may change. In particular, some of our pipeline assets target autoimmune disease indications, which could potentially require commercial reach that captures referring physicians outside of transplant centers.

Our commercial strategy may include the use of strategic partners, distributors, a contract sales force or the establishment of our own commercial structure.

Bone Marrow Transplant Market Opportunity



Bone marrow transplant as it exists today is a large market opportunity with approximately 65,000 procedures performed annually but is poorly served by the existing approaches across all steps. At Magenta, we believe our portfolio of product candidates could not only address deficiencies in existing approaches but also extend the curative power of bone marrow transplant to more patients. Each of our product candidates contributes uniquely to addressing certain unmet needs in bone marrow transplant. By using multiple Magenta products, physicians would be able to tailor the transplant procedure, thereby improving patient outcomes and increasing the potential for every eligible patient to benefit from a bone marrow transplant.

Across diseases where transplant has been shown to result in improved patient outcomes, only a small fraction of eligible patients currently receive a transplant because the risks and challenges outweigh the potential for a cure. Depending on the disease, the barriers for treatment include finding a matched donor, obtaining an adequate cell dose and the morbidity and mortality associated with current conditioning regiments.

The table below lists a number of the diseases where we believe our portfolio of products could allow more patients to benefit from a transplant.

	Examples (US Based)			Examples (Europe Based)		
Disease	Annual Incidence	HSCT-eligible*	HSCTs Performed	Annual Incidence	HSCT-eligible*	HSCTs Performed
NHL	~72K	~6.5k	~4,000 (60% of eligible)	~95K	~8.5k	~7,500 (88% of eligible)
MM	~30K	~15k	~9,000 (60% of eligible)	~40K	~20k	~11,000 (55% of eligible)
AML	~20k	~12.5k	~4,100 (33% of eligible)	~27k	~16.4k	~6,600 (40% of eligible)
MDS	~21k	~6.7k	~1,100 (16% of eligible)	~13.3k	~4.6k	~1,900 (40% of eligible)
SCD	~1.7k	~400	~145 (36% of eligible)	~720	~180	~105 (58% of eligible)
IMD	~100	~100	~78 (78%)	~100	~100	~78 (78%)
MS	~15k**	~2.0-4.5k**	4 (<1% of eligible)	~32k	~3k-7k	~85*** (~1-2% of eligible)
SSc	~6.6k	~2.3k	7 (<1% of eligible)	~10.9k	~3.8k	~42*** (~1% of eligible)

Sources: UpToDate, SEER, HRSA 2015 database, Anthem medical benefit policy, Aetna medical benefit policy, Leukemia Research 2011; 35:1591–1596, CDC MMWR December 12, 2014 / 63(49);1155-1158, Hum Gene Ther. 2016 Aug 16; Eur J Cancer. 2012 Nov;48(17):3257-66, EBMT 2016 Annual Report, Curr Opin Rheumatol. 2012 Mar;24(2):165-70, Curr Res Transl Med. 2016 Apr-Jun;64(2):71-82, CDC MMWR December 12, 2014 / 63(49);1155-1158, Hum Gene Ther. 2016 Aug 16; 2017 ACS Facts & Figures; Bone Marrow Transplantation (2016), 1-7; CIBMTR Data; International Agency for Research on Cancer EUCAN database ; **Biogen Q22016 earnings call, Eur J Neurology. 2006, 13(7):700-22

*** Estimated annual HSCT volume based on difference in all-time transplant volume reported in 2011 and 2015 by EBMT

*HSCT-eligibility

NHL: 1/3 of patients have DLBCL, and 1/3 of patients are relapse/refractory

MM: for patients after primary treatment for more durable response.

AML: ~60% of newly diagnosed patients have a complete response to induction therapy and become eligible for transplant

MDS: ~30% of newly diagnosed patients have IPSS Intermediate-2 or High risk disease

SSc: ~35% of patients have diffuse cutaneous disease

MS: ~5-10% of patients switching therapy are eligible irrespective of diagnosis incidence; 60,000 patients switch per year in US of which ~50% are RRMS, ~30% are relapsing SPMS; 1.5x assumption for Europe based on overall population size US vs. EU

SCD: ~25% of patients have severe disease

IMD: 100% of patients are eligible; increasing numbers of transplants with newborn screening

At Magenta, we are planning to develop our suite of medicines for bone marrow transplant across several indications. These include diseases where bone marrow transplant is currently a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and diseases where the clinical promise for bone marrow transplant is emerging (e.g., autoimmune diseases such as systemic sclerosis and multiple sclerosis).

Blood Cancers: Bone marrow transplant is a standard of care, however a significant number of eligible patients do not receive a transplant because of lack of a matched donor, poor mobilization, and the toxicity of conditioning:

Acute myeloid leukemia, or AML, a cancer arising from myeloid cells, an immature white blood cell found in the bone marrow, is diagnosed in approximately 20,000 patients in the U.S. and 27,000 patients in Europe annually. Approximately 60% (12,500 patients in the U.S., 16,400 patients in Europe) of newly diagnosed patients have a complete response to induction chemotherapy and become eligible for transplant for a more durable remission. However, the current challenges of bone marrow transplant and patient co-morbidities limit transplant to approximately 30 to 40% of those patients who are otherwise eligible.

Myelodysplastic syndromes, or MDS, occurs when the blood-forming cells in the bone marrow become abnormal, leading to low numbers of one or more types of blood cells. It is diagnosed in approximately 21,000 patients in the U.S. and 13,300 patients in Europe annually. Approximately 30% (6,700 patients in the U.S., 4,600 patients in Europe) of newly diagnosed patients have high risk disease and are eligible for bone marrow transplant. However, toxicities of bone marrow transplant and patient co-morbidities limit transplant to approximately 16 to 40% of those patients who are otherwise eligible.

Non-Hodgkin lymphoma, or NHL, a cancer arising from lymphocytes, a type of white blood cell, is diagnosed in approximately 72,000 patients in the U.S. and 95,000 patients in Europe annually. Non-Hodgkin lymphoma represents the most common blood cancer treated by autologous bone marrow transplant. The largest Non-Hodgkin lymphoma subtype is Diffuse Large B-Cell Lymphoma, or DLBCL, comprising approximately 33% of Non-Hodgkin lymphoma. First-line chemotherapy and targeted therapies like rituximab are effective for about two-thirds of DLBCL patients. In the remaining one-third of patients with relapsed/refractory disease, the National Comprehensive Cancer Network recommends autologous bone marrow transplant as one therapeutic option. Therefore, approximately 6,500 newly diagnosed patients in the U.S. and 8,500 patients in Europe are eligible for bone marrow transplant. Currently, approximately 60 to 80% of those eligible Non-Hodgkin lymphoma patients in the U.S. and Europe receive a bone marrow transplant.

Multiple myeloma, or MM, a cancer arising from plasma cells, is diagnosed in approximately 30,000 patients in the U.S. and 40,000 patients in Europe annually. Multiple myeloma represents the second most common blood cancer treated by autologous bone marrow transplant. Approximately 50% (15,000 patients in the U.S., 20,000 patients in Europe) of newly diagnosed patients are eligible for bone marrow transplant. The National Comprehensive Cancer Network recommends bone marrow transplant for patients after primary therapeutic treatment, including novel orals, injectables, and chemotherapy. This recommendation is founded on evidence that autologous bone marrow transplant consistently achieves higher response rates and survival rates than primary treatment alone. However, toxicities of bone marrow transplant and patient co-morbidities limit transplant to approximately 55 to 60% of those patients who are otherwise eligible.

Our conditioning programs, such as C200 and C100, have the potential to provide safer, targeted conditioning for these blood cancer patients who are too frail to tolerate the current conditioning regimens. Our MGTA-145 product candidate has the potential to address the difficult-to-mobilize patients who are suffering from blood cancers as well so that patients can access a robust single-day mobilization regimen. For allogeneic transplant recipients, MGTA-456 offers increased access to a well-matched cord blood unit, with a high cell dose and the higher likelihood of durable clinical outcomes.

Hemoglobinopathies: Bone marrow transplant is clinically accepted but still limited in use due to challenges identifying well-matched donors and conditioning-associated morbidity and mortality. Gene therapy is a promising treatment option but is limited by the same conditioning challenges as well as the ability to obtain a sufficient dose of gene-modified cells.

Sickle cell disease, or SCD, is diagnosed in approximately 1,700 patients in the U.S. and 720 patients in Europe annually. Approximately 25% (400 patients in the U.S., 180 patients in Europe) of patients with sickle cell disease have severe disease and are therefore eligible for bone marrow transplant. Currently, only approximately 36 to 58% of eligible patients with sickle cell disease in the U.S. and Europe receive a bone marrow transplant because it is particularly difficult to find a matched donor and the risk of the procedure often outweighs the benefits of a potential cure.

Beta-thalassemia is diagnosed in approximately 500 patients in the U.S. and 1,500 patients in Europe annually. Approximately 60% (340 patients in the U.S., 1,020 patients in Europe) of patients with beta-thalassemia patients have severe disease, or beta-thalassemia major, and are therefore eligible for bone marrow transplant. Currently, only approximately 23% of eligible beta-thalassemia patients in the U.S. and Europe receive a bone marrow transplant because they are unable to find a matched donor and/or the risk of the process outweighs the benefits of a potential cure.

Our conditioning programs, such as C200, have the potential to provide safer, targeted conditioning for these hemoglobinopathy patients receiving autologous gene therapy or an allogeneic transplant. Our MGTA-145 product candidate has the potential to address patients with sickle cell disease who cannot receive G-CSF because of the risk of triggering sickle cell crises. For the allogeneic transplant recipients, MGTA-456 has the potential to offer higher likelihood of identifying and accessing a well-matched cord blood with a high cell dose, both of which are associated with a higher chance of durable clinical outcomes. E478 uses the same clinically-validated mechanism as MGTA-456 to generate higher doses of gene-modified stem cells.

Autoimmune diseases: emerging data support use of bone marrow transplant as a clinically promising one-time therapy, however the high morbidity and mortality associated with current conditioning regimens limit the uptake of transplant as a therapeutic option.

Multiple sclerosis, or MS, is diagnosed in approximately 15,000 patients in the U.S. and 32,000 patients in Europe annually. To assess eligibility in this population we focused on the patients with active relapsing-remitting disease and relapsing secondary progressive multiple sclerosis patients who are not adequately treated by current therapies. This population represents approximately 45,000 multiple sclerosis patients who switch therapies each year in the U.S. and we believe that a greater population of patients switch therapies each year in Europe. Many of these patients switch because their current therapy does not adequately control disease activity such as relapses. Given bone marrow transplant's ability to durably eliminate relapses and disease activity in multiple sclerosis patients, we believe a safer transplant procedure would be a viable option for those patients with highly active disease beyond what therapeutics can manage. Currently approximately 1 to 2% of eligible multiple sclerosis patients in the U.S. and EU receive a bone marrow transplant because the risk of the process outweighs the benefits of a potential cure and we believe we can significantly expand this number.

Scleroderma, or SSc, a chronic connective tissue disease that is characterized by thickening of the skin, is diagnosed in approximately 6,600 patients in the U.S. and 10,900 patients in Europe annually. Approximately 35% (2,300 patients in the U.S., 3,800 patients in Europe) of scleroderma patients suffer from diffuse cutaneous disease and are therefore eligible for bone marrow transplant. Currently approximately 1% or less of eligible scleroderma patients in the U.S. and Europe receive a bone marrow transplant. However with the addition of bone marrow transplant into the EULAR, treatment guidelines for scleroderma and with the opportunity for a safer transplant procedure, we believe transplant would be a viable option for the severe scleroderma patient population who have no other therapeutic options available.

Our conditioning programs, such as C100 or a combination of C200 and C300, have the potential to provide safer, targeted conditioning for these autoimmune disease patients receiving autologous transplant. We are developing these targeted conditioning approaches to grow the use of transplant in autoimmune disease significantly. In addition, our MGTA-145 product candidate may address the difficult-to-mobilize patients who cannot receive G-CSF because of the risk of triggering autoimmune flares.

Competition

The biotechnology industry is extremely competitive in the race to develop new products and treatment modalities. While we believe we have significant competitive advantages with our industry-leading expertise in transplant medicine, preclinical and clinical development expertise, our comprehensive approach to patient care and intellectual property position, we may face competition for our development programs from companies focused on traditional therapeutic modalities, such as small molecules and antibodies, as well as companies developing next-generation cell therapies. Competition is likely to come from multiple sources, including larger pharmaceutical companies, biotechnology companies and academia. For any products that we may ultimately commercialize, not only will we compete with any existing therapies and those therapies currently in development, we will have to compete with new therapies that may become available in the future. We believe we are the only company that is committed to addressing all of the major limitations and challenges of bone marrow transplant to revolutionize an entire field of medicine. We are building a comprehensive portfolio of

first-in-class therapeutic development programs to address all major unmet medical needs inherent to the existing bone marrow transplant process, which distinguishes us from our competition.

Many of our competitors may have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, clinical trials, regulatory approvals and product marketing than we currently do. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

Bone marrow transplant is used to treat a number of diseases and indications. We are aware of a number of companies that are developing therapeutics, including biologics, small molecules and CAR T therapies that are directed to the treatment of autoimmunity, blood cancers, and genetic diseases that overlap with certain current bone marrow transplant indications. The following competitive overview is focused on companies that are developing technologies to improve the distinct steps of bone marrow transplant.

Competitors in our stem cell expansion programs include the following:

- Gamida Cell Ltd., which is developing a UCB-derived cell product that uses a small molecule to inhibit differentiation and enhance functionality of *ex vivo*-expanded HSCs;
- Nohla Therapeutics, Inc., which is developing a method of *ex vivo* expansion of cord blood stem/progenitor cells resulting in “off-the-shelf” universal donor cellular therapies;
- ExCellThera Inc., which is focused on *ex vivo* expansion of stem cells using a pyrimidoindole-derivative small molecule;
- Angiocrine Bioscience, Inc., which is expanding cord blood and gene-modified HSCs using an endothelial cell feeder layer; and
- Intellia Therapeutics, Inc., which has exclusively licensed from Novartis the AHR antagonist that we use to manufacture MGTA-456 for expansion of gene-modified HSCs only.

Competitors in our conditioning programs include the following:

- Actinium Pharmaceuticals, Inc., which is developing an antibody to CD45 that is linked to radioisotope iodine-131;
- Stanford University, which is developing an antibody to CD117 that is not conjugated to any toxin;

- Forty Seven, Inc., which is developing an anti-CD117 antibody not conjugated to any toxin; and
- Molecular Templates Inc., which is developing an antibody to CD45 that is conjugated to engineered Shiga-toxin.

Competitors in our post-transplant complications programs (acute GvHD) include the following:

- Bellicum Pharmaceuticals, Inc., which is developing a combination of genetically modified T cells and activator agent rimiducid;
- Kiadis Pharma NV, which is developing a single dose donor lymphocyte infusion with functional, mature immune cells from a partially matched family member; and
- Abbvie Inc., which has a Bruton's tyrosine kinase (BTK) inhibitor that is approved for use in chronic GvHD.

Competitors in our mobilization programs include the following:

- BioLineRx Ltd., which is developing BL-8040, a peptide that functions as a high-affinity antagonist for CXCR4.

Manufacturing

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We currently depend on third-party contract manufacturing organizations, or CMOs, for all of our requirements of raw materials, drug substance and drug product for our preclinical research and our ongoing clinical trial of MGTA-456. We have not entered into long-term agreements with our current CMOs. We intend to continue to rely on CMOs for later-stage development and commercialization of MGTA-456, as well as the development and commercialization of any other product candidates that we may identify. Although we rely on CMOs, we have personnel and consultants with extensive manufacturing experience to oversee the relationships with our contract manufacturers.

We believe the synthesis of the AHR antagonist that we use to manufacture MGTA-456 is reliable and reproducible from readily available starting materials, and the synthetic routes are amenable to large-scale production and do not require unusual equipment or handling in the manufacturing process. We acquired data from Novartis related to the chemical synthesis of the AHR antagonist, which has been manufactured by Novartis to satisfy our immediate and near term clinical and preclinical needs. We also acquired data from Novartis related to manufacturing of MGTA-456, which is currently manufactured by a single CMO to satisfy our immediate and near term clinical and pre-commercial needs. Drug product formulation optimization work for MGTA-456 is also in progress with this CMO. We have begun to engage with a second drug product manufacturer for our commercial supply needs for MGTA-456.

Our manufacturing strategy enables us to more efficiently direct financial resources to the research, development, and commercialization of product candidates rather than diverting resources to internally develop manufacturing facilities. As our product candidates advance through development and commercialization, we expect to enter into longer-term commercial supply agreements with key suppliers and manufacturers to fulfill and secure the ongoing and planned preclinical, clinical, and, if our product candidates are approved for marketing, commercial supply needs for ourselves and our collaborators.

Manufacturing of any product candidate is subject to extensive regulations that impose various procedural and documentation requirements, which govern recordkeeping, manufacturing processes and controls, personnel, quality control and quality assurance, among others. We expect that all of our CMOs will manufacture MGTA-456 under current Good Manufacturing Practice, or cGMP, conditions. cGMP is a regulatory standard for the production of pharmaceuticals to be used in humans.

Licenses and Collaborations

Alliance with Novartis

In April 2017, we entered into a license agreement with Novartis International Pharmaceutical Ltd., or Novartis, pursuant to which Novartis granted us an exclusive, worldwide, sublicensable license to research, develop and commercialize certain licensed products that contain Novartis compounds for the expansion of cord blood derived non-Gene-Edited/-Modified HSCs. We refer to this agreement as the Novartis Agreement. The license granted to us under the Novartis Agreement is subject to certain rights retained by Novartis for internal research purposes and certain third parties for research and educational purposes. Certain of the rights licensed to us under the Novartis Agreement are also subject to any retained rights of the U.S. government in the licensed patents. The Novartis Agreement led to the establishment of MGTA-456 as one of our programs. Under the terms of the Novartis Agreement, we are responsible for all research, development, regulatory and commercialization activities related to licensed products. We are required to use commercially reasonable efforts to develop and commercialize licensed products in the U.S., United Kingdom, France, Germany, Spain, Italy and Japan.

Pursuant to the Novartis Agreement, we issued to Novartis 2,500,000 shares of Series A preferred stock and 643,550 shares of Series B preferred stock. We will be required to make milestone payments to Novartis upon dosing the first patient in BLA-enabling clinical trials and upon regulatory approvals of licensed products across ultra-orphan, hemoglobinopathies and other indications. For ultra-orphan indications, we may be required to pay development and regulatory milestones of up to $13.0 million for each of the first two indications, and up to $5.0 million for a third indication. For hemoglobinopathies, we may be required to pay development and regulatory milestones of up to $13.0 million per indication, for the first two indications. For all other indications that are not an ultra-orphan or hemoglobinopathy, we may be required to pay development and regulatory milestones of up to $75.0 million for the first indication and up to $45.0 million for the second indication. Across all licensed products, we may be required to pay Novartis up to $125.0 million in sales milestones, based on the first achievement of certain aggregate worldwide annual net sales thresholds. In addition, Novartis is entitled to receive tiered mid-single digit to double-digit royalties on worldwide net sales of licensed products. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the later of (i) expiration of the last valid claim of a licensed patent right that covers the manufacture, use or sale of such licensed product, or the licensed compound used in the manufacture of such licensed product, in such country and (ii) ten years following the first commercial sale of such licensed product in such country.

Novartis controls the filing, prosecution, maintenance and enforcement of the licensed patent rights at its expense. We have the right to assume these responsibilities should Novartis not wish to pursue them. We own all rights in any intellectual property related to the licensed compound or licensed products that we solely develop under the Novartis Agreement. The Novartis Agreement does not otherwise allocate ownership of improvements developed thereunder; however, Novartis grants us a non-exclusive, royalty-free license to practice any improvements that Novartis owns under the Novartis Agreement in connection with non-gene-edited/-modified HSCs, and we grant a non-exclusive, royalty-free license to Novartis to practice any improvements that we own under the agreement outside of such field.

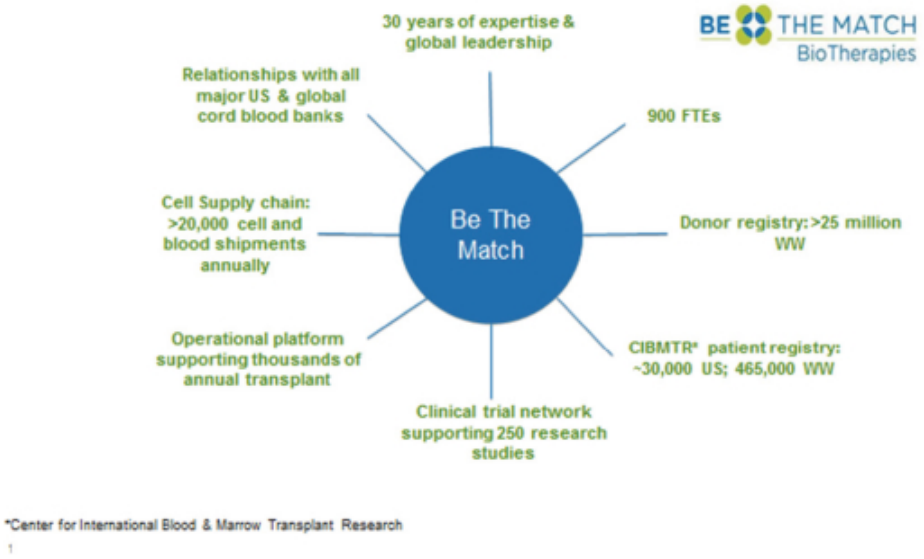
The Novartis Agreement will continue until the last-to-expire royalty term for a licensed product unless terminated earlier by either party. Each party may terminate the Novartis Agreement due to the other party’s insolvency or uncured breach of a material obligation. We have the right to terminate the Novartis Agreement in its entirety or on a product-by-product or country-by-country basis for convenience upon 90 days’ prior written notice to Novartis. Upon termination of the Novartis Agreement by us for convenience or by Novartis for cause, the license granted to us by Novartis will terminate and we will grant a worldwide, perpetual, non-exclusive license to Novartis to develop and commercialize the licensed products under any intellectual property that we (i) control and used in the development, manufacture or commercialization of licensed products or (ii) developed under the agreement to develop and commercialize the licensed products.

Collaboration with Be The Match BioTherapies

In November 2017, we formalized a collaboration agreement with Be The Match BioTherapies, or BTMB, which we refer to as the BTMB Agreement, to advance our relationship developed under a Memorandum of Understanding executed in April 2017. Pursuant to the BTMB Agreement, BTMB grants us priority access to subject matter experts at the National Marrow Donor Program/Be The Match, or NMDP/BTM, the Center for International Blood and Marrow Transplant Research, or CIBMTR, which is an affiliation between the Medical College of Wisconsin and NMDP/BTM, and BTMB for consultation on our clinical development and commercialization needs. The parties may enter into additional riders to the BTMB Agreement from time to time to expand the services that BTMB provides thereunder.

We believe that, through this priority access, the partnership enables us to establish relationships across transplant centers and with transplant physicians, giving us access to clinical strategy and development operational support, and potentially supporting our eventual commercialization efforts across several programs.

Under the BMTB Agreement, we will make quarterly payments to BTMB of $70,000. The parties will renegotiate this amount in good faith after 12 months, if either party believes such fee is not reflective of the services performed. The term of the BTMB Agreement will continue until December 31, 2020 unless terminated earlier by either party. Either party may terminate the BTMB Agreement in whole or in part (i) for convenience upon 60 days' notice, (ii) for the other party's uncured material breach upon ten days' notice or (iii) upon the other party's insolvency.



Harvard University License Agreement

In November 2016, we entered into a license agreement with Harvard University, or Harvard, pursuant to which Harvard granted us the worldwide exclusive, subject to Harvard's retained right solely for research and educational purposes, sublicensable, right, to research, develop and commercialize licensed products under certain conditioning-related and mobilization-related patents. The license granted to us under the Harvard Agreement is also subject to any retained rights of the U.S. government in the licensed patents. Under the terms of the agreement, which we refer to as the Harvard Agreement, we will be responsible for all research, development, regulatory and commercialization activities related to licensed products. We are obligated to use commercially reasonable efforts to commercialize at least two licensed products under the Harvard Agreement, including one for conditioning and one for mobilization.

Pursuant to the Harvard Agreement, we made an upfront payment to Harvard of $85,000 and issued to Harvard and the other co-owners of the licensed patent rights (The General Hospital Corporation d/b/a Massachusetts General Hospital, and Children's Medical Center Corporation) 995,000 shares of our common stock. In addition, we reimbursed Harvard for approximately $300,000 in expenses incurred by Harvard in connection with the licensed patent rights. Harvard is also entitled to receive an annual license maintenance fee of $25,000 for each calendar year through 2019 and $50,000 for each calendar year thereafter until expiration or termination of the Harvard Agreement.

Harvard is entitled to payments upon certain development and regulatory milestones for the first two licensed products of up to $7.4 million per licensed product. In addition, we must pay Harvard low-single digit royalties on net sales of licensed products. If we or our affiliates or sublicensees under the Harvard Agreement commence a legal action to challenge the validity, enforceability or scope of any licensed patents, the royalty rate payable to Harvard will double during the pendency of such proceeding and will remain double thereafter if such action is determined in Harvard's favor. Depending on the type of licensed product, royalties are payable on a product-by-product and country-by-country basis until the later of (i) the last to expire valid claim in the applicable country covering or claiming the composition, manufacture, sale or use of such licensed product and (ii) 12 years from the date of the first commercial sale of such licensed product in such country.

Harvard controls the filing, prosecution and maintenance of the licensed patent rights at our expense. We have the first right, but not the obligation, to enforce licensed patent rights against third-party infringement.

The term of the Harvard Agreement will continue until the later of (i) the expiration of the last to expire valid claim under a licensed patent, and (ii) the expiration of the last royalty period Each party has the right to terminate the Harvard Agreement due to the other party's uncured material breach or insolvency. In particular, Harvard may terminate the Harvard Agreement upon our uncured failure to meet certain development and regulatory milestone deadlines set forth therein. We have the right to terminate the Harvard Agreement for convenience upon 60 days' prior written notice to Harvard. Upon termination of the Harvard Agreement for any reason, the license granted to us by Harvard will terminate.

Research, Development Option and License Agreement with Heidelberg Pharma Research GmbH

In March 2018, we entered into an exclusive research, development option and license agreement with Heidelberg Pharma Research GmbH, or Heidelberg Pharma. We refer to this agreement as the Heidelberg Agreement. Heidelberg Pharma has developed a proprietary antibody targeted amanitin conjugates platform. This collaboration enables our research and development efforts across several targeted conditioning programs through the combination of our proprietary antibodies and Heidelberg Pharma's antibody targeted amanitin conjugates platform.

Under the terms of the Heidelberg Agreement, Heidelberg Pharma has granted to us a worldwide, non-exclusive research license for a one-year period with respect to certain targets set forth in an agreed-to research plan. We have the option to extend such license for up to an additional three years and also have an option to obtain an exclusive target-specific research license, which would expire two years after the exercise of such option. We have exercised this option for two initial targets with signature of the Heidelberg Agreement. In addition, we will have an option to obtain a target-specific exclusive license for global development and commercialization rights to each of the product candidates resulting from the research collaboration. We may obtain such exclusive target-specific rights to up to four targets. We are required to use commercially reasonable efforts to perform our research activities under the Heidelberg Agreement and, if we exercise our right to obtain a development and commercialization license, we are required to use commercially reasonable efforts to pursue development and commercialization of a product directed to the applicable target.

Under the terms of the Heidelberg Agreement, we granted Heidelberg Pharma a worldwide, non-exclusive license under all of our patents and know-how, and any improvements of the foregoing developed under the

Heidelberg Agreement, that are reasonably necessary or useful for Heidelberg Pharma to perform its research activities under the Heidelberg Agreement. In addition, we grant Heidelberg Pharma a worldwide, royalty-free, non-exclusive license under all joint improvements developed under the Heidelberg Agreement for non-clinical research purposes only.

Payment terms to Heidelberg Pharma include an upfront technology access fee, research exclusivity fees with respect to the two initial targets, and payments for research support. Heidelberg Pharma will be entitled to additional fees if we extend the initial research license or if we exercise our research exclusivity options with respect to additional targets. Upon our exercise of an option for an exclusive development and commercialization license, with respect to a target, we are required to make a low single digit million dollar payment to Heidelberg Pharma for each exercised option. In addition, on a per target basis, we may be required to pay development, regulatory and commercial milestones totaling up to approximately $83.5 million per target. We will pay Heidelberg Pharma mid-single digit royalties on a country-by-country and product-by-product basis, on worldwide net product sales of licensed products. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the later of (i) expiration of the last valid claim of a licensed patent right that covers the use, import, offering for sale, or sale of such licensed product in such country, and (ii) ten years following the first commercial sale of such licensed product in such country. We have the option to buy-down royalties at certain points during the development path of each product.

Heidelberg Pharma will own all improvements solely related to the intellectual property rights Heidelberg Pharma licensed to us under the Heidelberg Agreement. We will own all improvements solely related to the intellectual property rights that we licensed to Heidelberg Pharma and all other intellectual property rights developed under the Heidelberg Agreement for which ownership is not otherwise allocated.

Heidelberg Pharma controls the filing, prosecution, maintenance and enforcement of the intellectual property that it licenses to us under the Heidelberg Agreement. We have the right to enforce such licensed intellectual property against infringement if the infringement is competitive with our licensed products and Heidelberg Pharma does not pursue enforcement. We control the filing, prosecution, maintenance and enforcement of the intellectual property we license to Heidelberg Pharma under the Heidelberg Agreement.

The term of the Heidelberg Agreement will continue until the last to expire royalty term unless terminated earlier by either party. Each party has the right to terminate the Heidelberg Pharma Agreement due to the other party’s uncured material breach or insolvency on a product-by-product or target-by-target basis. We have the right to terminate the Heidelberg Agreement for convenience in its entirety or on a product-by-product, target-by-target or country-by-country basis upon 60 days’ prior written notice to Heidelberg Pharma if terminating before the first commercial sale of a product in a country or upon six months’ prior written notice to Heidelberg Pharma if terminating after the first commercial sale of any product directed to such target in such country.

Upon termination of the Heidelberg Agreement in its entirety or with respect to a product or target, all applicable licenses granted to us will terminate immediately.

Bachem Master Development and Manufacturing Agreement

In February 2018, we entered into a Master Development and Manufacturing Agreement with Bachem Americas, Inc., or Bachem. This agreement, which we refer to as the Bachem Agreement, governs several projects related to the development and manufacture of CXCR2 agonists, including MGTA-145, each pursuant to a separate project plan. The active pharmaceutical ingredient of MGTA-145 is a 69 amino acid protein. We selected Bachem as our contract manufacturer for this program based on their deep expertise in the synthesis and production of proteins. We are currently in the process of negotiating project plans pursuant to which Bachem would be responsible for producing batches of MGTA-145 for GLP toxicology studies expected to be completed in 2018, as well as GMP material for the Phase I study of MGTA-145, which is expected to commence in the first quarter of 2019. Financial terms related to this agreement will be determined on a project-by-project basis.

The term of the Bachem Agreement is initially five years and will be automatically renewed for one-year periods unless either party provides the other with written notice of nonrenewal at least three months prior to expiry. Each party may terminate the agreement upon a material uncured breach of the other party. During the term, Bachem will be restricted from producing a pre-defined set of agonists, including MGTA-145, for clinical or commercial use by any third party without our prior written consent, as long as Bachem remains our primary supplier of CXCR2 agonists. Each project plan may be terminated independently of the agreement as a whole.

Clinical Trial Agreement with University of Minnesota

In January 2018, we entered into a Clinical Trial Agreement with the Regents of the University of Minnesota, or UMinn, pursuant to which UMinn will undertake a Phase II clinical trial with MGTA-456 for the treatment of inherited metabolic diseases. Under this agreement, UMinn is also responsible for the manufacture and supply of the required quantities of MGTA-456 for the trial, subject to specified quality assurance provisions.
The term of the agreement will run through the course of the trial, unless earlier terminated. Each party may terminate the agreement immediately upon the other party's material failure to follow the specified protocol for the trial or upon a material uncured breach by the other party.

Intellectual Property

Overview

We strive to protect the proprietary product candidates and technologies that we believe are important to our business, including seeking and maintaining patent protection intended to cover the composition of matter of our product candidates, their methods of use, related technologies, diagnostics and other inventions. As of March 14, 2018, our owned patent portfolio is composed of one Australian patent and approximately ten pending U.S. and foreign patent applications and more than 45 pending U.S. provisional patent applications. In addition, we have licensed more than 150 patents and pending patent applications in the U.S. and foreign jurisdictions.

Patent Rights Relating to Our Targeted Conditioning Program

Our C200 patent portfolio includes two patent families that we own. As of March 14, 2018, the first family, directed to compositions and methods for the depletion of CD117+ cells, includes one granted Australian patent, a pending Patent Cooperation Treaty, or PCT, patent application, and pending patent applications in the U.S. and Australia. Any patents that grant in this first family would be expected to expire in 2037, absent any applicable patent term extensions. As of March 14, 2018, the second family, directed to compositions and methods for the depletion of CD117+ cells, includes approximately 35 pending U.S. provisional patent applications. Any patents that grant from applications claiming priority to these provisional applications would be expected to expire in 2038, absent any applicable patent term extensions.

As of March 14, 2018, our C100 patent portfolio includes one patent family, directed to compositions and methods for the depletion of cells, that we own and consists of a pending PCT patent application and pending patent applications in the U.S. and Australia. Any patents that grant from this family would be expected to expire in 2037, absent any applicable patent term extensions.

As of March 14, 2018, our C300 patent portfolio includes one patent family, directed to compositions and methods for the depletion of cells, that we own and consists of one U.S. provisional patent application. Any patents that grant from applications claiming priority to this provisional application would be expected to expire in 2038, absent any applicable patent term extensions.

In addition, we have licensed two patent families from Harvard directed to compositions and methods for non-myeloablative conditioning. As of March 14, 2018, these families include one pending U.S. patent application and more than ten pending patent applications in foreign jurisdictions. Any patents that grant from these families would be expected to expire between 2036 and 2037, absent any applicable patent term extensions.

We have also licensed patent rights from Heidelberg Pharma that include four patent families directed to amatoxin conjugates, methods of treatment, and methods of synthesizing amatoxins. As of March 14, 2018, these families include more than 70 granted patents and pending patent applications in jurisdictions worldwide. Any patents that grant from these families would be expected to expire between 2030 and 2037, absent any applicable patent term extensions.

Patent Rights Relating to Our Stem Cell Mobilization Program

We own two patent families directed to methods of mobilizing HSCs. As of March 14, 2018, each of these families includes at least one pending U.S. provisional patent application, and any patents that grant from applications claiming priority to the provisional applications in these families would be expected to expire between 2037 and 2038, absent any applicable patent term extensions.

In addition, we have licensed two patent families from Harvard. As of March 14, 2018, the first family, directed to methods and compositions for mobilizing HSCs, includes one pending U.S. patent application and eight pending patent applications in foreign jurisdictions. Any patents that grant from this family would be expected to expire in 2034, absent any applicable patent term extensions. As of March 14, 2018, the second family, directed to highly engraftable hematopoietic stem cells, includes a pending PCT patent application. Any patents that grant from this family would be expected to expire in 2037, absent any applicable patent term extensions.

Patent Rights Relating to Our Stem Cell Expansion Program

With regard to our clinical candidate, MGTA-456, we have licensed one patent family from Novartis directed to AHR antagonists and their use in the expansion of HSCs. As of March 14, 2018, this family includes two issued U.S. patents, one with method claims covering the use of AHR antagonists in the expansion of HSCs and one with composition of matter claims covering AHR antagonists, one pending U.S. patent application, and more than 50 granted patents and pending patent applications in jurisdictions worldwide. The issued U.S. patents are expected to expire in 2032 and 2031, respectively, absent any applicable patent term extensions. The granted foreign patents and any patents that may grant from U.S. and foreign pending patent applications in this family would be expected to expire in 2029, absent any applicable patent term extensions.

Our E478 patent portfolio includes two patent families that we own. As of March 14, 2018, the first family includes three pending U.S. provisional patent applications with composition of matter claims covering E478. As of March 14, 2018, the second family includes four pending U.S. provisional patent applications with method claims covering expansion of gene-edited HSCs. Any patents that grant from applications claiming priority to the U.S. provisional patent applications in these families would be expected to expire in 2038, absent any applicable patent term extensions.

We also own two patent families directed to methods of treatment that are applicable to both our MGTA-456 and E478 programs. As of March 14, 2018, each of these families includes at least one pending U.S. provisional patent application, and any patents that grant from applications claiming priority to the U.S. provisional patent applications in these families would be expected to expire in 2038, absent any applicable patent term extensions.

Patent Rights Relating to Our GvHD Program

We own three patent families directed to compositions and methods for treating GvHD. As of March 14, 2018, the first family includes a pending PCT patent application and three pending patent applications in the U.S., Argentina, and Taiwan. Any patents that grant in this first family would be expected to expire in 2038, absent any applicable patent term extensions. The second family includes a pending U.S. provisional patent application, and any patents that grant from applications claiming priority to this U.S. provisional patent application would be expected to expire in 2039, absent any applicable patent term extensions. The third family includes a pending U.S. provisional patent application, and any patents that grant from applications claiming priority to this U.S. provisional patent application would be expected to expire in 2039, absent any applicable patent term extensions.

As indicated above, most of our owned patent applications are provisional patent applications. Provisional patent applications are not eligible to become issued patents until, among other things, we file a non-provisional patent application within 12 months of filing of one or more of our related provisional patent applications. If we do not timely file any non-provisional patent applications, we may lose our priority date with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. While we intend to timely file non-provisional patent applications relating to our provisional patent applications, we cannot predict whether any such patent applications will result in the issuance of patents that provide us with any competitive advantage. Moreover, the patent application and approval process is expensive and time-consuming. We may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

The term of individual patents depends upon the legal term for patents in the countries in which they are obtained. In most countries in which we have filed, including the U.S., the patent term is 20 years from the earliest filing date of a non-provisional patent application. In the U.S., a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the USPTO in examining and granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier filed patent. The term of a patent that covers a drug or biological product may also be eligible for patent term extension when FDA approval is granted for a portion of the term effectively lost as a result of the FDA regulatory review period, subject to certain limitations and provided statutory and regulatory requirements are met. Any such patent term extension can be for no more than five years, only one patent per approved product can be extended, the extension cannot extend the total patent term beyond 14 years from approval, and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. We may not receive an extension if we fail to exercise due diligence during the testing phase or regulatory review process, fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Moreover, the length of the extension could be less than we request. In the future, if and when our product candidates receive approval from the FDA or foreign regulatory authorities, we expect to apply for patent term extensions on issued patents we may obtain in the future covering those products, depending upon the length of the clinical trials for each product and other factors. There can be no assurance that any of our pending patent applications will issue or that we will benefit from any patent term extension or favorable adjustment to the term of any of our patents.

As with other biotechnology and pharmaceutical companies, our ability to maintain and solidify our proprietary and intellectual property position for our product candidates will depend on our success in obtaining effective patent claims and enforcing those claims if granted. However, our owned and licensed pending patent applications, and any patent applications that we may in the future file or license from third parties may not result in the issuance of patents. We also cannot predict the breadth of claims that may be allowed or enforced in our patents. Any issued patents that we may receive in the future may be challenged, invalidated, infringed or circumvented. In addition, because of the extensive time required for clinical development and regulatory review of a product candidate we may develop, it is possible that, before any of our product candidates can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby limiting the protection such patent would afford the respective product and any competitive advantage such patent may provide. For more information, see the section entitled "Risk Factors—Risks Related to Intellectual Property".

Other IP Rights

In addition to patents, we rely upon unpatented trade secrets and know-how and continuing technological innovation to develop and maintain our competitive position. However, trade secrets and know-how can be difficult to protect. We seek to protect our proprietary information, in part, by executing confidentiality agreements with our collaborators and scientific advisors, and non-competition, non-solicitation, confidentiality, and invention assignment agreements with our employees and consultants. We have also executed agreements requiring assignment of inventions with selected scientific advisors and collaborators. The confidentiality

agreements we enter into are designed to protect our proprietary information and the agreements or clauses requiring assignment of inventions to us are designed to grant us ownership of technologies that are developed through our relationship with the respective counterparty. We cannot guarantee, however, that we have executed such agreements with all applicable counterparties, such agreements will not be breached, or that these agreements will afford us adequate protection of our intellectual property and proprietary rights. For more information, see the section entitled "Risk Factors—Risks Related to Intellectual Property".

Trademarks

We have filed and obtained trademark protection for the MAGENTA THERAPEUTICS character mark and service mark logo for pharmaceutical research and development services and biochemical research and development services. We plan to register trademarks in connection with our future products.

Government Regulation

Government authorities in the U.S. at the federal, state and local level and in other countries regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of drug and biological products, such as MGTA-456 and any future product candidates. Generally, before a new drug or biologic can be marketed, considerable data demonstrating its quality, safety and efficacy must be obtained, organized into a format specific for each regulatory authority, submitted for review and approved by the regulatory authority.

U.S. drug development

In the U.S., the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implementing regulations and biologics under the FDCA, the Public Health Service Act, or PHSA, and their implementing regulations. Both drugs and biologics also are subject to other federal, state and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, and local statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or post-market may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, untitled or warning letters, product recalls or market withdrawals, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement and civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

MGTA-456 and any future product candidates must be approved by the FDA through either a New Drug Application, or NDA, or a Biologics License Application, or BLA, process before they may be legally marketed in the U.S. The process generally involves the following:

- completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice, or GLP, requirements;
- submission to the FDA of an investigational new drug, or IND, application, which must become effective before human clinical trials may begin;
- approval by an institutional review board, or IRB, or independent ethics committee at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations, good clinical practice, or GCP, requirements and other clinical trial-related regulations to establish the safety and efficacy of the investigational product for each proposed indication;

- submission to the FDA of an NDA or BLA;
- a determination by the FDA within 60 days of its receipt of an NDA or BLA to accept the filing for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the drug or biologic will be produced to assess compliance with cGMP requirements to assure that the facilities, methods and controls are adequate to preserve the drug or biologic's identity, strength, quality and purity;
- potential FDA audit of the clinical trial sites that generated the data in support of the NDA or BLA; and
- FDA review and approval of the NDA or BLA, including consideration of the views of any FDA advisory committee, prior to any commercial marketing or sale of the drug or biologic in the U.S.

The preclinical and clinical testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for MGTA-456 and any future product candidates will be granted on a timely basis, or at all.

Preclinical studies and IND

Preclinical studies include laboratory evaluation of product chemistry and formulation, as well as *in vitro* and animal studies to assess safety and in some cases to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for safety/toxicology studies.

An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical trials, among other things, to the FDA as part of an IND. An IND is a request for authorization from the FDA to administer an investigational product to humans, and must become effective before human clinical trials may begin. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time, the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical trials

The clinical stage of development involves the administration of the investigational product to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Furthermore, each clinical trial must be reviewed and approved by an IRB for each institution at which the clinical trial will be conducted to ensure that the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the informed consent form that must be provided to each clinical trial subject or his or her legal representative, and must monitor the clinical trial until completed. There also are requirements governing the reporting of ongoing clinical trials and completed clinical trial results to public registries.

A sponsor who wishes to conduct a clinical trial outside of the U.S. may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor

may submit data from the clinical trial to the FDA in support of an NDA or BLA. The FDA will accept a well-designed and well-conducted foreign clinical study not conducted under an IND if the study was conducted in accordance with GCP requirements, and the FDA is able to validate the data through an onsite inspection if deemed necessary.

Clinical trials generally are conducted in three sequential phases, known as Phase I, Phase II and Phase III, and may overlap.

- Phase I clinical trials generally involve a small number of healthy volunteers or disease-affected patients who are initially exposed to a single dose and then multiple doses of the product candidate. The primary purpose of these clinical trials is to assess the metabolism, pharmacologic action, side effect tolerability and safety of the drug.
- Phase II clinical trials involve studies in disease-affected patients to determine the dose required to produce the desired benefits. At the same time, safety and further pharmacokinetic and pharmacodynamic information is collected, possible adverse effects and safety risks are identified and a preliminary evaluation of efficacy is conducted.
- Phase III clinical trials generally involve a large number of patients at multiple sites and are designed to provide the data necessary to demonstrate the effectiveness of the product for its intended use, its safety in use and to establish the overall benefit/risk relationship of the product and provide an adequate basis for product labeling.

Post-approval trials, sometimes referred to as Phase IV clinical trials, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase IV clinical trials as a condition of approval of an NDA or BLA.

Progress reports detailing the results of the clinical trials, among other information, must be submitted at least annually to the FDA and written IND safety reports must be submitted to the FDA and the investigators for serious and unexpected suspected adverse events, findings from other studies or animal or *in vitro* testing that suggest a significant risk for human subjects and any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure.

Phase I, Phase II and Phase III clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug or biologic has been associated with unexpected serious harm to patients. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether a trial may move forward at designated check points based on access to certain data from the trial. Concurrent with clinical trials, companies usually complete additional animal studies and also must develop additional information about the chemistry and physical characteristics of the drug or biologic as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product and, among other things, companies must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidates do not undergo unacceptable deterioration over their shelf life.

NDA/BLA and FDA review process

Following completion of the clinical trials, data are analyzed to assess whether the investigational product is safe and effective for the proposed indicated use or uses. The results of preclinical studies and clinical trials are then

submitted to the FDA as part of an NDA or BLA, along with proposed labeling, chemistry and manufacturing information to ensure product quality and other relevant data. The NDA or BLA is a request for approval to market the drug or biologic for one or more specified indications and must contain proof of safety and efficacy for a drug or safety, purity and potency for a biologic. The application may include both negative and ambiguous results of preclinical studies and clinical trials, as well as positive findings. Data may come from company-sponsored clinical trials intended to test the safety and efficacy of a product's use or from a number of alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the investigational product to the satisfaction of FDA. FDA approval of an NDA or BLA must be obtained before a drug or biologic may be marketed in the U.S.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each NDA or BLA must be accompanied by a user fee. FDA adjusts the PDUFA user fees on an annual basis. According to the FDA's fee schedule, effective through September 30, 2018, the user fee for an application requiring clinical data, such as an NDA or BLA, is $2,421,495. The sponsor of an approved NDA or BLA is also subject to an annual prescription drug program fee, which for fiscal year 2018 is $304,162. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on NDAs or BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA reviews all submitted NDAs and BLAs before it accepts them for filing, and may request additional information rather than accepting the NDA or BLA for filing. The FDA must make a decision on accepting an NDA or BLA for filing within 60 days of receipt. Once the submission is accepted for filing, the FDA begins an in-depth review of the NDA or BLA. Under the goals and policies agreed to by the FDA under PDUFA, the FDA has ten months, from the filing date, in which to complete its initial review of a new molecular-entity NDA or original BLA and respond to the applicant, and six months from the filing date of a new molecular-entity NDA or original BLA designated for priority review. The FDA does not always meet its PDUFA goal dates for standard and priority NDAs or BLAs, and the review process is often extended by FDA requests for additional information or clarification.

Before approving an NDA or BLA, the FDA will conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with cGMP requirements. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. The FDA also may audit data from clinical trials to ensure compliance with GCP requirements. Additionally, the FDA may refer applications for novel drug products or drug products which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions, if any. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions on approval. The FDA likely will reanalyze the clinical trial data, which could result in extensive discussions between the FDA and the applicant during the review process. After the FDA evaluates an NDA or BLA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug or biologic with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes all of the specific deficiencies in the NDA or BLA identified by the FDA. The Complete Response Letter may require additional clinical data, additional pivotal Phase III clinical trial(s) and/or other significant and time-consuming requirements related to clinical trials, preclinical studies or manufacturing. If a Complete Response Letter is issued, the applicant may either resubmit the NDA or BLA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA or BLA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data.

Orphan drug designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biological product intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the U.S., or more than 200,000 individuals in the U.S. and for which there is no reasonable expectation that the cost of developing and making the product available in the U.S. for this type of disease or condition will be recovered from sales of the product.

Orphan drug designation must be requested before submitting an NDA or BLA. After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same drug for the same indication for seven years from the date of such approval, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity by means of greater effectiveness, greater safety or providing a major contribution to patient care or in instances of drug supply issues. Competitors, however, may receive approval of either a different product for the same indication or the same product for a different indication but that could be used off-label in the orphan indication. Orphan drug exclusivity also could block the approval of one of our products for seven years if a competitor obtains approval before we do for the same product, as defined by the FDA, for the same indication we are seeking approval, or if our product is determined to be contained within the scope of the competitor's product for the same indication or disease. If one of our products designated as an orphan drug receives marketing approval for an indication broader than that which is designated, it may not be entitled to orphan drug exclusivity. Orphan drug status in the European Union has similar, but not identical, requirements and benefits.

Expedited development and review programs

The FDA has a fast track program that is intended to expedite or facilitate the process for reviewing new drugs and biologics that meet certain criteria. Specifically, new drugs and biologics are eligible for fast track designation if they are intended to treat a serious or life threatening condition and preclinical or clinical data demonstrate the potential to address unmet medical needs for the condition. Fast track designation applies to both the product and the specific indication for which it is being studied. The sponsor can request the FDA to designate the product for fast track status any time before receiving NDA or BLA approval, but ideally no later than the pre-NDA or pre-BLA meeting.

Any product submitted to the FDA for marketing, including under a fast track program, may be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. Any product is eligible for priority review if it treats a serious or life-threatening condition and, if approved, would provide a significant improvement in safety and effectiveness compared to available therapies. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug or biologic designated for priority review in an effort to facilitate the review.

A product may also be eligible for accelerated approval, if it treats a serious or life-threatening condition and generally provides a meaningful advantage over available therapies. In addition, it must demonstrate an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, or IMM, that is reasonably likely to predict an effect on IMM or other clinical benefit. As a condition of approval, the FDA may require that a sponsor of a drug or biologic receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials. If the FDA concludes that a drug or biologic shown to be effective can be safely used only if distribution or use is restricted, it will require such post-marketing restrictions, as it deems necessary to assure safe use of the product.

Additionally, a drug or biologic may be eligible for designation as a breakthrough therapy if the product is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over currently approved therapies on one or more clinically significant endpoints. The benefits of breakthrough therapy designation include the same benefits as fast track designation, plus intensive guidance from the FDA to ensure an efficient drug development program.

Fast track designation, priority review, accelerated approval and breakthrough therapy designation do not change the standards for approval, but may expedite the development or approval process.

Pediatric information

Under the Pediatric Research Equity Act, or PREA, certain NDAs and BLAs and certain supplements to an NDA or BLA must contain data to assess the safety and efficacy of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may grant deferrals for submission of pediatric data or full or partial waivers. The Food and Drug Administration Safety and Innovation Act, or FDASIA, amended the FDCA to require that a sponsor who is planning to submit a marketing application for a drug that includes a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration submit an initial Pediatric Study Plan, or PSP, within 60 days of an end-of-Phase II meeting or, if there is no such meeting, as early as practicable before the initiation of the Phase III or Phase II/III study. The initial PSP must include an outline of the pediatric study or studies that the sponsor plans to conduct, including study objectives and design, age groups, relevant endpoints and statistical approach, or a justification for not including such detailed information, and any request for a deferral of pediatric assessments or a full or partial waiver of the requirement to provide data from pediatric studies along with supporting information. The FDA and the sponsor must reach an agreement on the PSP. A sponsor can submit amendments to an agreed-upon initial PSP at any time if changes to the pediatric plan need to be considered based on data collected from preclinical studies, early phase clinical trials and/or other clinical development programs.

Post-marketing requirements

Following approval of a new product, the manufacturer and the approved product are subject to continuing regulation by the FDA, including, among other things, monitoring and record-keeping activities, reporting of adverse experiences, complying with promotion and advertising requirements, which include restrictions on promoting drugs for unapproved uses or patient populations (known as “off-label use”) and limitations on industry-sponsored scientific and educational activities. Although physicians may prescribe legally available drugs for off-label uses, manufacturers may not market or promote such uses. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use. Further, if there are any modifications to the drug or biologic, including changes in indications, labeling or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new NDA/BLA or NDA/BLA supplement, which may require the development of additional data or preclinical studies and clinical trials.

The FDA may also place other conditions on approvals including the requirement for a Risk Evaluation and Mitigation Strategy, or REMS, to assure the safe use of the product. If the FDA concludes a REMS is needed, the sponsor of the NDA or BLA must submit a proposed REMS. The FDA will not approve the NDA or BLA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following initial marketing.

FDA regulations require that products be manufactured in specific approved facilities and in accordance with cGMP regulations. We rely, and expect to continue to rely, on third parties for the production of clinical and

commercial quantities of our products in accordance with cGMP regulations. These manufacturers must comply with cGMP regulations that require, among other things, quality control and quality assurance, the maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved drugs or biologics are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP requirements and other laws. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance. The discovery of violative conditions, including failure to conform to cGMP regulations, could result in enforcement actions, and the discovery of problems with a product after approval may result in restrictions on a product, manufacturer or holder of an approved NDA or BLA, including recall.

Companion diagnostics and complementary diagnostics

We believe that the success of our product candidates may depend, in part, on the development and commercialization of either a companion diagnostic or complementary diagnostic. Companion diagnostics and complementary diagnostics can identify patients who are most likely to benefit from a particular therapeutic product; identify patients likely to be at increased risk for serious side effects as a result of treatment with a particular therapeutic product; or monitor response to treatment with a particular therapeutic product for the purpose of adjusting treatment to achieve improved safety or effectiveness. Companion diagnostics and complementary diagnostics are regulated as medical devices by the FDA and, as such, require either clearance or approval prior to commercialization. The level of risk combined with available controls to mitigate risk determines whether a companion diagnostic device requires Premarket Approval Application, or PMA, approval or is cleared through the 510(k) premarket notification process. For a novel therapeutic product for which a companion diagnostic device is essential for the safe and effective use of the product, the companion diagnostic device should be developed and approved or 510(k)-cleared contemporaneously with the therapeutic. The use of the companion diagnostic device will be stipulated in the labeling of the therapeutic product. This is also true for a complementary diagnostic, although it is not a prerequisite for receiving the therapeutic.

Other regulatory matters

Manufacturing, sales, promotion and other activities following product approval are also subject to regulation by numerous regulatory authorities in the U.S. in addition to the FDA, including the Centers for Medicare & Medicaid Services, other divisions of the Department of Health and Human Services, the Department of Justice, the Drug Enforcement Administration, the Consumer Product Safety Commission, the Federal Trade Commission, the Occupational Safety & Health Administration, the Environmental Protection Agency and state and local governments.

Healthcare providers, physicians, and third party payors will play a primary role in the recommendation and prescription of any products for which we obtain marketing approval. Our future arrangements with third party payors, healthcare providers and physicians may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute any drugs for which we obtain marketing approval. In the U.S., these laws include: the federal Anti-Kickback Statute, the False Claims Act, and the Health Insurance Portability and Accountability Act of 1996, or HIPAA.

The Anti-Kickback Statute, or AKS, makes it illegal for any person, including a prescription drug manufacturer (or a party acting on its behalf), to knowingly and willfully solicit, receive, offer or pay any remuneration, directly or indirectly, in cash or in kind, that is intended to induce or reward referrals, including the purchase, recommendation, order or prescription of a particular drug, for which payment may be made under a federal healthcare program, such as Medicare or Medicaid. Violations of this law are punishable by up to five years in prison, criminal fines, administrative civil money penalties and exclusion from participation in federal healthcare

programs. In addition, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it.

The federal False Claims Act imposes civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities (including manufacturers) for, among other things, knowingly presenting, or causing to be presented false or fraudulent claims for payment by a federal healthcare program or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government. Penalties for a False Claims Act violation include three times the actual damages sustained by the government, plus mandatory civil penalties of between $11,181and $22,363 for each separate false claim, the potential for exclusion from participation in federal healthcare programs and the potential implication of various federal criminal statutes. The government may deem manufacturers to have "caused" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. Claims which include items or services resulting from a violation of the federal Anti-Kickback Statute are false or fraudulent claims for purposes of the False Claims Act. Our future marketing and activities relating to the reporting of wholesaler or estimated retail prices for our products, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party reimbursement for our products, and the sale and marketing of our product and any future product candidates, are subject to scrutiny under this law.

HIPAA, which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters, and, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms and technical safeguards, with respect to maintaining the privacy, security and transmission of individually identifiable health information.

HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose, among other things, specified requirements relating to the privacy, security and transmission of individually identifiable health information held by covered entities and their business associates. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions;

The Physician Payments Sunshine Act of 2010, which requires applicable manufacturers of covered drugs (those paid for by a federal healthcare program) to report to CMS any payments and other transfers of value made to physicians and teaching hospitals.

Analogous state and foreign fraud and abuse laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services. Such laws are generally broad and are enforced by various state agencies and private actions. Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant federal government compliance guidance, and require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures. State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus complicating compliance efforts.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. It is possible that governmental authorities will conclude that our business practices

may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of drugs from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time- and resource-consuming and can divert a company's attention from the business.

Current and Future Legislation

In the U.S. and foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval. We expect that current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we, or any collaborators, may receive for any approved products.

With the new Administration and Congress, there will likely be additional administrative or legislative changes, including modification, repeal, or replacement of all, or certain provisions of, the ACA, which may impact reimbursement for drugs and biologics. For example, in Congress, the U.S. House of Representatives passed Affordable Care Act replacement legislation known as the American Health Care Act of 2017 in May 2017, which was not introduced in the Senate. However, The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Congress may consider other legislation to repeal or replace certain elements of the Affordable Care Act. In addition, since January 2017, President Trump has signed two Executive Orders designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Further, the Trump administration has concluded that cost-sharing reduction, or CSR, payments to insurance companies required under the ACA have not received necessary appropriations from Congress and announced that it will discontinue these payments immediately until such appropriations are made. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA. A bipartisan bill to appropriate funds for CSR payments was introduced in the Senate, but the future of that bill is uncertain. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

Packaging and Distribution in the U.S.

If our products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Products must meet applicable child-resistant packaging requirements under the U.S. Poison Prevention Packaging Act. Manufacturing, sales, promotion and other activities also are potentially subject to federal and state consumer protection and unfair competition laws.

The distribution of pharmaceutical products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage and security requirements intended to prevent the unauthorized sale of pharmaceutical products.

The failure to comply with any of these laws or regulatory requirements subjects firms to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result

in criminal prosecution, fines or other penalties, injunctions, exclusion from federal healthcare programs, requests for recall, seizure of products, total or partial suspension of production, denial or withdrawal of product approvals, or refusal to allow a firm to enter into supply contracts, including government contracts. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. Prohibitions or restrictions on sales or withdrawal of future products marketed by us could materially affect our business in an adverse way.

Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: (i) changes to our manufacturing arrangements; (ii) additions or modifications to product labeling; (iii) the recall or discontinuation of our products; or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

Other U.S. environmental, health and safety laws and regulations

We may be subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. From time to time and in the future, our operations may involve the use of hazardous and flammable materials, including chemicals and biological materials, and may also produce hazardous waste products. Even if we contract with third parties for the disposal of these materials and waste products, we cannot completely eliminate the risk of contamination or injury resulting from these materials. In the event of contamination or injury resulting from the use or disposal of our hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

We maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees, but this insurance may not provide adequate coverage against potential liabilities. However, we do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Current or future environmental laws and regulations may impair our research, development or production efforts. In addition, failure to comply with these laws and regulations may result in substantial fines, penalties or other sanctions.

U.S. patent term restoration and marketing exclusivity

Depending upon the timing, duration and specifics of FDA approval of MGTA-456 and any future product candidates, some of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit restoration of the patent term of up to five years as compensation for patent term lost during product development and FDA regulatory review process. Patent-term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent-term restoration period is generally one-half the time between the effective date of an IND and the submission date of an NDA or BLA plus the time between the submission date of an NDA or BLA and the approval of that application, except that the review period is reduced by any time during which the applicant failed to exercise due diligence. Only one patent applicable to an approved drug is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The U.S. PTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may apply for restoration of patent term for our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant NDA or BLA.

Market exclusivity provisions under the FDCA also can delay the submission or the approval of certain applications. The FDCA provides a five-year period of non-patent marketing exclusivity within the U.S. to the first applicant to gain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application, or ANDA, or a 505(b)(2) NDA submitted by another company for another version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FDCA also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example, new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the conditions of use associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for drugs containing the original active agent. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

An abbreviated approval pathway for biological products shown to be similar to, or interchangeable with, an FDA-licensed reference biological product was created by the Biologics Price Competition and Innovation Act of 2009, or BPCI Act, as part of the Affordable Care Act. This amendment to the PHSA, in part, attempts to minimize duplicative testing. Biosimilarity, which requires that the biological product be highly similar to the reference product notwithstanding minor differences in clinically inactive components and that there be no clinically meaningful differences between the product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical trial or trials. Interchangeability requires that a biological product be biosimilar to the reference product and that the product can be expected to produce the same clinical results as the reference product in any given patient and, for products administered multiple times to an individual, that the product and the reference product may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biological product without such alternation or switch. Complexities associated with the larger, and often more complex, structure of biological products as compared to small molecule drugs, as well as the processes by which such products are manufactured, pose significant hurdles to implementation that are still being worked out by the FDA.

A reference biological product is granted four and twelve year exclusivity periods from the time of first licensure of the product. FDA will not accept an application for a biosimilar or interchangeable product based on the reference biological product until four years after the date of first licensure of the reference product, and FDA will not approve an application for a biosimilar or interchangeable product based on the reference biological product until twelve years after the date of first licensure of the reference product. “First licensure” typically means the initial date the particular product at issue was licensed in the U.S. Date of first licensure does not include the date of licensure of (and a new period of exclusivity is not available for) a biological product if the licensure is for a supplement for the biological product or for a subsequent application by the same sponsor or manufacturer of the biological product (or licensor, predecessor in interest, or other related entity) for a change (not including a modification to the structure of the biological product) that results in a new indication, route of administration, dosing schedule, dosage form, delivery system, delivery device or strength, or for a modification to the structure of the biological product that does not result in a change in safety, purity, or potency. Therefore, one must determine whether a new product includes a modification to the structure of a previously licensed product that results in a change in safety, purity, or potency to assess whether the licensure of the new product is a first licensure that triggers its own period of exclusivity. Whether a subsequent application, if approved, warrants exclusivity as the “first licensure” of a biological product is determined on a case-by-case basis with data submitted by the sponsor.

Pediatric exclusivity is another type of regulatory market exclusivity in the U.S. Pediatric exclusivity, if granted, adds six months to existing regulatory exclusivity periods. This six-month exclusivity may be granted based on the voluntary completion of a pediatric trial in accordance with an FDA-issued "Written Request" for such a trial.

European Union drug development

In the European Union, our future products also may be subject to extensive regulatory requirements. As in the U.S., medicinal products can be marketed only if a marketing authorization from the competent regulatory agencies has been obtained.

Similar to the U.S., the various phases of preclinical and clinical research in the European Union are subject to significant regulatory controls. Although the EU Clinical Trials Directive 2001/20/EC has sought to harmonize the EU clinical trials regulatory framework, setting out common rules for the control and authorization of clinical trials in the EU, the EU Member States have transposed and applied the provisions of the Directive differently. This has led to significant variations in the member state regimes. Under the current regime, before a clinical trial can be initiated it must be approved in each of the EU countries where the trial is to be conducted by two distinct bodies: the National Competent Authority, or NCA, and one or more Ethics Committees, or ECs. Under the current regime all suspected unexpected serious adverse reactions to the investigated drug that occur during the clinical trial have to be reported to the NCA and ECs of the Member State where they occurred.

The EU clinical trials legislation currently is undergoing a transition process mainly aimed at harmonizing and streamlining clinical-trial authorization, simplifying adverse-event reporting procedures, improving the supervision of clinical trials and increasing their transparency. Recently enacted Clinical Trials Regulation EU No 536/2014 ensures that the rules for conducting clinical trials in the EU will be identical.

European Union drug marketing

Much like the Anti-Kickback Statue prohibition in the U.S., the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is also prohibited in the European Union. The provision of benefits or advantages to physicians is governed by the national anti-bribery laws of European Union Member States, such as the UK Bribery Act 2010. Infringement of these laws could result in substantial fines and imprisonment.

Payments made to physicians in certain European Union Member States must be publically disclosed. Moreover, agreements with physicians often must be the subject of prior notification and approval by the physician's employer, his or her competent professional organization and/or the regulatory authorities of the individual European Union Member States. These requirements are provided in the national laws, industry codes or professional codes of conduct, applicable in the European Union Member States. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

European Union drug review and approval

In the European Economic Area, or EEA, which is comprised of the 27 Member States of the European Union (including Norway and excluding Croatia), Iceland and Liechtenstein, medicinal products can only be commercialized after obtaining a Marketing Authorization, or MA. There are two types of marketing authorizations.

- The Community MA is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use, or CHMP, of the European Medicines Agency, or EMA, and is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as biotechnology medicinal products, orphan medicinal products, advanced-therapy medicines such as gene-therapy, somatic cell-therapy or

tissue-engineered medicines and medicinal products containing a new active substance indicated for the treatment of HIV, AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and other immune dysfunctions and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU.

- National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member States through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure. Under the Decentralized Procedure an identical dossier is submitted to the competent authorities of each of the Member States in which the MA is sought, one of which is selected by the applicant as the Reference Member State, or RMS. The competent authority of the RMS prepares a draft assessment report, a draft summary of the product characteristics, or SPC, and a draft of the labeling and package leaflet, which are sent to the other Member States (referred to as the Member States Concerned) for their approval. If the Member States Concerned raise no objections, based on a potential serious risk to public health, to the assessment, SPC, labeling, or packaging proposed by the RMS, the product is subsequently granted a national MA in all the Member States (i.e., in the RMS and the Member States Concerned).

Under the above described procedures, before granting the MA, the EMA or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

European Union new chemical entity exclusivity

In the European Union, new chemical entities, sometimes referred to as new active substances, qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. The data exclusivity, if granted, prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. The overall ten-year period will be extended to a maximum of 11 years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are determined to bring a significant clinical benefit in comparison with currently approved therapies.

European Union orphan designation and exclusivity

In the European Union, the EMA's Committee for Orphan Medicinal Products grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of life-threatening or chronically debilitating conditions affecting not more than 5 in 10,000 persons in the European Union community (or where it is unlikely that the development of the medicine would generate sufficient return to justify the investment) and for which no satisfactory method of diagnosis, prevention or treatment has been authorized (or, if a method exists, the product would be a significant benefit to those affected).

In the European Union, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers and ten years of market exclusivity is granted following medicinal product approval. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity. Orphan drug designation must be requested before submitting an application for marketing approval. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

European Data Collection

The collection and use of personal health data in the European Union is governed by the provisions of the Data Protection Directive, and as of May 2018 the General Data Protection Regulation, or GDPR. These directive imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, notification of data processing obligations to the competent national data protection authorities and the security and confidentiality of the personal data. The Data Protection Directive and GDPR also impose strict rules on the transfer of personal data out of the European Union to the U.S. Failure to comply with the requirements of the Data Protection Directive, the GDPR, and the related national data protection laws of the European Union Member States may result in fines and other administrative penalties. The GDPR introduces new data protection requirements in the European Union and substantial fines for breaches of the data protection rules. The GDPR regulations may impose additional responsibility and liability in relation to personal data that we process and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects.

Rest of the world regulation

For other countries outside of the European Union and the U.S., such as countries in Eastern Europe, Latin America or Asia, the requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. Additionally, the clinical trials must be conducted in accordance with GCP requirements and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Additional laws and regulations governing international operations

If we further expand our operations outside of the U.S., we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering, authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the U.S. to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the U.S., or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. If we expand our presence outside of theU.S., it will require us to dedicate additional resources to comply with these laws, and these laws may preclude us from developing, manufacturing, or selling certain products and product candidates outside of the U.S., which could limit our growth potential and increase our development costs.

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The Securities and Exchange Commission, or SEC, also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

Reimbursement

Sales of our products will depend, in part, on the extent to which our products will be covered by third-party payors, such as government health programs, commercial insurance and managed healthcare organizations. In the U.S., no uniform policy of coverage and reimbursement for drug or biological products exists. Accordingly, decisions regarding the extent of coverage and amount of reimbursement to be provided for any of our products will be made on a payor-by-payor basis. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained.

The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price-controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. For example, the Affordable Care Act contains provisions that subject biological products to potential competition by lower-cost biosimilars and may reduce the profitability of drug products through increased rebates for drugs reimbursed by Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Adoption of general controls and measures, coupled with the tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceutical drugs.

The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the Secretary of the Department of Health and Human Services as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. The Affordable Care Act made several changes to the Medicaid Drug Rebate Program, including increasing pharmaceutical manufacturers' rebate liability by raising the minimum basic Medicaid rebate on most branded prescription drugs from 15.1% of average manufacturer price, or AMP, to 23.1% of AMP and adding a new rebate calculation for "line extensions" (i.e., new formulations, such as extended release formulations) of solid oral dosage forms of branded products, creating a new methodology by which rebates owed by are calculated for drugs that are inhaled, infused, instilled, implanted or injected, as well as potentially impacting their rebate liability by modifying the statutory definition of AMP. The Affordable Care Act also expanded the universe of Medicaid utilization subject to drug rebates by requiring pharmaceutical manufacturers to pay rebates on Medicaid managed care utilization and by enlarging the population potentially eligible for Medicaid drug benefits. Pricing and rebate programs must also comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990.

The Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or the MMA, established the Medicare Part D program to provide a voluntary prescription drug benefit to Medicare beneficiaries. Under Part D, Medicare beneficiaries may enroll in prescription drug plans offered by private entities that provide coverage of outpatient prescription drugs. Unlike Medicare Part A and B, Part D coverage is not standardized. While all Medicare drug plans must give at least a standard level of coverage set by Medicare, Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level. However, Part D prescription drug formularies must include drugs within each therapeutic category and class of covered Part D drugs, though not necessarily all the drugs in each category or class. Any formulary used by a Part D prescription drug plan must be developed and reviewed by a pharmacy and therapeutic committee. Government payment for some of the costs of prescription drugs may increase demand for products for which we receive marketing approval. However, any

negotiated prices for our products covered by a Part D prescription drug plan likely will be lower than the prices we might otherwise obtain. Moreover, while the MMA applies only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own payment rates. Any reduction in payment that results from the MMA may result in a similar reduction in payments from non-governmental payors.

For a drug product to receive federal reimbursement under the Medicaid or Medicare Part B programs or to be sold directly to U.S. government agencies, the manufacturer must extend discounts to entities eligible to participate in the 340B drug pricing program. The required 340B discount on a given product is calculated based on the AMP and Medicaid rebate amounts reported by the manufacturer. As of 2010, the Affordable Care Act expanded the types of entities eligible to receive discounted 340B pricing, although, under the current state of the law, with the exception of children's hospitals, these newly eligible entities will not be eligible to receive discounted 340B pricing on orphan drugs. In addition, as 340B drug pricing is determined based on AMP and Medicaid rebate data, the revisions to the Medicaid rebate formula and AMP definition described above could cause the required 340B discount to increase.

As noted above, the marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. An increasing emphasis on cost containment measures in the U.S. has increased and we expect will continue to increase the pressure on pharmaceutical pricing. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

In recent years, additional laws have resulted in direct or indirect reimbursement reductions for certain Medicare providers.

- The Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and will remain in effect through 2027 unless additional Congressional action is taken.
- The American Taxpayer Relief Act of 2012, among other things, reduced Medicare payments to several providers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.
- The Middle Class Tax Relief and Job Creation Act of 2012 required that the Centers for Medicare & Medicaid Services reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which served as a base for 2014 and subsequent years. In addition, effective January 1, 2014, CMS also began bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting.

These laws, and future state and federal healthcare reform measures may be adopted in the future, any of which may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our product candidates for which we may obtain regulatory approval or the frequency with which any such product candidate is prescribed or used.

In addition, in most foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of

medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. In some countries, we may be required to conduct a clinical study or other studies that compare the cost-effectiveness of any of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the European Union do not follow price structures of the U.S. and generally prices tend to be significantly lower. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If pricing is set at unsatisfactory levels or if reimbursement of our products is unavailable or limited in scope or amount, our revenues from sales by us or our strategic partners and the potential profitability of any of our product candidates in those countries would be negatively affected.

Employees

As of February 28, 2018, we had 44 full-time employees, 19 of our employees have Ph.D. or M.D. degrees and 28 of our employees are engaged in research and development activities. None of our employees are represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

Facilities

We lease a facility containing our research and development, laboratory and office space, which consists of approximately 12,500 square feet located at 50 Hampshire Street, Cambridge, Massachusetts. Our lease expires in August 2018.

Legal Proceedings

As of the date of this prospectus, we were not party to any material legal matters or claims. In the future, we may become party to legal matters and claims arising in the ordinary course of business, the resolution of which we do not anticipate would have a material adverse impact on our financial position, results of operations or cash flows.

MANAGEMENT

Executive Officers, Significant Employees and Directors

The following table sets forth certain information about our executive officers, significant employees and directors, including their ages as of December 31, 2017.

Name	Age	Position(s)
Executive Officers:		
Jason Gardner, D.Phil.	46	Director, President and Chief Executive Officer
Michael P. Cooke, Ph.D.	56	Chief Scientific Officer
John C. Davis, Jr., M.D.	55	Chief Medical Officer
Christina K. Isacson, Ph.D.	39	Chief Business Officer
Zoran Zdraveski, J.D., Ph.D.	48	Secretary, Senior Vice President and Chief Legal Officer
Significant Employees:		
Cindy Driscoll	52	Vice President, Finance
Non-Employee Directors:		
Jeffrey Albers	46	Director
Michael W. Bonney	59	Director
Bruce Booth, D.Phil.	43	Director
Alexis A. Borisy	46	Director
Blake Byers, Ph.D.	32	Director
Thomas O. Daniel, M.D.	64	Director
Amy L. Ronneberg	44	Director
David T. Scadden, M.D.	64	Director

(1) Member of the Audit Committee.
(2) Member of the Compensation Committee.
(3) Member of the Nominating and Corporate Governance Committee.

Executive Officers and Significant Employees

Jason Gardner, D.Phil. has served as our President and Chief Executive Officer and as a member of our board of directors since February 2016. Dr. Gardner has more than 20 years of experience in stem cell science and industry leadership roles. He joined Atlas Venture in November 2015 as an Entrepreneur-in-Residence to create Magenta with Third Rock Ventures. He previously worked at GlaxoSmithKline plc. from 2005, most recently as Vice President and Head of the R&D Satellite in Boston. He created and led the Regenerative Medicine Unit, established partnerships with The Harvard Stem Cell Institute, and The Telethon Institute for Gene Therapy, from which the first stem cell gene therapy (Strimvelis) was approved. Prior to that, Dr. Gardner was the Head of the Center of Excellence for External Drug Discovery and was a member of the clinical project team that led the late stage development and NDA approval for Tykerb for breast cancer. Dr. Gardner currently serves on the board of directors of Obsidian Therapeutics, Inc. Dr. Gardner completed a postdoctoral fellowship in stem cell biology with Professor David Scadden at Harvard Medical School. He was educated in the U.K. and holds a doctorate from Oxford University, and graduate and undergraduate degrees in Natural Sciences (Biochemistry) from Cambridge University. Dr. Gardner is qualified to serve on our board of directors because of his insight into our operations and strategy as a result of being our Chief Executive Officer and his experience in the life sciences industry.

Michael P. Cooke, Ph.D. has served as our Chief Scientific Officer since July 2016. Dr. Cooke has more than 25 years of experience in biotechnology and large pharma where he has been responsible for the discovery and development of a portfolio of products to treat autoimmune disease, enhance vaccines, and improve hematopoietic stem cell transplant, including several products that are in clinical development. Prior to joining Magenta, Dr. Cooke worked at Novartis from July 1999 to June 2016, most recently as the Executive Director of

Immunology at their La Jolla research campus. Prior to Novartis, Dr. Cooke worked at SyStemix Inc. from 1993 to 1999, a biotechnology company focused on hematopoietic stem cells, where he was the Director of Functional Genomics. Dr. Cooke is an author on more than 60 peer-reviewed publications focused on using genetics and genomics to study the biology of hematopoietic stem cells and the immune system and translating these findings into novel therapeutics to improve patient outcomes. Dr. Cooke received his Ph.D. in Biochemistry from the University of Washington with Dr. Roger Perlmutter and completed postdoctoral work with Dr. Chris Goodnow at Stanford University.

John C. Davis, Jr., M.D. has served as our Chief Medical Officer since February 2018. Prior to joining Magenta, Dr. Davis was Senior Vice President and Head of Early Clinical Development at Pfizer Inc. from 2016 to 2018. Prior to his role at Pfizer, Dr. Davis served as Vice President and Global Therapeutic Area Head of Immunology at Baxalta which is now wholly-owned by Shire plc, from 2015 to 2016. Dr. Davis had multiple roles at Genentech from 2007 to 2015 and ultimately was Senior Group Director and Head of the Inflammation and Cardiovascular/Metabolism Group in the Early Clinical Development Group. Dr. Davis spent nearly 10 years on faculty at The University of California San Francisco leading clinical research in autoimmune diseases, and he is Professor of Clinical Medicine. He continues to see patients, teach, and serve as volunteer faculty at the Boston VA Medical Center. Dr. Davis earned an MD from the University of Maryland. Dr. Davis trained in Internal Medicine and Rheumatology at The University of California San Francisco. He continued training in clinical research and rheumatology at The National Institutes of Health NIAMS Intramural Program. He holds a Masters in Public Health in Epidemiology from the University of California Berkeley, and a Master of Science in Anatomy from the University of Maryland School of Medicine.

Christina K. Isacson, Ph.D. joined Magenta in July 2016 and has served as our Chief Business Officer since January 2018. Dr. Isacson has over 13 years of experience in senior business development in biotechnology companies and company creation. Dr. Isacson is responsible for Magenta's business and corporate development, and the establishment and management of partnerships. Dr. Isacson joined Third Rock Ventures as a Principal to lead the partner development team and to focus on new company formation from September 2013 to August 2016. While at Third Rock Ventures, she was part of the founding management team for Decibel Therapeutics Inc. and Interim Head of Business Development for Edimer Pharmaceuticals Inc. Prior to joining Third Rock Ventures, Christina was a senior member of the corporate development team at Ironwood Pharmaceuticals, Inc., or Ironwood, from July 2007 to September 2013, where she led the business and commercial roles on several development teams, and contributed to the growth of the pipeline through the establishment and management of the company's in-licensing efforts. Prior to Ironwood, she formed several early-stage companies while part of the Technology Development Fund at Boston University and during her time at Accelerator Corporation in Seattle. Dr. Isacson holds an undergraduate degree in biology from McGill University and a doctorate in neuroscience from Tufts University School of Medicine.

Zoran Zdraveski, J.D., Ph.D. has served as our Chief Legal Officer since April 2017. Dr. Zdraveski is responsible for all aspects of Magenta's legal, intellectual property, and compliance functions. Dr. Zdraveski has more than 16 years of experience in the legal field in the biopharmaceutical industry. Most recently he served as Vice President and Associate General Counsel at Epizyme Inc., or Epizyme, from July 2012 to April 2017, where he established the legal team and managed all aspects of legal, intellectual property and compliance both before and after the company's 2013 initial public offering. Prior to joining Epizyme, he held patent counsel positions at Ironwood from April 2011 to July 2012 and Genzyme Therapeutics, or Genzyme, from September 2009 to April 2011. Dr. Zdraveski earned a doctorate in biochemistry from the Massachusetts Institute of Technology, holds a J.D. from Suffolk University Law School, a graduate degree in chemistry and undergraduates degrees in chemistry and studio art, all from Southern Methodist University.

Cindy Driscoll has served as our Vice President, Finance since June 2017. Ms. Driscoll has more than 25 years of financial leadership experience. Prior to joining Magenta in June 2017, Ms. Driscoll worked at Tokai Pharmaceuticals, Inc., or Tokai, from June 2011 to June 2017, most recently as the vice president of finance from September 2014 to June 2017, where she oversaw all finance and administrative operations for the publicly-traded company, including supporting its 2014 initial public offering. Prior to Tokai, Ms. Driscoll also worked as

a financial consultant from July 2005 to June 2011, during which time she served as controller for Gloucester Pharmaceuticals, Inc. (now owned by Celgene Corporation) and Transmolecular, Inc. (now owned by Morphotek, Inc.) and supported due diligence efforts related to acquisitions of both companies. Ms. Driscoll earned her undergraduate degree in economics from the State University of New York at Oswego and completed her Master of Business Administration at Suffolk University.

Non-Employee Directors

Jeffrey Albers has served as a member of our board of directors since July 2017. Mr. Albers has over fifteen years of experience in leadership roles in the biopharmaceutical industry and is currently the president and chief executive officer of Blueprint Medicines Corporation, or Blueprint. Prior to joining Blueprint in July 2014, Mr. Albers was president of Algeta ASA, or Algeta, a Norwegian biopharmaceutical company from January 2012 to April 2014, where he oversaw the commercial and business functions. Prior to Algeta, from July 2005 to November 2011, Mr. Albers was at Genzyme, a biotechnology company that is now a wholly-owned subsidiary of Sanofi S.A., most recently as vice president of the U.S. hematology and oncology business unit. Mr. Albers serves on the board of directors of Blueprint and the New England American Cancer Society. Mr. Albers received a B.S. from Indiana University and an M.B.A. and a J.D. from Georgetown University. We believe that Mr. Albers' leadership in the life sciences industry qualifies him to serve on our board of directors.

Michael W. Bonney has served as a member of our board of directors since October 2016 and as the chairman of our board from October 2016 to March 2018. Mr. Bonney is the Chief Executive Officer and Chair of Kaleido Biosciences, Inc. since June 2017. Mr. Bonney was a Partner at Third Rock Ventures, a healthcare venture firm, from January to July 2016. Mr. Bonney previously served as the Chief Executive Officer and a member of the board of directors of Cubist Pharmaceuticals, Inc., or Cubist, a biopharmaceutical company (now a wholly-owned subsidiary of Merck & Co., Inc.), from June 2003 until his retirement in December 2014. From January 2002 to June 2003, he served as Cubist's President and Chief Operating Officer. Mr. Bonney is a trustee of the tekla complex of health care dedicated, publicly traded funds. In addition, Mr. Bonney currently serves as a director of Celgene Corporation, Alnylam Pharmaceuticals Inc. and Sarepta Corporation. Mr. Bonney formerly served on the board of directors of Global Blood Therapeutics, Inc., NPS Pharmaceuticals, Inc. and Cubist. Mr. Bonney received a B.A. in Economics from Bates College. Mr. Bonney possesses over 30 years of operational, commercial and senior management experience in the biopharmaceutical industry, including his long tenure as the Chief Executive Officer and a director of Cubist. We believe Mr. Bonney's breadth of experience over the past 35 years and deep commercial background qualifies him to serve on our board of directors.

Bruce Booth, D.Phil. has served as a member of our board of directors since February 2016. Dr. Booth joined Atlas Venture in 2005, and currently serves as partner. Previously, from 2004 to 2005, Dr. Booth was a principal at Caxton Health Holdings L.L.C., a healthcare-focused investment firm, where he focused on the firm's venture capital activities. Prior to Caxton, from 1999 to 2004, he was an associate principal at McKinsey & Company, a global strategic management consulting firm, where he advised clients on R&D productivity, corporate strategy and business development issues across the biopharmaceutical sector. Dr. Booth serves on the board of several privately held companies, as well as on the board of miRagen Therapeutics, Inc. and Zafgen, Inc. Dr. Booth also serves on UCB Pharma's New Medicines Scientific Advisory Board, and participates on several other advisory boards for pharmaceutical companies and academic medical centers. As a British Marshall Scholar, Dr. Booth holds a D.Phil in molecular immunology from Oxford University's Nuffield Department of Medicine and a B.S. in biochemistry, summa cum laude, from Pennsylvania State University. We believe Dr. Booth's extensive leadership, executive, managerial and business experience with life sciences companies, including experience in the formation, development and business strategy of multiple start-up companies in the life sciences sector qualifies him to serve on our board of directors.

Alexis A. Borisy has served as a member of our board of directors since our founding in June 2015. Since 2010, Mr. Borisy has been a partner at Third Rock Ventures, or Third Rock, a life sciences venture capital firm focused on the formation, development and strategy of new companies. Mr. Borisy co-founded Blueprint and served as the interim chief executive officer from May 2013 through July 2014 and has served as a member of its board of

directors since April 2011. Since November 2013, Mr. Borisy has served as a member of the board of directors of Editas Medicine, Inc. Since 2011, Mr. Borisy has served as executive chairman of Warp Drive Bio, LLC, a life sciences company focusing on genomics where he served as chief executive officer from 2011 to July 2013. In addition, Mr. Borisy currently serves on the board of directors of the following privately held biopharmaceutical companies: Revolution Medicines, Inc., Relay Therapeutics, Inc., Tango Therapeutics, Inc. and Celsius Therapeutics. From 2007 to 2012, Mr. Borisy served as chairman of FORMA Therapeutics, Inc., a biopharmaceutical company focused on discovering and developing medicines in cancer and other genetically-driven diseases. Mr. Borisy co-founded Foundation Medicine, Inc., or Foundation Medicine, where he served as its interim chief executive officer from 2009 to 2011 and has served as a member of its board of directors since 2009, including as chairman of Foundation Medicine's board of directors from 2011 to February 2017. Mr. Borisy received an A.B. in chemistry from the University of Chicago and an A.M. from Harvard University. We believe Mr. Borisy's detailed knowledge of our company and long tenure with us, along with his experience working with and serving on the boards of directors of life sciences companies, and his experience working in the venture capital industry qualifies him to serve on our board of directors.

Blake Byers, Ph.D. has served as a member of our board of directors since April 2017. Since 2010, Dr. Byers has worked at GV (formerly Google Ventures). As an investor and partner at GV, Dr. Byers partners with founders of life science and digital companies. Dr. Byers serves as Interim President and as a member of the board of directors of Pact Pharma, Inc. Dr. Byers also serves on the board of directors of several private companies, including IonQ Inc. and LendUp. Prior to joining GV, Dr. Byers helped start two companies, led research projects on biomedical engineering and stem cells at Stanford University and was an angel investor. Dr. Byers received a Ph.D. and M.S. in bioengineering from Stanford University and holds a B.S in biomedical engineering and economics from Duke University. We believe Dr. Byers' experience working in the venture capital industry and history with stem cell technology qualifies him to serve on our board of directors.

Thomas O. Daniel, M.D. has served as a member of our board of directors since October 2016. Dr. Daniel has 18 years of experience in biopharmaceutical discovery and development. He is currently Chairman of Vividion Therapeutics, Inc., is a venture partner at ARCH Venture Partners, Inc., Zafgen, Inc., VIR Biotechnology, Inc., ImmusanT, Inc, and Gossamer Bio, Inc. He was recently Chairman of Research at Celgene Corporation, and served as President of Research and Early Development from December 2006 until February 2012, and as Executive Vice President and President of Research and Early Development until December 2015. Previously, he served as Chief Scientific Officer and Director at Ambrx Inc., from August 2003 to November 2006. Dr. Daniel also served as Vice President of Research at Amgen Inc. from August 2002 to April 2003, where he was Research Site Head of Amgen Washington and Therapeutic Area Head of Inflammation. Prior to Amgen's acquisition of Immunex Corporation, Dr. Daniel served as Senior Vice President of Discovery Research at Immunex Corporation from May 2000 to August 2002. Dr. Daniel is a Trustee of Reed College, serves on the Board of the Alliance for Lupus Research, and advises BlackThorn Therapeutics, Inc. a privately-held biotechnology company. Dr. Daniel serves as a member of the Biomedical Science Advisory Board of Vanderbilt University Medical Center. A nephrologist and former academic investigator, Dr. Daniel was previously the C.M. Hakim Professor of Medicine and Cell Biology at Vanderbilt University, and Director of the Vanderbilt Center for Vascular Biology. He formerly conducted research in the Howard Hughes Medical Institute at UC San Francisco, earned an M.D. from the University of Texas, Southwestern, and completed medical residency at Massachusetts General Hospital. Dr. Daniel's qualifications to serve on our board of directors include his biotechnology and pharmaceutical experience, including senior leadership roles at global biopharmaceutical companies Celgene Corporation and Amgen.

Amy L. Ronneberg has served on our board of directors since March 2018. Ms. Ronneberg joined Be The Match, a healthcare organization, as the Chief Financial Officer in 2013, and also serves as the President at Be The Match BioTherapies, a start-up company. Ms. Ronneberg formulated a new organizational operating model, established international operations, transformed several struggling areas within the organization and directed the completion of a seven story headquarter. Ms. Ronneberg has 20 years of experience in financial and operational leadership, serving as Executive Vice President, CFO and Chief Operating Officer of North American Membership Group, a

private equity-owned media company. Prior to that, Ms. Ronneberg spent 12 years at Capella University, where she served in roles such as Vice President of Finance and Vice President of Operations lead enterprise-wide operations and customer service. Ms. Ronneberg also worked for Ernst & Young for several years as an Audit Manager. Ms. Ronneberg is a member of the executive committee for the World Marrow Donor Association and previously served as chairman of the board of Twin Cities in Motion, Minneapolis. Ms. Ronneberg earned a Master's in Business Administration from Capella University, Minneapolis, Minnesota and a B.B.A. in Accounting from University of Wisconsin-Eau Claire. We believe Ms. Ronneberg's financial expertise and knowledge of the transplant industry qualifies her to serve on our board of directors.

David T. Scadden, M.D., one of our co-founders, has served on our board of directors and as Chairman of our Scientific Advisory Board since November 2016. Dr. Scadden is the Gerald and Darlene Jordan Professor of Medicine at Harvard University since 2016. He and Professor Douglas Melton founded and jointly direct the Harvard Stem Cell Institute, which is the largest institute dedicated to bringing stem cell biology to medical care in the world. With Professor Melton, Dr. Scadden founded and he chairs the Department of Stem Cell and Regenerative Biology Department at Harvard University, the first department to span faculties in Harvard's history. He is a hematologist/oncologist and directs the Center for Regenerative Medicine at the Massachusetts General Hospital and previously chaired the Hematologic Malignancies program in the MGH Cancer Center. Dr. Scadden is an expert on the medical applications of stem cell biology with a particular emphasis on their use in the settings of cancer and AIDS. He has published over 300 scientific papers and book chapters, and his laboratory has made fundamental contributions in how the stem cell niche regulates stem cell function and in normal and disease-corrupted hematopoiesis. Dr. Scadden serves as a director on the board of Agios Pharmaceuticals, Inc. In addition, Dr. Scadden is a member of the board of several private companies, including Clear Creek Bio, Inc., Red Oak Medicines Inc. and LifeVault Bio, Inc., and also serves on several scientific advisory boards, including Magenta's. In addition, he has served or serves on the Board of Scientific Counselors for the National Cancer Institute, the Board of External Experts for the National Heart, Lung and Blood Institute, Board of Directors of the International Society for Stem Cell Research (ISSCR) and is an Associate Member of the Broad Institute of Harvard and MIT. He is an elected member of the National Academy of Medicine and the American Academy of Arts and Sciences and is a fellow of the American Association for the Advancement of Science and the American College of Physicians. He is the recipient of numerous awards from scholarly societies and honorary degrees from multiple universities. We believe Dr. Scadden's experience as a physician and medical researcher qualifies him to serve on our board of directors.

Composition of our Board of Directors

Our board of directors consists of nine members, each of whom are members pursuant to the board composition provisions of our certificate of incorporation and our stockholders agreement, which agreement is described under "Certain Relationships and Related Party Transactions" in this prospectus. These board composition provisions will terminate upon the completion of this offering. Upon the termination of these provisions, there will be no further contractual obligations regarding the election of our directors. Effective upon the completion of this offering, we intend to form a nominating and corporate governance committee. Our nominating and corporate governance committee and our board of directors may consider a broad range of factors relating to the qualifications and background of director nominees, which may include diversity, which is not only limited to race, gender or national origin, although we currently have no formal policy regarding board diversity. Our nominating and corporate governance committee's and our board of directors' priority in selecting board members is identification of persons who will further the interests of our stockholders through his or her established record of professional accomplishment, the ability to contribute positively to the collaborative culture among board members, knowledge of our business, understanding of the competitive landscape and professional and personal experiences and expertise relevant to our growth strategy. Our directors hold office until their successors have been elected and qualified or until the earlier of their resignation or removal. Our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering also provide that our directors may be removed only for cause by the affirmative vote of the holders of at least % of the votes that all our stockholders would be entitled to cast in an annual election

of directors, and that any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office.

Director Independence. Our board of directors has determined that all of the members of the board of directors, except for Dr. Gardner, are independent directors, including for purposes of the rules of NASDAQ Stock Market and relevant federal securities laws and regulations. There are no family relationships among any of our directors or executive officers.

Staggered Board. In accordance with the terms of our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering, our board of directors will be divided into three classes, Class I, Class II and Class III, with each class serving staggered three-year terms. Upon the expiration of the term of a class of directors, directors in that class will be eligible to be elected for a new three-year term at the annual meeting of stockholders in the year in which their term expires.

- Our Class I directors will be , and ;
- Our Class II directors will be , , and ; and
- Our Class III directors will be , , and .

Our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering provide that the number of directors may be changed only by resolution of our board of directors.

The division of our board of directors into three classes with staggered three-year terms may delay or prevent stockholder efforts to effect a change of our management or a change in control.

Committees of our Board of Directors

Our board of directors plans on establishing an audit committee, a compensation committee and a nominating and corporate governance committee, each of which will operate pursuant to a charter to be adopted by our board of directors and will be effective upon completion of the offering. Following the completion of this offering, copies of each committee's charter will be posted on the corporate governance section of our website, at *www.magentatx.com*. The inclusion of our website address in this prospectus does not incorporate by reference the information on or accessible through our website into this prospectus.

Audit Committee. Effective upon completion of this offering, , and will serve on the audit committee, which will be chaired by . Our board of directors has determined that , and are "independent" for audit committee purposes as that term is defined in the rules of the SEC and the applicable NASDAQ Stock Market rules, and has sufficient knowledge in financial and auditing matters to serve on the audit committee. Our board of directors has designated as an "audit committee financial expert," as defined under the applicable rules of the SEC. Our board has determined that while satisfy the independence requirements under applicable NASDAQ Stock Market rules, they do not satisfy the independence requirements of the SEC applicable to members of audit committees. The transition rules of the SEC provide that two members of the audit committee may be exempt from these more stringent independence requirements for 90 days after the effectiveness of this registration statement, and one member may be exempt for one year after the effectiveness of this registration statement. Our board of directors intends to cause our audit committee to comply with the transition rules within the applicable time periods. The audit committee's responsibilities include:

- appointing, approving the compensation of, and assessing the independence of our independent registered public accounting firm;
- pre-approving auditing and permissible non-audit services, and the terms of such services, to be provided by our independent registered public accounting firm;
- reviewing the overall audit plan with our independent registered public accounting firm and members of management responsible for preparing our financial statements;

- reviewing and discussing with management and our independent registered public accounting firm our annual and quarterly financial statements and related disclosures as well as critical accounting policies and practices used by us;
- coordinating the oversight and reviewing the adequacy of our internal control over financial reporting;
- establishing policies and procedures for the receipt and retention of accounting-related complaints and concerns;
- recommending based upon the audit committee's review and discussions with management and our independent registered public accounting firm whether our audited financial statements shall be included in our Annual Report on Form 10-K;
- monitoring the integrity of our financial statements and our compliance with legal and regulatory requirements as they relate to our financial statements and accounting matters;
- preparing the audit committee report required by SEC rules to be included in our annual proxy statement;
- reviewing all related person transactions for potential conflict of interest situations and approving all such transactions; and
- reviewing quarterly earnings releases and scripts.

Compensation Committee. Effective upon completion of this offering, , and will serve on the compensation committee, which will be chaired by . Our board of directors has determined that each member of the compensation committee is "independent" as defined in the applicable NASDAQ Stock Market rules. Our board has determined that while satisfy the independence requirements under applicable NASDAQ Stock Market rules, they do not satisfy the independence requirements of the SEC applicable to members of compensation committees. The transition rules of the SEC provide that two members of the compensation committee may be exempt from these more stringent independence requirements for 90 days after the effectiveness of this registration statement, and one member may be exempt for one year after the effectiveness of this registration statement. Our board of directors intends to cause our compensation committee to comply with the transition rules within the applicable time periods. The compensation committee's responsibilities include:

- annually reviewing and approving corporate goals and objectives relevant to the compensation of our Chief Executive Officer;
- evaluating the performance of our Chief Executive Officer in light of such corporate goals and objectives and determining the compensation of our Chief Executive Officer;
- reviewing and approving the compensation of our other executive officers;
- reviewing and establishing our overall management compensation, philosophy and policy;
- overseeing and administering our compensation and similar plans;
- evaluating and assessing potential and current compensation advisors in accordance with the independence standards identified in the applicable NASDAQ Stock Market rules;
- retaining and approving the compensation of any compensation advisors;
- reviewing and approving our policies and procedures for the grant of equity-based awards;
- reviewing and making recommendations to the board of directors with respect to director compensation;
- reviewing and discussing with management the compensation discussion and analysis to be included in our annual proxy statement or Annual Report on Form 10-K; and

- reviewing and discussing with the board of directors the corporate succession plans for the Chief Executive Officer and other key officers.

Nominating and Corporate Governance Committee. Effective upon completion of this offering, , and will serve on the nominating and corporate governance committee, which will be chaired by . Our board of directors has determined that each member of the nominating and corporate governance committee is "independent" as defined in the applicable NASDAQ Stock Market rules. The nominating and corporate governance committee's responsibilities include:

- developing and recommending to the board of directors criteria for board and committee membership;
- establishing procedures for identifying and evaluating board of director candidates, including nominees recommended by stockholders;
- reviewing the size and composition of the board of directors to ensure that it is composed of members containing the appropriate skills and expertise to advise us;
- identifying individuals qualified to become members of the board of directors;
- recommending to the board of directors the persons to be nominated for election as directors and to each of the board's committees;
- developing and recommending to the board of directors a code of business conduct and ethics and a set of corporate governance guidelines;
- developing a mechanism by which violations of the code of business conduct and ethics can be reported in a confidential manner; and
- overseeing the evaluation of the board of directors and management.

Our board of directors may from time to time establish other committees.

Compensation Committee Interlocks and Insider Participation

None of the members of our compensation committee has at any time during the prior three years been one of our officers or employees. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving on our board of directors or compensation committee.

Corporate Governance

We plan to adopt a code of business conduct and ethics that applies to all of our employees, officers and directors, including those officers responsible for financial reporting, which will be effective upon completion of this offering. Upon the completion of this offering, our code of business conduct and ethics will be available on our website at *www.magentatx.com*. The inclusion of our website address in this prospectus does not incorporate by reference the information on or accessible through our website into this prospectus. We intend to disclose any substantive amendments to the code, or any waivers of its requirements, on our website or in a Current Report on Form 8-K.

Board Leadership Structure and Board's Role in Risk Oversight

Michael Bonney currently serves as the chairman of the board. We believe that the role of a lead independent director allows our Chief Executive Officer to focus on our day-to-day business, while allowing the lead independent director to lead the board of directors in its fundamental role of providing advice to and independent oversight of management. Our board of directors recognizes the time, effort and energy that the Chief Executive Officer is required to devote to his position in the current business environment, as well as the commitment required to serve as our lead independent director,

particularly as the board of directors' oversight responsibilities continue to grow. While our amended and restated bylaws and corporate governance guidelines do not require that we appoint a separate chairman and Chief Executive Officer, our board of directors believes that having separate positions is the appropriate leadership structure for us at this time and demonstrates our commitment to good corporate governance.

Risk is inherent with every business, and how well a business manages risk can ultimately determine its success. We face a number of risks, including risks relating to our operations, strategic direction and intellectual property as more fully discussed under "Risk Factors" in this prospectus. Management is responsible for the day-to-day management of risks we face, while our board of directors, as a whole and through its committees, has responsibility for the oversight of risk management. In its risk oversight role, our board of directors has the responsibility to satisfy itself that the risk management processes designed and implemented by management are adequate and functioning as designed.

The role of the board of directors in overseeing the management of our risks is conducted primarily through committees of the board of directors, as disclosed in the descriptions of each of the committees above and in the charters of each of the committees. The full board of directors (or the appropriate board committee in the case of risks that are under the purview of a particular committee) discusses with management our major risk exposures, their potential impact on us, and the steps we take to manage them. When a board committee is responsible for evaluating and overseeing the management of a particular risk or risks, the chairman of the relevant committee reports on the discussion to the full board of directors during the committee reports portion of the next board meeting. This enables the board of directors and its committees to coordinate the risk oversight role, particularly with respect to risk interrelationships.

EXECUTIVE COMPENSATION

Executive Compensation Overview

Our executive compensation program has reflected our growth and development-oriented corporate culture. To date, the compensation of the individuals listed below, whom we refer to as our named executive officers, has primarily consisted of a combination of base salary, bonuses and long-term incentive compensation. Our named executive officers, like all full-time employees, are eligible to participate in our health and welfare benefit plans. As we transition from a private company to a publicly traded company, we will evaluate our compensation values and philosophy and compensation plans and arrangements as circumstances require. At a minimum, we expect to review executive compensation annually with input from a compensation consultant. As part of this review process, we expect the board of directors and the compensation committee to apply our values and philosophy, while considering the compensation levels needed to ensure our executive compensation program remains competitive. We will also review whether we are meeting our retention objectives and the potential cost of replacing a key employee.

Summary Compensation Table

The following table presents information regarding the total compensation awarded to, earned by, and paid to our President and Chief Executive Officer and our next two highest paid executive officers during the year ended December 31, 2017. We refer to these individuals as our named executive officers.

Name and Principal Position	Year	Salary ($)	Non-Equity Incentive Plan Compensation ($)(1)	All Other Compensation ($)(2)	Total ($)
Jason Gardner, D.Phil. *President and Chief Executive Officer*	2017	405,000	194,400	4,233	603,633
Michael P. Cooke, Ph.D. *Chief Scientific Officer*	2017	362,500	127,240	6,226	495,966
Bastiano Sanna, Ph.D.(3) *Former Chief Operating Officer*	2017	310,500	109,920	3,946	424,366

(1) Represents the bonuses paid to our named executive officers based upon company and individual performance objectives in 2017.
(2) Represents the value of company-paid premiums for group term life insurance, and employer contributions to a Health Savings Account.
(3) Dr. Sanna tendered his resignation on March 23, 2018, to be effective on March 30, 2018.

Narrative to Summary Compensation Table

Employment Arrangements with Our Named Executive Officers

We have entered into an offer letter with each of our named executive officers in connection with their employment with us. Except as noted below, these offer letters provide for “at will” employment.

Jason Gardner, D.Phil.

For the year ended December 31, 2017, the annual base salary for Dr. Gardner was $405,000. For 2017, Dr. Gardner was eligible to earn an annual cash incentive bonus targeted at 40% of his base salary. Dr. Gardner is also eligible to participate in the employee benefit plans available to our employees, subject to the terms of those plans.

Pursuant to Dr. Gardner’s offer letter dated June 8, 2016, Dr. Gardner was eligible to receive a one-time sign-on bonus of $25,000 at the closing of the Company’s series A financing, which was paid in 2016.

Pursuant to Dr. Gardner's offer letter, in the event that he is terminated by us without "cause", subject to his execution of a separation agreement and general release, he will be entitled to (i) continuation of his base salary for a period of 12 months following his termination of employment, (ii) payment of 12 months of health insurance premiums provided under COBRA for Dr. Gardner and his eligible dependents following his termination of employment at the same rate as we pay for active employees, and (iii) the prorated portion of his target bonus for the fiscal year in which he is terminated, based on the number of days employed during such fiscal year. If Dr. Gardner is employed or consulting more than 50% of his time during the 12 month severance period, the severance payments will discontinue.

Pursuant to Dr. Gardner's offer letter, in the event that Dr. Gardner's employment with the Company is terminated within the 12 month period following or the 30 day period immediately prior to a "change in control" on account of death or "permanent disability", by us without "cause", or as a result of his resignation for "good reason", 100% of his then unvested equity (or outstanding unvested restricted stock and/or options to purchase shares of our common stock) will accelerate and become fully vested.

Michael P. Cooke, Ph.D.

For the year ended December 31, 2017, the annual base salary for Dr. Cooke was $362,500. For 2017, Dr. Cooke was eligible to earn an annual cash incentive bonus targeted at 30% of his base salary. Dr. Cooke is also eligible to participate in the employee benefit plans available to our employees, subject to the terms of those plans.

Pursuant to Dr. Cooke's offer letter dated May 30, 2016, Dr. Cooke was eligible to receive a relocation bonus of $150,000, which was paid in 2016. If Dr. Cooke voluntarily leaves the Company, other than for death or disability, within 12 months of receiving the bonus payment, he will be obligated to return the gross amount of the payments to the Company within 30 days of his departure date. Additionally, Dr. Cooke was eligible to receive reimbursements from us for temporary housing for the three months of his employment with the Company.

Pursuant to Dr. Cooke's offer letter, in the event that he is terminated by us without "cause", subject to his execution of a separation agreement and general release, he will be entitled to (i) 6 months of base salary payable in equal installments over 12 months and (ii) payment of 12 months of health insurance premiums provided under COBRA for Dr. Cooke and his eligible dependents following his termination at the same rate as we pay for active employees.

Bastiano Sanna, Ph.D.

For the year ended December 31, 2017, the annual base salary for Dr. Sanna was $310,500. For 2017, Dr. Sanna was eligible to earn an annual cash incentive bonus targeted at 30% of his base salary. Dr. Sanna is also eligible to participate in the employee benefit plans available to our employees, subject to the terms of those plans.

Pursuant to Dr. Sanna's offer letter dated April 29, 2016, Dr. Sanna was eligible to receive a one-time sign-on bonus of $50,000 and a relocation bonus of $30,000, both of which were paid in 2016. If Dr. Sanna had voluntarily left the Company, other than for death or disability, within 12 months of receiving either bonus payment, he would have been obligated to return the gross amount of the payments to the Company within 30 days of his departure date.

Employee Confidentiality and Assignment Agreements

Each of our named executive officers has entered into a standard form agreement with respect to confidential information and assignment of inventions. Among other things, this agreement obligates each named executive officer to refrain from disclosing any of our proprietary information received during the course of employment and to assign to us any inventions conceived or developed during the course of employment.

Outstanding Equity Awards at Fiscal Year End

The following table presents the outstanding equity awards held by each of our named executive officers as of December 31, 2017:

	Stock Awards	
Name	Number of Shares that Have Not Vested (#)	Market Value of Shares that Have Not Vested ($)(1)
Jason Gardner, D.Phil.(2) *President and Chief Executive Officer*	1,250,000	3,725,000
Michael P. Cooke, Ph.D.(3) *Chief Scientific Officer*	466,172	1,389,193
Bastiano Sanna, Ph.D.(4) *Former Chief Operating Officer*	388,477	1,157,661

(1) There was no public market for our common stock as of December 31, 2017. The fair market value of our common stock as of December 31, 2017 was $2.98 per share.

(2) Dr. Gardner purchased 2,500,000 shares of restricted stock on November 1, 2016 for $0.001 per share. 25% of the shares of restricted stock were vested on November 1, 2016, the grant date, and thereafter the remaining shares of restricted stock vest thereafter in 12 equal quarterly installments, subject to his continuous service. All unvested shares of restricted stock shall vest in the event that Dr. Gardner's employment is terminated without cause or on account of death or permanent disability, or Dr. Gardner resigns for good reason (each as defined in Dr. Gardner's offer letter) within the 30 days prior to or 12 months following a sale of the Company.

(3) Dr. Cooke purchased 745,875 shares of restricted stock on November 1, 2016 for $0.001 per share. 25% of the shares of restricted stock vested on May 31, 2017, the first anniversary of the vesting commencement date, and the remaining shares vest thereafter in 12 equal quarterly installments, subject to his continuous service.

(4) Dr. Sanna purchased 621,563 shares of restricted stock on November 1, 2016 for $0.001 per share. 25% of the shares of restricted stock vested on April 29, 2017, the first anniversary of the vesting commencement date, and the remaining shares vest thereafter in 12 equal quarterly installments, subject to his continuous service.

Director Compensation

The following table provides certain information concerning compensation earned by the directors who were not named executive officers during the year ended December 31, 2017.

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)(1)	Option Awards ($)(1)	All Other Compensation ($)	Total ($)
Michael W. Bonney(2)	—	—	—	—	—
Alexis A. Borisy	—	—	—	—	—
Thomas O. Daniel, M.D.(3)	35,000	—	—	—	35,000
Bruce Booth, D.Phil.	—	—	—	—	—
David T. Scadden, M.D.(4)	—	—	—	100,000	100,000
Alison Lawton(5)	22,271	—	170,982	—	193,253
Jeffrey Albers(6)	15,558	—	171,781	—	187,339
Blake Byers, Ph.D.	—	—	—	—	—

(1) In accordance with SEC rules, these columns reflect the aggregate grant date fair value of the option awards granted during 2017 computed in accordance with Financial Accounting Standard Board ASC Topic 718 for

stock-based compensation transactions, or ASC 718. Assumptions used in the calculation of these amounts are included in Note 7 to our financial statements included elsewhere in this prospectus.

(2) As of December 31, 2017, Mr. Bonney held 312,500 shares of unvested restricted stock.

(3) Pursuant to a letter agreement with us, Dr. Daniel is paid a cash retainer of $35,000 as a non-employee director. Pursuant to his letter agreement, he also received an initial grant of a right to purchase shares of restricted common stock representing approximately 0.4% of the Company (assuming a Series A capital raise of $33 million), vesting in equal quarterly installments over four years from the date he joined the board, subject to his continuous service. Each year thereafter, he is also eligible to receive upon the anniversary of the initial grant or as otherwise determined by the board, an option to purchase 25,000 shares, vesting in equal quarterly installments over one year from the grant date. As of December 31, 2017, Dr. Daniel held 150,000 shares of unvested restricted stock.

(4) Dr. Scadden was paid $100,000 in 2017 related to services for the Scientific Advisory Board and did not receive compensation for his role on the Board of Directors. As of December 31, 2017, Dr. Scadden held 958,334 shares of unvested restricted stock.

(5) Ms. Lawton resigned from our board in February 2018. Pursuant to a letter agreement with us, Ms. Lawton was paid a cash retainer of $35,000 as a non-employee director, which was prorated in 2017 based on her start date in May 2017. Pursuant to her letter agreement, she also received an initial grant of a stock option to purchase 135,000 shares of common stock, vesting in equal quarterly installments over four years from the date she joined the board, subject to her continuous service. Each year thereafter, she is also eligible to receive upon the anniversary of the initial grant or as otherwise determined by the board, an option to purchase 25,000 shares, vesting in equal quarterly installments over one year from the grant date. As of December 31, 2017, Ms. Lawton held an unexercised option to purchase 135,000 shares of our common stock.

(6) Pursuant to a letter agreement with us, Mr. Albers is paid an annual cash retainer of $35,000 as a non-employee director, which was prorated in 2017 based on his start date in July 2017. Pursuant to his letter agreement, he also received an initial grant of a stock option to purchase 135,000 shares of common stock, vesting in equal quarterly installments over four years from the date he joined the board, subject to his continuous service. Each year thereafter, he is also eligible to receive upon the anniversary of the initial grant or as otherwise determined by the board, an option to purchase 25,000 shares, vesting in equal quarterly installments over one year from the grant date. As of December 31, 2017, Mr. Albers held an unexercised option to purchase 135,000 shares of our common stock.

We intend to adopt a non-employee director compensation policy upon the completion of this offering.

Compensation Risk Assessment

We believe that although a portion of the compensation provided to our executive officers and other employees is performance-based, our executive compensation program does not encourage excessive or unnecessary risk taking. This is primarily due to the fact that our compensation programs are designed to encourage our executive officers and other employees to remain focused on both short-term and long-term strategic goals, in particular in connection with our pay-for-performance compensation philosophy. As a result, we do not believe that our compensation programs are reasonably likely to have a material adverse effect on our company.

Compensation Plans

2016 Stock Option and Grant Plan

The 2016 Stock Option and Grant Plan, or the 2016 Plan, was approved by our board of directors and our stockholders on November 1, 2016 and amended in April 2017. Under the 2016 Plan, 10,377,440 shares of common stock have been reserved for issuance in the form of incentive stock options, non-qualified stock options, restricted stock, unrestricted stock or any combination of the foregoing. The shares issuable pursuant to awards granted under the 2016 Plan are authorized but unissued shares.

The 2016 Plan is administered by our board or at the discretion of the board, which has full power to select the individuals to whom awards will be granted and to determine the specific terms and conditions of each award,

subject to the provisions of the 2016 Plan. Pursuant to the 2016 Plan and subject to applicable law, our board of directors has delegated to the compensation committee the power to make recommendations to the board of directors relating to management compensation, the adoption of employee benefit plans, stock option or equity incentive plans and other similar matters.

The option exercise price of each option granted under the 2016 Plan is determined by our board of directors and may not be less than the fair market value of a share of common stock on the date of grant. The term of each option is fixed by the board and may not exceed 10 years from the date of grant. The board determines at what time or times each option may be exercised when granting the option.

The 2016 Plan provides that, upon the consummation of a sale event, unless provision is made in connection with the sale event for the assumption or continuation of the awards by the successor entity or substitution of the awards with new awards of the successor entity, with appropriate adjustment, the 2016 Plan and all outstanding and unexercised options issued thereunder will terminate upon the effective time of the sale event. We may make or provide for cash payment to holders of options equal to the difference between (i) the per share cash consideration in the sale event multiplied by the number of shares subject to outstanding options being cancelled, and (ii) the aggregate exercise price to the holders of all vested and exercisable options.

Our board of directors may amend the 2016 Plan but no such action may adversely affect the rights of an award holder without such holder's consent. Approval by our stockholders of amendments to the 2016 Plan must be obtained if required by law.

As of December 31, 2017, options to purchase 1,613,500 shares of common stock were outstanding under the 2016 Plan. Our board has determined not to make any further awards under the 2016 Plan following the completion of this offering.

2018 Stock Option and Incentive Plan

Prior to the effectiveness of this offering, our board of directors intends to adopt, and we expect our stockholders will approve, our 2018 Stock Option and Incentive Plan, or the 2018 Plan. Our 2018 Plan will be effective on the business day immediately prior to the effective date of the registration statement of which this prospectus forms a part and is not expected to be utilized until after the completion of this offering. Our 2018 Plan will provide for the grant of incentive stock options, within the meaning of Section 422 of the Code, to our employees and any of our parent and subsidiary corporations' employees, and for the grant of nonstatutory stock options, restricted stock, restricted stock units, stock appreciation rights, performance units and performance shares to our employees, directors and consultants, and our parent and subsidiary corporations' employees and consultants.

We have initially reserved shares of our common stock, or the Initial Limit, for the issuance of awards under the 2018 Plan. The 2018 Plan provides that the number of shares reserved and available for issuance under the plan will automatically increase each January 1, beginning on January 1, 2019, by % of the outstanding number of shares of our common stock on the immediately preceding December 31 or such lesser number of shares as determined by our compensation committee, or the Annual Increase. This number is subject to adjustment in the event of a stock split, stock dividend or other change in our capitalization.

The shares we issue under the 2018 Plan will be authorized but unissued shares or shares that we reacquire. The shares of common stock underlying any awards that are forfeited, cancelled, held back upon exercise or settlement of an award to satisfy the exercise price or tax withholding, reacquired by us prior to vesting, satisfied without any issuance of stock, expire or are otherwise terminated (other than by exercise) under the 2018 Plan and 2018 Plan will be added back to the shares of common stock available for issuance under the 2018 Plan.

The maximum aggregate number of shares that may be issued in the form of incentive stock options shall not exceed the Initial Limit cumulatively increased on January 1, 2019 and on each January 1 thereafter by the lesser of the Annual Increase for such year or shares of common stock.

The 2018 Plan will be administered by our compensation committee. Our compensation committee has full power to select, from among the individuals eligible for awards, the individuals to whom awards will be granted, to make any combination of awards to participants, and to determine the specific terms and conditions of each award, subject to the provisions of the 2018 Plan. Persons eligible to participate in the 2018 Plan will be those full or part-time officers, employees, non-employee directors and other key persons (including consultants) as selected from time to time by our compensation committee in its discretion.

The 2018 Plan permits the granting of both options to purchase common stock intended to qualify as incentive stock options under Section 422 of the Code and options that do not so qualify. The option exercise price of each option will be determined by our compensation committee but may not be less than 100% of the fair market value of our common stock on the date of grant. The term of each option will be fixed by our compensation committee and may not exceed 10 years from the date of grant. Our compensation committee will determine at what time or times each option may be exercised.

Our compensation committee may award stock appreciation rights subject to such conditions and restrictions as we may determine. Stock appreciation rights entitle the recipient to shares of common stock, or cash, equal to the value of the appreciation in our stock price over the exercise price. The exercise price of each stock appreciation right may not be less than 100% of the fair market value of our common stock on the date of grant.

Our compensation committee may award shares of restricted common stock and restricted stock units to participants subject to such conditions and restrictions as it may determine. These conditions and restrictions may include the achievement of certain performance goals and continued employment with us through a specified vesting period. Our compensation committee may also grant shares of common stock that are free from any restrictions under the 2018 Plan. Unrestricted stock may be granted to participants in recognition of past services or other valid consideration and may be issued in lieu of cash compensation due to such participant.

Our compensation committee may grant cash bonuses under the 2018 Plan to participants, subject to the achievement of certain performance goals.

The 2018 Plan provides that in the case of, and subject to, the consummation of a “sale event” as defined in the 2018 Plan, all outstanding awards may be assumed, substituted or otherwise continued by the successor entity. To the extent that the successor entity does not assume, substitute or otherwise continue such awards, then upon the effectiveness of the sale event, all stock options and stock appreciation rights will automatically terminate. In the event of such termination, individuals holding options and stock appreciation rights will be permitted to exercise such options and stock appreciation rights prior to the sale event. In addition, in connection with a sale event, we may make or provide for a cash payment to participants holding options and stock appreciation rights equal to the difference between the per share cash consideration payable to stockholders in the sale event and the exercise price of the options or stock appreciation rights.

Our board of directors may amend or discontinue the 2018 Plan and our compensation committee may amend or cancel outstanding awards for purposes of satisfying changes in law or any other lawful purpose, but no such action may adversely affect rights under an award without the holder’s consent. Certain amendments to the 2018 Plan require the approval of our stockholders.

No awards may be granted under the 2018 Plan after the date that is ten years from the date of stockholder approval. No awards under the 2018 Plan have been made prior to the date of this prospectus.

Senior Executive Cash Incentive Bonus Plan

In , our board of directors adopted the Senior Executive Cash Incentive Bonus Plan, or the Bonus Plan. The Bonus Plan provides for cash bonus payments based upon the attainment of performance targets established by our compensation committee. The payment targets will be related to financial and operational measures or objectives with respect to our company, or Corporate Performance Goals, as well as individual performance objectives.

Our compensation committee may select Corporate Performance Goals from among the following: cash flow (including, but not limited to, operating cash flow and free cash flow); sales or revenue; corporate revenue; earnings before interest, taxes, depreciation and amortization; net income (loss) (either before or after interest, taxes, depreciation and/or amortization); changes in the market price of our common stock; economic value-added; development, clinical, regulatory or commercial milestones; acquisitions or strategic transactions, partnerships or joint ventures; operating income (loss); return on capital, assets, equity, or investment; stockholder returns; return on sales; gross or net profit levels; productivity; expense efficiency; margins; operating efficiency; customer satisfaction; working capital; earnings (loss) per share of our common stock; sales or market shares; number of customers; operating income and/or other strategic, financial or operational objectives, any of which may be measured in absolute terms, as compared to any incremental increase, in terms of growth, as compared to results of a peer group, against the market as a whole, compared to applicable market indices and/or measured on a pre-tax or post-tax basis.

Each executive officer who is selected to participate in the Bonus Plan will have a target bonus opportunity set for each performance period. The bonus formulas will be adopted in each performance period by the compensation committee and communicated to each executive. The Corporate Performance Goals will be measured at the end of each performance period after our financial reports have been published or such other appropriate time as the compensation committee determines. If the Corporate Performance Goals and individual performance objectives are met, payments will be made as soon as practicable following the end of each performance period. The Bonus Plan also permits the compensation committee to approve additional bonuses to executive officers in its sole discretion.

401(k) Plan and Other Benefits

We maintain a tax-qualified retirement plan, or the 401(k) Plan, that provides eligible U.S. employees with an opportunity to save for retirement on a tax advantaged basis. Eligible employees are able to defer eligible compensation subject to applicable annual Code limits. Employees' pre-tax or Roth contributions are allocated to each participant's individual account and are then invested in selected investment alternatives according to the participants' directions. Employees are immediately and fully vested in their contributions. Our 401(k) Plan is intended to be qualified under Section 401(a) of the Code with our 401(k) Plan's related trust intended to be tax exempt under Section 501(a) of the Code. As a tax-qualified retirement plan, contributions to our 401(k) Plan and earnings on those contributions are not taxable to the employees until distributed from our 401(k) Plan. We may, but are not required to, make matching contributions. We also pay, on behalf of our employees, approximately 80% of the premiums for health, life and disability insurance.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

Other than compensation arrangements, we describe below the transactions, and series of similar transactions, since our inception on June 17, 2015, to which we were a party or will be a party, in which:

- the amounts involved exceeded or will exceed $120,000; and
- any of our directors, executive officers or holders of more than 5% of our capital stock, or any member of the immediate family of the foregoing persons, had or will have a direct or indirect material interest.

Prior to this offering, we did not have a formal policy concerning transactions with related persons. In connection with this offering, we plan to adopt a written policy, effective upon completion of this offering, that requires all future transactions between us and any director, executive officer, holder of 5% or more of any class of our capital stock or any member of the immediate family of, or entities affiliated with, any of them, or any other related persons (as defined in Item 404 of Regulation S-K) or their affiliates, in which the amount involved is equal to or greater than $120,000, be approved in advance by our audit committee. Any request for such a transaction must first be presented to our audit committee for review, consideration and approval. In approving or rejecting any such proposal, our audit committee is to consider the relevant facts and circumstances available and deemed relevant to the audit committee, including, but not limited to, the extent of the related party's interest in the transaction, and whether the transaction is on terms no less favorable to us than terms we could have generally obtained from an unaffiliated third party under the same or similar circumstances.

Private Placements of Securities

Common Stock

In February 2016, we issued and sold an aggregate of 5,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $5.00 to Third Rock Ventures III, L.P., or TRV III, and 5,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $5.00 to Atlas Venture Fund X, L.P., or Atlas X. In November 2016, we issued and sold an aggregate of 245,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $245.00 to TRV III and 245,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $245.00 to Atlas X.

In November 2016, we issued and sold an aggregate of 2,700,000 shares of our restricted common stock at $0.001 per share for an aggregate purchase price of $2,700 to three of our directors, each an accredited investor, of which 2,000,000 shares of our common stock were sold to Dr. Scadden pursuant to a Founders Agreement whereby Dr. Scadden agreed to provide certain services to the Company. In November 2016, we issued and sold an aggregate of 4,127,438 shares of our restricted common stock at $0.001 per share to four executive officers in exchange for services to us. In March 2017, we issued and sold an aggregate of 350,000 shares of our restricted common stock at $0.01 per share for an aggregate purchase price of $3,500 to one executive officer in exchange for services to us. The following table summarizes purchases of our common stock by related persons.

Stockholder	Affiliated Director(s) or Officer(s)	Shares of Common Stock	Aggregate Purchase Price
5% Stockholders:			
Third Rock Ventures IV, L.P.(1)	Alexis A. Borisy	250,000	$ 250
Atlas Venture Fund X, L.P.(2)	Bruce Booth, D.Phil.	250,000	$ 250
Directors and Executive Officers:			
Jason Gardner, D,Phil.(3)		2,500,000	$ 2,500
David T. Scadden, M.D.(4)		2,000,000	$ 2,000
Michael W. Bonney		500,000	$ 500
Thomas O. Daniel, M.D.		200,000	$ 200
Bastiano Sanna, Ph.D.(5)		621,563	$ 622
Michael P. Cooke, Ph.D.		745,875	$ 746
Christina K. Isacson, Ph.D.		260,000	$ 260
Zoran Zdraveski, J.D., Ph.D.		350,000	$ 3,500

(1) In January 2017, TRV III transferred all of its shares in Magenta to Third Rock Ventures IV, L.P. or TRV IV. TRV IV is an affiliate fund of Third Rock Ventures, LLC, or TRV, and is a holder of five percent or more of our capital stock. Alexis Borisy is a partner at TRV and a member of our board of directors.

(2) Atlas X is an affiliate fund of Atlas Venture Associates X, LLC, or Atlas, and is a holder of five percent or more of our capital stock. Bruce Booth is a partner at Atlas and a member of our board of directors.

(3) 1,250,000 of Dr. Gardner’s shares were transferred to trusts in December 2017.

(4) 1,500,000 of Dr. Scadden’s shares were issued to a trust in November 2016.

(5) Dr. Sanna tendered his resignation on March 23, 2018, to be effective on March 30, 2018.

Series A Preferred Stock Financing

In November 2016, with a subsequent closing in April 2017, we issued and sold an aggregate of 35,663,974 shares of Series A preferred stock at a purchase price of $1.00 per share. Certain investors holding convertible notes issued in 2015 and 2016 used such notes to purchase our Series A preferred stock. Each share of our Series A preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering. The following table summarizes purchases of our Series A preferred stock by related persons:

Name	Shares of Series A Preferred	Aggregate Purchase Price Paid
Third Rock Ventures IV, L.P.(1)	20,102,478	$20,102,478(2)
Atlas Venture Fund X, L.P.(3)	12,061,496	$12,061,496(4)
GV 2016, L.P.(5)	133,400	$ 133,400
Jason Gardner, D.Phil.	66,700	$ 66,700
David T. Scadden, M.D.	50,025	$ 50,025
Michael W. Bonney	50,025	$ 50,025
Thomas O. Daniel, M.D.	33,350	$ 33,350
Bastiano Sanna, Ph.D.(6)	50,025	$ 50,025
Michael P. Cooke, Ph.D.	10,005	$ 10,005
Christina K. Isacson. Ph.D.	6,670	$ 6,670

(1) TRV IV is an affiliate fund of TRV and is a holder of five percent or more of our capital stock. Alexis Borisy is a partner at TRV and a member of our board of directors.

(2) $4,477,489 of TRV IV's purchase price was funded by the cancellation or conversion of indebtedness (including principal and interest) under certain convertible promissory notes, issued by us to TRV III from December 2015 to September 2016. TRV III transferred their 4,477,489 shares of Series A preferred stock to TRV IV on January 30, 2017.

(3) Atlas X is an affiliate fund of Atlas Venture Associates X, LLC, or Atlas, and is a holder of five percent or more of our capital stock. Bruce Booth is a partner at Atlas and a member of our board of directors.

(4) $2,686,495 of Atlas X's purchase price was funded by the cancellation or conversion of indebtedness (including principal and interest) under certain convertible promissory notes, issued by us to Atlas X from December 2015 to September 2016.

(5) GV 2016, L.P., an affiliate fund of GV, and is a holder of five percent or more of our capital stock. Blake Byers is a partner at GV and a member of our board of directors.

(6) Dr. Sanna tendered his resignation on March 23, 2018, to be effective on March 30, 2018.

Series B Preferred Stock Financing

In April 2017, with a subsequent closing in June 2017, we issued and sold an aggregate of 13,514,553 shares of Series B preferred stock at a purchase price of $3.8847 per share. Each share of our Series B preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering. The following table summarizes purchases of our Series B preferred stock by related persons:

Name	Shares of Series B Preferred	Aggregate Purchase Price Paid
Third Rock Ventures IV, L.P.(1)	340,566	$ 1,322,997
Atlas Venture Fund X, L.P.(2)	204,339	$ 793,796
GV 2016, L.P. (3)	8,494,864	$ 32,999,998
Jason Gardner, D.Phil.	34,314	$ 133,300
David T. Scadden, M.D.	6,429	$ 24,975
Michael W. Bonney	6,429	$ 24,975
Thomas O. Daniel, M.D.	30,028	$ 116,650
Bastiano Sanna, Ph.D.(4)	19,300	$ 74,975
Michael P. Cooke, Ph.D.	1,287	$ 5,000
Christina K. Isacson, Ph.D.	857	$ 3,329

(1) TRV IV is an affiliate fund of TRV and is a holder of five percent or more of our capital stock. Alexis Borisy is a partner at TRV and a member of our board of directors.

(2) Atlas X is an affiliate fund of Atlas Venture Associates X, LLC, or Atlas, and is a holder of five percent or more of our capital stock. Bruce Booth is a partner at Atlas and a member of our board of directors.

(3) GV 2016, L.P., an affiliate fund of GV, and is a holder of five percent or more of our capital stock. Blake Byers is a partner at GV and a member of our board of directors.

(4) Dr. Sanna tendered his resignation on March 23, 2018, to be effective on March 30, 2018.

License Agreement with Novartis

In April 2017, we entered into a license agreement with Novartis pursuant to which we were granted a worldwide license to certain intellectual property rights owned or controlled by Novartis, including patents, patent applications, proprietary information, know-how and other intellectual property, to develop, commercialize and sell one or more therapeutic products comprising research, develop and commercialize certain Novartis compounds for expansion of cord blood derived non-gene-edited/-modified HSCs. See “Business—Licenses and Collaboration—Alliance with Novartis.” As additional consideration for the license, we issued to Novartis 2,500,000 shares of Series A preferred stock and 643,550 shares of Series B preferred stock, which we determined to have a total fair value of approximately $9.3 million. Novartis is a beneficial owner of 5% or more of our outstanding shares of our capital stock.

Agreements with Stockholders

In connection with the Series B preferred stock financing, we entered into the Amended and Restated Investors’ Rights Agreement, or the Investors’ Rights Agreement, dated as of April 21, 2017, with certain of our stockholders, including our principal stockholders and their affiliates and the Amended and Restated Stockholders Agreement, dated as of April 21, 2017, with certain of our stockholders, including our principal stockholders and their affiliates. All of the material provisions of these agreements will terminate immediately prior to the completion of this offering, other than the provisions relating to registration rights, which will continue in effect following the completion of this offering and entitle the holders of such rights to have us register their shares of our common stock for sale in the U.S. See “Description of Capital Stock—Registration Rights.”

Executive Officer and Director Compensation

See “Executive Compensation” for information regarding compensation of directors and executive officers.

Employment Agreements

We have entered into offer letters or employment agreements with each of our executive officers. For more information regarding our agreements with our named executive officers for the fiscal year ended December 31, 2017, see “Executive Compensation—Narrative to Summary Compensation Table—Employment Arrangements with Our Named Executive Officers.”

Director Agreements

Indemnification Agreements

We have entered into or plan to enter into indemnification agreements with each of our directors and executive officers, the form of which is attached as an exhibit to the registration statement of which this prospectus is a part. The indemnification agreements and our amended and restated certificate of incorporation and amended and restated bylaws require us to indemnify our directors and officers to the fullest extent permitted by Delaware law.

PRINCIPAL STOCKHOLDERS

The following table presents information concerning the beneficial ownership of the shares of our common stock as of February 28, 2018, by:

- each person we know to be the beneficial owner of 5% or more of our outstanding shares of our capital stock;
- each of our directors;
- each of our named executive officers; and
- all of our executive officers and directors as a group.

We have determined beneficial ownership in accordance with SEC rules. The information does not necessarily indicate beneficial ownership for any other purpose. Under these rules, a person is deemed to be a beneficial owner of our common stock if that person has a right to acquire ownership within 60 days by the exercise of options or the conversion of our redeemable convertible preferred stock. A person is also deemed to be a beneficial owner of our common stock if that person has or shares voting power, which includes the power to vote or direct the voting of our common stock, or investment power, which includes the power to dispose of or to direct the disposition of such capital stock. Except in cases where community property laws apply or as indicated in the footnotes to this table, we believe that each stockholder identified in the table possesses sole voting and investment power over all shares of common stock shown as beneficially owned by the stockholder.

Percentage of beneficial ownership in the table below is based on 60,673,380 shares of common stock deemed to be outstanding as of February 28, 2018, assuming the conversion of all outstanding shares of redeemable convertible preferred stock into an aggregate of 49,178,527 shares of common stock upon the completion of this offering, and the percentage of beneficial ownership after this offering in the table below is based on shares of common stock assumed to be outstanding after the completion of this offering. The table below assumes that the underwriters do not exercise their option to purchase additional shares. If the underwriters exercise their option to purchase additional shares in full, we will sell an aggregate of additional shares of common stock. Shares of common stock subject to options that are currently exercisable or exercisable within 60 days of February 28, 2018 are considered outstanding and beneficially owned by the person holding the options for the purpose of computing the percentage ownership of that person but are not treated as outstanding for the purpose of computing the percentage ownership of any other person. Unless otherwise indicated below, the address of each individual listed below is c/o Magenta Therapeutics, Inc., 50 Hampshire Street, 8th Floor, Cambridge, MA 02139.

Name and Address of Beneficial Owner	Number of Shares Beneficially Owned before Offering	Percentage of Shares Beneficially Owned before Offering	Percentage of Shares Beneficially Owned after Offering
5% or Greater Stockholders:			
Third Rock Ventures IV, L.P.(1)	20,693,044	34.11%	%
Atlas Venture X, L.P.(2)	12,515,835	20.63%	%
GV 2016, L.P.(3)	8,628,264	14.22%	%
Novartis Institutes for Biomedical Research, Inc.(4)	3,143,550	5.18%	%
Named Executive Officers and Directors:			
Jason Gardner, D.Phil.(5)	2,613,514	4.31%	%
Michael P. Cooke, Ph.D.(6)	767,898	1.27%	%
Bastiano Sanna, Ph.D.(7)	701,619	1.16%	%
Jeffrey Albers(8)	25,312	*%	%
Michael W. Bonney(9)	556,454	*%	%
Bruce Booth, D.Phil.(2)	—	— %	%
Alexis A. Borisy(1)	—	— %	%
Blake Byers, Ph.D.(3)(10)	—	— %	%
Thomas O. Daniel, M.D.(11)	263,378	*%	%
Amy Ronneberg	—	— %	%
David T. Scadden, M.D.(12)	2,056,454	3.39%	%
All executive officers and directors as a group (fifteen persons)(13)	7,628,167	12.56%	%

* Represents beneficial ownership of less than one percent.

(1) Consists of: (i) 250,000 shares of common stock held by Third Rock Ventures IV, L.P., or TRV IV; (ii) 20,102,478 shares of common stock issuable upon conversion of shares of Series A preferred stock held by TRV IV; and (iii) 340,566 shares of common stock issuable upon conversion of shares of Series B preferred stock held by TRV IV. The general partner of TRV IV is Third Rock Ventures GP IV, L.P., or TRV GP IV LP. The general partner of TRV GP IV LP is TRV GP IV, LLC, or TRV GP IV LLC. Abbie Celniker, Ph.D., Robert Tepper, M.D., Alexis Borisy, Craig Muir and Cary Pfeffer, M.D. are the managing members of TRV GP IV LLC who collectively make voting and investment decisions with respect to shares held by TRV IV.

(2) Consists of: (i) 250,000 shares of common stock; (ii) 12,061,496 shares of common stock issuable upon conversion of shares of Series A preferred stock held by Atlas Venture Associates X, LP, or Atlas X, and (iii) 204,339 shares of common stock issuable upon conversion of shares of Series B preferred stock held by Atlas X. All shares are held directly by Atlas X. Atlas Venture Associates X, L.P., or Atlas Associates X, is the general partner of Atlas X, and Atlas Venture Associates X, LLC, or AVA X, is the general partner of

Atlas Associates X. Peter Barrett, Bruce Booth, Jean-François Formela, David Grayzel and Jason Rhodes are the members of AVA X and collectively make investment decisions on behalf of Atlas X. Dr. Booth is also a member of our board of directors. Dr. Booth disclaims beneficial ownership of such shares, except to the extent of his pecuniary interest therein, if any. The address for Atlas X is 400 Technology Square, 10th Floor, Cambridge, Massachusetts 02139.

(3) Consists of: (i) 133,400 shares of common stock issuable upon conversion of shares of Series A preferred stock held by GV 2016, L.P. and (ii) 8,494,864 shares of common stock issuable upon conversion of shares of Series B preferred stock held by GV 2016, L.P. GV 2016 GP, L.P., the general partner of GV 2016, L.P., GV 2016 GP L.L.C., the general partner of GV 2016 GP, L.P., Alphabet Holdings LLC, the sole member of GV 2016 GP L.L.C., XXVI Holdings Inc., the managing member of Alphabet Holdings LLC, and Alphabet Inc., the sole stockholder of XXVI Holdings Inc., may each be deemed to have sole power to vote or dispose of these shares. The principal business address of GV 2016, L.P., GV 2016 GP, L.P., GV 2016 GP L.L.C., Alphabet Holdings LLC, XXVI Holdings Inc., and Alphabet Inc. is 1600 Amphitheatre Parkway, Mountain View, California 94043.

(4) Consists of (i) 2,500,000 shares of common stock issuable upon conversion of shares of Series A preferred stock and (ii) 643,550 shares of common stock issuable upon conversion of shares of Series B preferred stock. All shares are held by Novartis Institutes for BioMedical Research, Inc., or Novartis. Novartis is an indirect wholly-owned subsidiary of, and controlled by, Novartis AG. The address for Novartis is 250 Massachusetts Avenue, Cambridge, Massachusetts 02139.

(5) Consists of: (i) 2,500,000 shares of common stock, (ii) 12,500 shares of common stock underlying options exerciseable within 60 days of February 28, 2018, (iii) 66,700 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iv) 34,314 shares of common stock issuable upon conversion of shares of Series B preferred stock. 1,250,000 of Dr. Gardner's shares of common stock and all of his shares of Series A preferred stock and Series B preferred stock were transferred to trusts in December 2017.

(6) Consists of: (i) 745,875 shares of restricted common stock, (ii) 10,731 shares of common stock underlying options exerciseable within 60 days of February 28, 2018, (iii) 10,005 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iv) 1,287 shares of common stock issuable upon conversion of shares of Series B preferred stock.

(7) Consists of: (i) 621,563 shares of restricted common stock, (ii) 10,731 shares of common stock underlying options exerciseable within 60 days of February 28, 2018, (iii) 50,025 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iv) 19,300 shares of common stock issuable upon conversion of shares of Series B preferred stock. Dr. Sanna tendered his resignation on March 23, 2018, to be effective on March 30, 2018.

(8) Consists of shares of common stock underlying options exerciseable within 60 days of February 28, 2018.

(9) Consists of: (i) 500,000 shares of restricted common stock, (ii) 50,025 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iii) 6,429 shares of common stock issuable upon conversion of shares of Series B preferred stock.

(10) Excludes shares listed in footnote 3 above, which are held by GV 2016, L.P. Dr. Byers is a partner at GV and a member of our board of directors, but does not have voting or dispositive power over the shares held by GV 2016, L.P.

(11) Consists of: (i) 200,000 shares of restricted common stock; (ii) 33,350 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iii) 30,028 shares of common stock issuable upon conversion of shares of Series B preferred stock.

(12) Consists of: (i) 2,000,000 shares of common stock, (ii) 50,025 shares of common stock issuable upon conversion of the Series A preferred stock and (iii) 6,429 shares of common stock issuable upon conversion of shares of Series B preferred stock. 1,500,000 of Dr. Scadden's shares of common stock were issued to a trust in November 2016.

(13) See notes 5 through 12 above; also includes Christina K. Isacson, Zoran Zdraveski and John C. Davis, Jr., who are executive officers but not named executive officers, and Cindy Driscoll, our principal financial officer.

DESCRIPTION OF CAPITAL STOCK

Upon the completion of this offering and after giving effect to the conversion into common stock and retirement of all outstanding shares of our redeemable convertible preferred stock, our authorized capital stock will consist of shares of common stock, par value $0.001 per share, and shares of preferred stock, par value $0.001 per share, all of which will be undesignated, and there will be shares of common stock outstanding and no shares of preferred stock outstanding. As of December 31, 2017, we had approximately 54 record holders of our capital stock. All of our outstanding shares of redeemable convertible preferred stock will convert into shares of our common stock upon the completion of this offering. In addition, upon the completion of this offering, options to purchase shares of our common stock will be outstanding and shares of our common stock will be reserved for future grants under our equity incentive plans.

The following description of our capital stock and provisions of our amended and restated certificate of incorporation and amended and restated bylaws are summaries of material terms and provisions and are qualified by reference to our amended and restated certificate of incorporation and amended and restated bylaws, copies of which have been filed with the SEC as exhibits to the registration statement of which this prospectus is a part. The descriptions of our common stock and preferred stock reflect amendments to our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering.

Common Stock

Upon the completion of this offering, we will be authorized to issue one class of common stock. Holders of our common stock are entitled to one vote for each share of common stock held of record for the election of directors and on all matters submitted to a vote of stockholders. Holders of our common stock are entitled to receive dividends ratably, if any, as may be declared by our board of directors out of legally available funds, subject to any preferential dividend rights of any preferred stock then outstanding. The holders of our common stock do not have any cumulative voting rights. Upon our dissolution, liquidation or winding up, holders of our common stock are entitled to share ratably in our net assets legally available after the payment of all our debts and other liabilities, subject to the preferential rights of any preferred stock then outstanding. Holders of our common stock have no preemptive, subscription, redemption or conversion rights and no sinking fund provisions are applicable to our common stock. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future. Except as described under “Antitakeover Effects of Delaware Law and Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws” below, a majority vote of the holders of common stock is generally required to take action under our amended and restated certificate of incorporation and amended and restated bylaws.

Preferred Stock

Upon the completion of this offering, our board of directors will be authorized, without action by the stockholders, to designate and issue up to an aggregate of shares of preferred stock in one or more series. Our board of directors can designate the rights, preferences and privileges of the shares of each series and any of its qualifications, limitations or restrictions. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of common stock. The issuance of preferred stock, while providing flexibility in connection with possible future financings and acquisitions and other corporate purposes could, under certain circumstances, have the effect of restricting dividends on our common stock, diluting the voting power of our common stock, impairing the liquidation rights of our common stock, or delaying, deferring or preventing a change in control of our company, which might harm the market price of our common stock. See also “Antitakeover Effects of Delaware Law and Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws—Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws—Undesignated preferred stock” below.

Our board of directors will make any determination to issue such shares based on its judgment as to our company's best interests and the best interests of our stockholders. Upon the completion of this offering, we will have no shares of preferred stock outstanding and we have no current plans to issue any shares of preferred stock following completion of this offering.

Registration Rights

Upon the completion of this offering, the holders of 49,178,527 shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock, or their permitted transferees, which we refer to as our registrable securities, are entitled to rights with respect to the registration of these securities under the Securities Act. These rights are provided under the terms of the Investors' Rights Agreement. The Investors' Rights Agreement includes demand registration rights, short-form registration rights and piggyback registration rights. All fees, costs and expenses incurred in connection with registrations under the Investors' Rights Agreement will be borne by us, and all selling expenses, including underwriting discounts and selling commissions, will be borne by the holders of the shares being registered.

Demand Registration Rights

Upon the completion of this offering, the holders of our registrable securities are entitled to demand registration rights. Under the terms of the investor rights agreement, we will be required, upon the request of holders of at least 25% of our outstanding registrable securities, to file a registration statement with an anticipated offering amount of at least $3.0 million and use commercially reasonable efforts to effect the registration of these shares for public resale. We are required to effect up to two registrations pursuant to this provision of the Investors' Rights Agreement. A demand for registration may not be made until six months after the effective date of the registration statement for this offering.

Short Form Registration Rights

Upon the completion of this offering, the holders of our registrable securities are also entitled to short form registration rights. Pursuant to the Investors' Rights Agreement, if we are eligible to file a registration statement on Form S-3, upon the request of holders of at least 10% of our outstanding registrable securities to sell registrable securities with an anticipated aggregate offering amount of at least $1.0 million, we will be required to use our commercially reasonable efforts to effect a registration of such shares. We are required to effect up to two registrations in any twelve month period pursuant to this provision of the Investors' Rights Agreement.

Piggyback Registration Rights

The holders of our registrable securities are entitled to piggyback registration rights. If we register any of our securities either for our own account or for the account of other security holders, the holders of our outstanding registrable securities are entitled to include their shares in the registration. Subject to certain exceptions contained in the Investors' Rights Agreement, we and the underwriters may limit the number of shares included in the underwritten offering if the underwriters determine that marketing factors require a limitation of the number of shares to be underwritten.

Indemnification

Our Investors' Rights Agreement contains customary cross-indemnification provisions, under which we are obligated to indemnify holders of registrable securities in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions attributable to them.

Expiration of Registration Rights

The registration rights granted under the investor rights agreement will terminate upon the earlier of (i) a deemed liquidation event, as defined in our amended and restated certificate of incorporation (as in effect prior to the completion of this offering) or certain other events constituting a sale of the company, (ii) at such time after our initial public offering when all registrable securities could be sold under Rule 144 of the Securities Act or a similar exemption without limitation during a three-month period without registration or (iii) the fifth anniversary of our initial public offering.

Antitakeover Effects of Delaware Law and Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Certain provisions of the Delaware General Corporation Law and of our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids and, as a consequence, they might also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our board of directors. These provisions might also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Delaware Takeover Statute

Upon completion of this offering, we will be subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, our board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances, but not the outstanding voting stock owned by the interested stockholder; or
- at or after the time the stockholder became interested, the business combination was approved by our board of directors and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, lease, pledge, exchange, mortgage or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;

- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Our amended and restated certificate of incorporation and amended and restated bylaws to be in effect upon completion of this offering will include a number of provisions that may have the effect of delaying, deferring or discouraging another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board composition and filling vacancies. In accordance with our amended and restated certificate of incorporation, our board is divided into three classes serving staggered three-year terms, with one class being elected each year. Our amended and restated certificate of incorporation also provides that directors may be removed only for cause and then only by the affirmative vote of the holders of % or more of the shares then entitled to vote at an election of directors. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

No written consent of stockholders. Our amended and restated certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting. This limit may lengthen the amount of time required to take stockholder actions and would prevent the amendment of our bylaws or removal of directors by our stockholder without holding a meeting of stockholders.

Meetings of stockholders. Our bylaws provide that only a majority of the members of our board of directors then in office may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance notice requirements. Our bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days or more than 120 days prior to the first anniversary date of the annual meeting for the preceding year. The notice must contain certain information specified in our bylaws.

Amendment to certificate of incorporation and bylaws. As required by the Delaware General Corporation Law, any amendment of our amended and restated certificate of incorporation must first be approved by a majority of our board of directors, and if required by law or our amended and restated certificate of incorporation, must thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to stockholder action, directors, limitation of liability and the amendment of our amended and restated certificate of incorporation must be approved by not less than % of the outstanding shares entitled to

vote on the amendment, and not less than % of the outstanding shares of each class entitled to vote thereon as a class. Our bylaws may be amended by the affirmative vote of a majority vote of the directors then in office, subject to any limitations set forth in the bylaws; and may also be amended by the affirmative vote of at least % of the outstanding shares entitled to vote on the amendment, or, if the board of directors recommends that the stockholders approve the amendment, by the affirmative vote of the majority of the outstanding shares entitled to vote on the amendment, in each case voting together as a single class.

Undesignated preferred stock. Our amended and restated certificate of incorporation provides for authorized shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of us or our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our amended and restated certificate of incorporation grants our board of directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is . The transfer agent and registrar's address is .

Listing

We have applied to list our common stock on The NASDAQ Global Market under the symbol "MGTA."

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no public market for our common stock. Future sales of our common stock in the public market, or the availability of such shares for sale in the public market, could adversely affect market prices prevailing from time to time. As described below, only a limited number of shares will be available for sale shortly after this offering due to contractual and legal restrictions on resale. Nevertheless, sales of our common stock in the public market after such restrictions lapse, or the perception that those sales may occur, could adversely affect the prevailing market price at such time and our ability to raise equity capital in the future.

Based on the number of shares of common stock outstanding as of February 28, 2018, upon completion of this offering, shares of common stock will be outstanding, assuming no exercise by the underwriters of their option to purchase additional shares and no exercise of options. All of the shares sold in this offering will be freely tradable. The remaining shares of common stock outstanding after this offering will be restricted as a result of securities laws or lock-up agreements as described below. Following the expiration of the lock-up period, all shares will be eligible for resale in compliance with Rule 144 or Rule 701 under the Securities Act. “Restricted securities” as defined under Rule 144 of the Securities Act were issued and sold by us in reliance on exemptions from the registration requirements of the Securities Act. These shares may be sold in the public market only if registered or qualified for an exemption from registration, such as under Rule 144 or Rule 701 under the Securities Act.

Rule 144

In general, a person who has beneficially owned restricted stock for at least six months would be entitled to sell their securities provided that (i) such person is not deemed to have been one of our affiliates at the time of, or at any time during the 90 days preceding, a sale and (ii) we are subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale. Persons who have beneficially owned restricted shares for at least six months but who are our affiliates at the time of, or any time during the 90 days preceding, a sale, would be subject to additional restrictions, by which such person would be entitled to sell within any three-month period only a number of securities that does not exceed the greater of either of the following:

- 1% of the number of shares then outstanding, which will equal approximately shares immediately after this offering assuming no exercise of the underwriters’ option to purchase additional shares, based on the number of shares outstanding as of December 31, 2017; or
- the average weekly trading volume of our common stock on The NASDAQ Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to the sale;

provided, in each case, that we have been subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale. Such sales both by affiliates and by non-affiliates must also comply with the manner of sale, current public information and notice provisions of Rule 144.

Rule 701

Rule 701 under the Securities Act, or Rule 701, as in effect on the date of this prospectus, permits resales of shares in reliance upon Rule 144 but without compliance with certain restrictions of Rule 144, including the holding period requirement. Most of our employees, executive officers or directors who purchased shares under a written compensatory plan or contract may be entitled to rely on the resale provisions of Rule 701, but all holders of Rule 701 shares are required to wait until 90 days after the date of this prospectus before selling their shares. However, substantially all Rule 701 shares are subject to lock-up agreements as described below and under “Underwriting” included elsewhere in this prospectus and will become eligible for sale upon the expiration of the restrictions set forth in those agreements.

Lock-up Agreements

In connection with this offering, we, each of our directors and executive officers, and holders of approximately shares of our outstanding stock have agreed with the underwriters that for a period of 180 days following the date of this prospectus, subject to certain exceptions, we will not offer, sell, assign, transfer, pledge, contract to sell or otherwise dispose of or hedge any shares of our common stock or any securities convertible into or exchangeable for shares of our common stock. J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC may, in their sole discretion, at any time, release all or any portion of the shares from the restrictions in this agreement.

Rule 10b5-1 Trading Plans

Following the completion of this offering, certain of our officers, directors and other employees may adopt written plans, known as Rule 10b5-1 trading plans, in which they will contract with a broker to buy or sell shares of our common stock on a periodic basis to diversify their assets and investments. Under these 10b5-1 trading plans, a broker may execute trades pursuant to parameters established by the officer or director when entering into the plan, without further direction from such officer or director. Such sales would not commence until the expiration of the applicable lock-up agreements entered into by such officer or director in connection with this offering.

Registration Rights

We are party to an investor rights agreement which provides that holders holding shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock, have the right to demand that we file a registration statement or request that their shares of our common stock be covered by a registration statement that we are otherwise filing. See “Description of Capital Stock—Registration Rights” in this prospectus. Except for shares purchased by affiliates, registration of their shares under the Securities Act would result in these shares becoming freely tradable without restriction under the Securities Act immediately upon effectiveness of the registration, subject to the expiration of the lock-up period described above and under “Underwriting” in this prospectus, and to the extent such shares have been released from any repurchase option that we may hold.

Equity Incentive Plans

As soon as practicable after the completion of this offering, we intend to file a Form S-8 registration statement under the Securities Act to register shares of our common stock subject to options outstanding or reserved for issuance under our equity incentive plans. This registration statement will become effective immediately upon filing, and shares covered by this registration statement will thereupon be eligible for sale in the public markets, subject to Rule 144 limitations applicable to affiliates and any lock-up agreements. For a more complete discussion of our equity incentive plans, see “Executive Compensation—Compensation Plans.”

MATERIAL U.S. FEDERAL INCOME TAX CONSIDERATIONS FOR NON-U.S. HOLDERS

The following discussion is a summary of the material U.S. federal income tax considerations applicable to non-U.S. holders (as defined below) with respect to their ownership and disposition of shares of our common stock issued pursuant to this offering. For purposes of this discussion, a non-U.S. holder means a beneficial owner of our common stock that is for U.S. federal income tax purposes:

- a non-resident alien individual;
- a foreign corporation or any other foreign organization taxable as a corporation for U.S. federal income tax purposes; or
- a foreign estate or trust, the income of which is not subject to U.S. federal income tax on a net income basis.

This discussion does not address the tax treatment of partnerships or other entities that are pass-through entities for U.S. federal income tax purposes or persons that hold their common stock through partnerships or other pass-through entities. A partner in a partnership or other pass-through entity that will hold our common stock should consult his, her or its tax advisor regarding the tax consequences of acquiring, holding and disposing of our common stock through a partnership or other pass-through entity, as applicable.

This discussion is based on current provisions of the U.S. Internal Revenue Code of 1986, as amended, which we refer to as the Code, existing and proposed U.S. Treasury Regulations promulgated thereunder, current administrative rulings and judicial decisions, all as in effect as of the date of this prospectus and, all of which are subject to change or to differing interpretation, possibly with retroactive effect. Any such change or differing interpretation could alter the tax consequences to non-U.S. holders described in this prospectus. There can be no assurance that the Internal Revenue Service, which we refer to as the IRS, will not challenge one or more of the tax consequences described herein. We assume in this discussion that a non-U.S. holder holds shares of our common stock as a capital asset within the meaning of Section 1221 of the Code, generally property held for investment.

This discussion does not address all aspects of U.S. federal income taxation that may be relevant to a particular non-U.S. holder in light of that non-U.S. holder's individual circumstances nor does it address any aspects of any U.S. federal tax other than the income tax, U.S. state, local or non-U.S. taxes, the alternative minimum tax, or the Medicare tax on net investment income. This discussion also does not consider any specific facts or circumstances that may apply to a non-U.S. holder and does not address the special tax rules applicable to particular non-U.S. holders, such as:

- insurance companies;
- tax-exempt or governmental organizations;
- financial institutions;
- brokers or dealers in securities;
- regulated investment companies;
- pension plans;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and partners and investors therein);
- persons deemed to sell our common stock under the constructive sale provisions of the Code;

- persons that hold our common stock as part of a straddle, hedge, conversion transaction, synthetic security or other integrated investment;
- persons who hold or receive our common stock pursuant to the exercise of any employee stock option or otherwise as compensation; and
- certain U.S. expatriates.

This discussion is for general information only and is not tax advice. Accordingly, all prospective non-U.S. holders of our common stock should consult their tax advisors with respect to the U.S. federal, state, local and non-U.S. tax consequences of the purchase, ownership and disposition of our common stock.

Distributions on Our Common Stock

Distributions, if any, on our common stock will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If a distribution exceeds our current and accumulated earnings and profits, the excess will be treated as a tax-free return of the non-U.S. holder's investment, up to such holder's tax basis in the common stock. Any remaining excess will be treated as capital gain, subject to the tax treatment described below in "Gain on Sale or Other Taxable Disposition of Our Common Stock." Any such distributions will also be subject to the discussions below under the sections titled "Backup Withholding and Information Reporting" and "Withholding and Information Reporting Requirements—FATCA."

Subject to the discussion in the following two paragraphs in this section, dividends paid to a non-U.S. holder generally will be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

Dividends that are treated as effectively connected with a trade or business conducted by a non-U.S. holder within the United States and, if an applicable income tax treaty so provides, that are attributable to a permanent establishment or a fixed base maintained by the non-U.S. holder within the United States, are generally exempt from the 30% withholding tax if the non-U.S. holder satisfies applicable certification and disclosure requirements. However, dividends that are treated as U.S. effectively connected income, net of specified deductions and credits, are taxed at the same graduated U.S. federal income tax rates applicable to United States persons (as defined in the Code). Any U.S. effectively connected income received by a non-U.S. holder that is a corporation may also, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

A non-U.S. holder of our common stock who claims the benefit of an applicable income tax treaty between the United States and such holder's country of residence generally will be required to provide a properly executed IRS Form W-8BEN or W-8BEN-E (or successor form) to the applicable withholding agent and satisfy applicable certification and other requirements. Non-U.S. holders are urged to consult their tax advisors regarding their entitlement to benefits under a relevant income tax treaty. A non-U.S. holder that is eligible for a reduced rate of U.S. withholding tax under an income tax treaty may obtain a refund or credit of any excess amounts withheld by timely filing a U.S. tax return with the IRS.

Gain on Sale or Other Taxable Disposition of Our Common Stock

Subject to the discussions below under "Backup Withholding and Information Reporting" and "Withholding and Information Reporting Requirements—FATCA," a non-U.S. holder generally will not be subject to any U.S. federal income tax on any gain realized upon such holder's sale or other taxable disposition of shares of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a U.S. trade or business and, if an applicable income tax treaty so provides, is attributable to a permanent establishment or a fixed-base

maintained by such non-U.S. holder in the United States, in which case the non-U.S. holder generally will be taxed on a net income basis at the graduated U.S. federal income tax rates applicable to United States persons (as defined in the Code) and, if the non-U.S. holder is a foreign corporation, the branch profits tax described above in "Distributions on Our Common Stock" also may apply;

- the non-U.S. holder is a nonresident alien individual who is present in the United States for 183 days or more in the taxable year of the disposition and certain other conditions are met, in which case the non-U.S. holder will be subject to a 30% tax (or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence) on the net gain derived from the disposition, which may be offset by certain U.S. source capital losses of the non-U.S. holder, if any (even though the individual is not considered a resident of the United States), provided that the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses; or
- we are, or have been, at any time during the five-year period preceding such sale of other taxable disposition (or the non-U.S. holder's holding period, if shorter) a "U.S. real property holding corporation," unless our common stock is regularly traded on an established securities market and the non-U.S. holder holds no more than 5% of our outstanding common stock, directly or indirectly, actually or constructively, during the shorter of the 5-year period ending on the date of the disposition or the period that the non-U.S. holder held our common stock. Generally, a corporation is a U.S. real property holding corporation only if the fair market value of its U.S. real property interests equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. Although there can be no assurance, we do not believe that we are, or have been, a U.S. real property holding corporation, or that we are likely to become one in the future. No assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rules described above.

Backup Withholding and Information Reporting

We must report annually to the IRS and to each non-U.S. holder the gross amount of the distributions on our common stock paid to such holder and the tax withheld, if any, with respect to such distributions. Non-U.S. holders may have to comply with specific certification procedures to establish that the holder is not a United States person (as defined in the Code) in order to avoid backup withholding at the applicable rate with respect to dividends on our common stock. Dividends paid to non-U.S. holders subject to withholding of U.S. federal income tax, as described above in "Distributions on Our Common Stock," generally will be exempt from U.S. backup withholding.

Information reporting and backup withholding will generally apply to the proceeds of a disposition of our common stock by a non-U.S. holder effected by or through the U.S. office of any broker, U.S. or foreign, unless the holder certifies its status as a non-U.S. holder and satisfies certain other requirements, or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions effected through a U.S. office of a broker. Non-U.S. holders should consult their tax advisors regarding the application of the information reporting and backup withholding rules to them. Copies of information returns may be made available to the tax authorities of the country in which the non-U.S. holder resides or is incorporated under the provisions of a specific treaty or agreement. Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules from a payment to a non-U.S. holder can be refunded or credited against the non-U.S. holder's U.S. federal income tax liability, if any, provided that an appropriate claim is filed with the IRS in a timely manner.

Withholding and Information Reporting Requirements—FATCA

The Foreign Account Tax Compliance Act, or FATCA, generally imposes a U.S. federal withholding tax at a rate of 30% on payments of dividends on, or gross proceeds from the sale or other disposition of, our common stock paid to a foreign entity unless (i) if the foreign entity is a "foreign financial institution," such foreign entity undertakes certain due diligence, reporting, withholding, and certification obligations, (ii) if the foreign entity is not a "foreign financial institution," such foreign entity identifies certain of its U.S. investors, if any, or (iii) the foreign entity is otherwise exempt under FATCA. Under applicable U.S. Treasury regulations, withholding under FATCA currently applies to payments of dividends on our common stock, but will only apply to payments of gross proceeds from a sale or other disposition of our common stock made after December 31, 2018. Under certain circumstances, a non-U.S. holder may be eligible for refunds or credits of this withholding tax. An intergovernmental agreement between the United States and an applicable foreign country may modify the requirements described in this paragraph. Non-U.S. holders should consult their tax advisors regarding the possible implications of this legislation on their investment in our common stock and the entities through which they hold our common stock, including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of the 30% withholding tax under FATCA.

UNDERWRITING

We are offering the shares of common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Cowen and Company, LLC are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the representatives. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the initial public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of common stock listed next to its name in the following table:

Name	Number of Shares
J.P. Morgan Securities LLC	
Goldman Sachs & Co. LLC	
Cowen and Company, LLC	
Wedbush Securities Inc.	
Total	

The underwriters are committed to purchase all the common shares offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the common shares directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to $ per share from the initial public offering price. After the initial offering of the shares to the public, if all of the common shares are not sold at the initial public offering price, the underwriters may change the offering price and the other selling terms. Sales of shares made outside of the United States may be made by affiliates of the underwriters. The offering of the shares by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

The underwriters have an option to buy up to additional shares of common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this option to purchase additional shares. If any shares are purchased with this option to purchase additional shares, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is $ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without option to purchase additional shares exercise	With full option to purchase additional shares exercise
Per share	$	$
Total	$	$

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be

approximately $. We have agreed to reimburse the underwriters for expenses of up to $ related to clearance of this offering with FINRA.

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in this offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that we will not (i) offer, pledge, announce the intention to sell, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase or otherwise dispose of, directly or indirectly, or file with the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, or (ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case, without the prior written consent of J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, for a period of 180 days after the date of this prospectus, other than the shares of our common stock to be sold hereunder and any shares of our common stock issued upon the exercise of options granted under our existing management incentive plans.

Our directors and executive officers, and certain of our significant shareholders have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each of these persons or entities, with limited exceptions, for a period of 180 days after the date of this prospectus, or the restricted period, may not, without the prior written consent of J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, (1) offer, pledge, announce the intention to sell, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors, executive officers, managers and members in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant) or (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the common stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of common stock or such other securities, in cash or otherwise, or (3) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock, in each case, subject to certain exceptions, including:

(A) any shares of our common stock sold by such director, executive officer or significant shareholder in this offering;

(B) transfers of shares of common stock as a bona fide gift or gifts;

(C) transfers of shares of common stock or other securities to a trust or limited family partnership for the direct or indirect benefit of the transferor or the immediate family of the transferor in a transaction not involving a disposition for value;

(D) transfers of shares of common stock or other securities by will, other testamentary document or intestate succession in a transaction not involving a disposition for value;

(E) transfers of shares of common stock or other securities pursuant to a court order in respect of, or by operation of law as a result of, a divorce, in a transaction not involving a disposition for value;

(F) the exercise, including by and to the extent necessary to cover any "net" exercise, of any options or warrants to acquire shares of common stock expiring during the restricted period referred to above or the conversion of any convertible security into shares of common stock in accordance with its terms;

(G) transfers of shares of common stock or other securities to a limited liability company or partnership wholly-owned and controlled by the transferor in a transaction not involving a disposition for value;

(H) if such entity is a trust, transfers of shares of common stock or other securities to any beneficiary of such trust or the estate of any such beneficiary in a transaction not involving a disposition for value;

(I) transfers or distributions of shares of common stock to members, limited partners, stockholders or affiliates of, or any investment fund or other entity that controls or manages the transferor in a transaction not involving a disposition for value; and

(J) transactions relating to shares of common stock or other securities purchased in this offering or in open market transactions during the restricted period;

provided that in the case of any transfer or distribution pursuant to clauses (B) through (E) and (G) through (I) each donee, distributee or transferee shall execute and deliver to J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC a lock-up agreement; and provided, further, that in the case of any transfer or distribution pursuant to clause (B) through (E) and (G) through (J), no filing by any party (donor, donee, transferor or transferee) under the Exchange Act or other public announcement shall be required or shall be made voluntarily in connection with such transfer or distribution (other than a filing on a Form 5 made after the expiration of the restricted period and any required Schedule 13G (or 13G/A)).

The lock-up agreements will not apply to the establishment of a written trading plan by any director, executive officer or stockholder pursuant to Rule 10b5-1 under the Exchange Act for the sale of shares of common stock, provided that such plan does not provide for the sale of common stock during the restricted period referred to above and no public announcement or filing under the Exchange Act, if any, is required of or is voluntarily made by or on behalf of such director, executive officer or stockholder or us regarding such plan.

We have agreed to indemnify the several underwriters against certain liabilities, including liabilities under the Securities Act.

We have applied to list our common stock on The NASDAQ Global Market under the symbol "MGTA".

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involves the sale by the underwriters of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be "covered" shorts, which are short positions in an amount not greater than the underwriters' option to purchase additional shares referred to above, or may be "naked" shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their option to purchase additional shares, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act of 1933, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the

imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The NASDAQ Global Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors, including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common shares, or that the shares will trade in the public market at or above the initial public offering price.

Other relationships

The underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include sales and trading, commercial and investment banking, advisory, investment management, investment research, principal investment, hedging, market making, brokerage and other financial and non-financial activities and services. Certain of the underwriters and their affiliates have provided in the past to us and our affiliates, and may provide from time to time in the future, certain commercial banking, financial advisory or investment banking advice or other services in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. In addition, from time to time, certain of the underwriters and their respective affiliates, officers, directors and employees may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future. The underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of the company's securities and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in the company's securities.

Selling restrictions

General

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required.

The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 *Prospectus Exemptions* or subsection 73.3(1) of the *Securities Act* (Ontario), and are permitted clients, as defined in National Instrument 31-103 *Registration Requirements, Exemptions and Ongoing Registrant Obligations*. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 *Underwriting Conflicts* (NI 33-105), the representatives are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

European Economic Area

In relation to each Member State of the European Economic Area that has implemented the Prospectus Directive (each, a "Relevant Member State"), an offer to the public of our common shares may not be made in that Relevant Member State, except that an offer to the public in that Relevant Member State of our common shares may be made at any time under the following exemptions under the Prospectus Directive:

(a) to any legal entity that is a qualified investor as defined in the Prospectus Directive;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive), subject to obtaining the prior consent of the Representatives for any such offer; or

(c) in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of shares of our common stock shall result in a requirement for the publication by us or any underwriter of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer to the public" in relation to our common shares in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and our common shares to be offered so as to enable an investor to decide to purchase our common shares, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State; and the expression "Prospectus Directive" means Directive 2003/71/EC (as amended), including by Directive 2010/73/EU, and includes any relevant implementing measure in the Relevant Member State.

Hong Kong

The shares may not be offered or sold by means of any document other than (i) in circumstances that do not constitute an offer to the public within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), or (ii) to "professional investors" within the meaning of the Securities and Futures Ordinance (Cap.571, Laws of Hong Kong) and any rules made thereunder, or (iii) in other circumstances that do not result in the document being a "prospectus" within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), and no advertisement, invitation or document relating to the shares may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the laws of Hong Kong) other than with respect to shares that are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" within the meaning of the Securities and Futures Ordinance (Cap. 571, Laws of Hong Kong) and any rules made thereunder.

Japan

The securities have not been and will not be registered under the Financial Instruments and Exchange Law of Japan, or the Financial Instruments and Exchange Law, and each underwriter has agreed that it will not offer or sell any securities, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term, as used in this prospectus means any person resident in Japan, including any corporation or other entity organized under the laws of Japan) or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Law and any other applicable laws, regulations and ministerial guidelines of Japan.

Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore, or the SFA, (ii) to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 by a relevant person that is: (a) a corporation (which is not an accredited investor) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or (b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary is an accredited investor, shares, debentures and units of shares and debentures of that corporation or the beneficiaries' rights and interest in that trust shall not be transferable for six months after that corporation or that trust has acquired the shares under Section 275 except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA; (2) where no consideration is given for the transfer; or (3) by operation of law.

Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or SIX, or on any other stock exchange or regulated trading facility in Switzerland. This document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules

or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document, nor any other offering or marketing material relating to the shares or this offering, may be publicly distributed or otherwise made publicly available in Switzerland. Neither this document nor any other offering or marketing material relating to this offering, the Company, the shares has been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, or FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

United Arab Emirates

This prospectus relates to an Exempt Offer in accordance with the Offered Securities Rules of the Dubai Financial Services Authority, or DFSA. This prospectus is intended for distribution only to persons of a type specified in the Offered Securities Rules of the DFSA. It must not be delivered to, or relied on by, any other person. The DFSA has no responsibility for reviewing or verifying any documents in connection with Exempt Offers. The DFSA has not approved this prospectus nor taken steps to verify the information set forth herein and has no responsibility for this prospectus. The shares to which this prospectus relates may be illiquid and/or subject to restrictions on their resale. Prospective purchasers of the shares offered should conduct their own due diligence on the shares. If you do not understand the contents of this prospectus, you should consult an authorized financial advisor.

United Kingdom

This document is only being distributed to and is only directed at (i) persons who are outside the United Kingdom or (ii) to investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, or the Order, or (iii) high net worth entities, and other persons to whom it may lawfully be communicated, falling with Article 49(2)(a) to (d) of the Order (all such persons together being referred to as “relevant persons”). The securities are only available to, and any invitation, offer or agreement to subscribe, purchase or otherwise acquire such securities will be engaged in only with, relevant persons. Any person who is not a relevant person should not act or rely on this document or any of its contents.

LEGAL MATTERS

The validity of the common stock offered hereby will be passed upon for us by Goodwin Procter LLP, Boston, Massachusetts and for the underwriters by Davis Polk & Wardwell LLP, New York, New York.

EXPERTS

The financial statements of Magenta Therapeutics, Inc. as of December 31, 2016 and 2017 and for each of the years then ended are included herein in reliance upon the report of KPMG LLP, independent registered public accounting firm, appearing elsewhere herein, and upon the authority of said firm as experts in accounting and auditing.

The audit report covering the December 31, 2017 financial statements contains an explanatory paragraph that states that the Company has suffered recurring losses from operations, expects to continue to incur operating losses for the foreseeable future, and will need to raise additional capital to finance its future operations, which raise substantial doubt about its ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of that uncertainty.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act that registers the shares of our common stock to be sold in this offering. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules filed as part of the registration statement. For further information with respect to us and our common stock, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. Statements contained in this prospectus concerning the contents of any contract or any other document are not necessarily complete. If a contract or document has been filed as an exhibit to the registration statement, we refer you to the copy of the contract or document that has been filed. Each statement in this prospectus relating to a contract or document filed as an exhibit is qualified in all respects by the filed exhibit. The reports and other information we file with the SEC can be read and copied at the SEC's Public Reference Room at 100 F Street, NE, Washington D.C. 20549. Copies of these materials can be obtained at prescribed rates from the Public Reference Section of the SEC at the principal offices of the SEC, 100 F Street, NE, Washington D.C. 20549. You may obtain information regarding the operation of the public reference room by calling 1(800) SEC-0330. The SEC also maintains a web site (http://www.sec.gov) that contains reports, proxy and information statements and other information regarding issuers like us that file electronically with the SEC.

Upon completion of this offering, we will become subject to the reporting and information requirements of the Exchange Act and, as a result, will file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information will be available for inspection and copying at the SEC's public reference room and the web site of the SEC referred to above.

INDEX TO FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Magenta Therapeutics, Inc.:

Opinion on the Financial Statements

We have audited the accompanying balance sheets of Magenta Therapeutics, Inc. (the Company) as of December 31, 2016 and 2017, the related statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' deficit, and cash flows for each of the years then ended and the related notes (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2016 and 2017, and the results of its operations and its cash flows for each of the years then ended, in conformity with U.S. generally accepted accounting principles.

Going concern

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the financial statements, the Company has suffered recurring losses from operations, expects to continue to incur operating losses for the foreseeable future, and will need to raise additional capital to finance its future operations, which raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The financial statements do not include any adjustments that might result from the outcome of this uncertainty. Our opinion is not modified with respect to this matter.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP
We have served as the Company's auditor since 2017.

Cambridge, Massachusetts
March 28, 2018

MAGENTA THERAPEUTICS, INC.

BALANCE SHEETS

(In thousands, except share and per share amounts)

	December 31,		Pro Forma December 31,
	2016	2017	2017 (unaudited)
Assets			
Current assets:			
Cash and cash equivalents	$ 4,513	$ 51,402	$ 51,402
Restricted cash	30	165	165
Other receivables	6,250	—	—
Prepaid expenses and other current assets	41	936	936
Total current assets	10,834	52,503	52,503
Property and equipment, net	508	1,956	1,956
Other assets	—	4	4
Total assets	$11,342	$ 54,463	$ 54,463
Liabilities, Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit)			
Current liabilities:			
Accounts payable	$ 1,667	$ 167	$ 167
Accrued expenses	633	3,975	3,975
Total current liabilities	2,300	4,142	4,142
Commitments and contingencies (Note 11)			
Redeemable convertible preferred stock (Series A and B), $0.001 par value; 48,700,000 and 49,178,527 shares authorized as of December 31, 2016 and 2017, respectively; 17,718,974 and 49,178,527 shares issued and outstanding as of December 31, 2016 and 2017, respectively; aggregate liquidation preference of $88,164 as of December 31, 2017; no shares authorized, issued or outstanding, pro forma as of December 31, 2017 (unaudited)	17,916	92,439	—
Stockholders' Equity (Deficit):			
Common stock, $0.001 par value; 70,000,000 shares authorized as of December 31, 2016 and 2017; 12,795,853 and 11,520,853 shares issued and 3,483,529 and 6,075,577 shares outstanding as of December 31, 2016 and 2017, respectively; 60,699,380 shares issued and 55,254,104 outstanding, pro forma as of December 31, 2017 (unaudited)	3	6	55
Additional paid-in capital	843	3,087	95,477
Accumulated deficit	(9,720)	(45,211)	(45,211)
Total stockholders' equity (deficit)	(8,874)	(42,118)	50,321
Total liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)	$11,342	$ 54,463	$ 54,463

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

(In thousands, except share and per share amounts)

	Year Ended December 31,	
	2016	2017
Revenue	$ —	$ —
Operating expenses:		
Research and development	5,782	27,899
General and administrative	3,486	7,828
Total operating expenses	9,268	35,727
Loss from operations	(9,268)	(35,727)
Other income (expense):		
Interest expense	(163)	—
Interest and other income, net	—	236
Total other income (expense), net	(163)	236
Net loss and comprehensive loss	(9,431)	(35,491)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634
Net loss attributable to common stockholders	$ (9,735)	$ (35,507)
Net loss per share attributable to common stockholders—basic and diluted	$ (25.21)	$ (7.40)
Weighted average common shares outstanding—basic and diluted	386,083	4,798,213
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)		$ (0.80)
Pro forma weighted average common shares outstanding—basic and diluted (unaudited)		44,294,374

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF REDEEMABLE CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' DEFICIT

(In thousands, except share amounts)

	Series A and B Redeemable Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balances at December 31, 2015	—	$ —	—	$ —	$ —	$ (289)	$ (289)
Issuance of Series A redeemable convertible preferred stock, net of issuance costs of $107	10,554,990	10,448	—	—	—	—	—
Conversion of notes payable and accrued interest into Series A redeemable convertible preferred stock	7,163,984	7,164	—	—	—	—	—
Vesting of restricted stock	—	—	1,998,529	2	11	—	13
Issuance of common stock in connection with payment of consultant fees	—	—	490,000	—	157	—	157
Issuance of common stock in connection with a license agreement	—	—	995,000	1	317	—	318
Accretion of Series A redeemable convertible preferred stock to redemption value	—	107	—	—	(107)	—	(107)
Cumulative dividends on redeemable convertible preferred stock	—	197	—	—	(197)	—	(197)
Stock-based compensation expense	—	—	—	—	662	—	662
Net loss	—	—	—	—	—	(9,431)	(9,431)
Balances at December 31, 2016	17,718,974	17,916	3,483,529	3	843	(9,720)	(8,874)
Issuance of Series A redeemable convertible preferred stock	15,445,000	15,445	—	—	—	—	—
Issuance of Series B redeemable convertible preferred stock, net of issuance costs of $213	12,871,003	49,787	—	—	—	—	—
Issuance of Series A and B redeemable convertible preferred stock in connection with a license agreement	3,143,550	9,275	—	—	—	—	—
Vesting of restricted stock	—	—	2,582,048	3	1	—	4
Issuance of common stock in connection with payment of consultant fees	—	—	10,000	—	—	—	—
Accretion of Series B redeemable convertible preferred stock to redemption value	—	213	—	—	(213)	—	(213)
Cumulative dividends on Series A redeemable convertible preferred stock	—	437	—	—	(437)	—	(437)
Reversal of Series A redeemable convertible preferred stock dividend	—	(634)	—	—	634	—	634
Stock-based compensation expense	—	—	—	—	2,259	—	2,259
Net loss	—	—	—	—	—	(35,491)	(35,491)
Balances at December 31, 2017	49,178,527	$92,439	6,075,577	$ 6	$ 3,087	$ (45,211)	$ (42,118)

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF CASH FLOWS

(In thousands)

	Year ended December 31,	
	2016	2017
Cash flows from operating activities:		
Net loss	$ (9,431)	$ (35,491)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation expense	662	2,259
Depreciation and amortization expense	6	376
Non-cash interest expense	163	—
License fees paid in common stock	318	—
License fees paid in preferred stock	—	9,275
Consultant fees paid in common stock	157	—
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(41)	(895)
Accounts payable	1,006	(1,125)
Accrued expenses	631	3,342
Other assets	—	(4)
Net cash used in operating activities	(6,529)	(22,263)
Cash flows from investing activities:		
Purchases of property and equipment	(139)	(2,199)
Change in restricted cash	(30)	(135)
Net cash used in investing activities	(169)	(2,334)
Cash flows from financing activities:		
Proceeds from issuance of redeemable convertible preferred stock	4,305	71,695
Proceeds from issuance of convertible notes payable	6,500	—
Payments of redeemable convertible preferred stock issuance costs	(107)	(213)
Proceeds from issuance of common and restricted stock	13	4
Net cash provided by financing activities	10,711	71,486
Net increase in cash and cash equivalents	4,013	46,889
Cash and cash equivalents at beginning of period	500	4,513
Cash and cash equivalents at end of period	$ 4,513	$ 51,402
Supplemental disclosure of non-cash investing and financing activities:		
Purchases of property and equipment included in accounts payable and accrued expenses	$ 375	$ —
Conversion of notes payable and accrued interest into redeemable convertible preferred stock	$ 7,164	$ —
Other receivable from investor for redeemable convertible preferred stock	$ 6,250	$ —
Accretion of redeemable convertible preferred stock to redemption values	$ 107	$ 213
Cumulative dividends on Series A redeemable convertible preferred stock	$ 197	$ 437
Reversal of cumulative dividends on Series A redeemable convertible preferred stock	$ —	$ (634)

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

NOTES TO FINANCIAL STATEMENTS

1. Nature of the Business and Basis of Presentation

Magenta Therapeutics, Inc. (the "Company") is a clinical-stage biopharmaceutical company developing novel medicines to bring the curative power of bone marrow transplant to more patients. The Company was incorporated under the laws of the State of Delaware in June 2015 as HSCTCo Therapeutics, Inc. In February 2016, the Company changed its name to Magenta Therapeutics, Inc.

The Company is subject to risks and uncertainties common to early-stage companies in the biotechnology industry, including, but not limited to, development by competitors of new technological innovations, dependence on key personnel, protection of proprietary technology, compliance with government regulations and the ability to secure additional capital to fund operations. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel and infrastructure and extensive compliance-reporting capabilities. Even if the Company's drug development efforts are successful, it is uncertain when, if ever, the Company will realize significant revenue from product sales.

Going Concern

In accordance with Accounting Standards Update ("ASU") 2014-15, *Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern (Subtopic 205-40)*, the Company has evaluated whether there are conditions and events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern within one year after the date that the financial statements are issued.

Since inception, the Company has funded its operations primarily with proceeds from the sales of redeemable convertible preferred stock and issuance of convertible notes. The Company has incurred recurring losses since inception, including net losses of $9.4 million for the year ended December 31, 2016 and $35.5 million for the year ended December 31, 2017. As of December 31, 2017, the Company had an accumulated deficit of $45.2 million. The Company expects to continue to generate operating losses for the foreseeable future. As of March 28, 2018, the issuance date of the financial statements for the year ended December 31, 2017, the Company expects that its cash and cash equivalents will not be sufficient to fund its operating expenses and capital expenditure requirements through 12 months from the date of issuance of those financial statements.

Based on its recurring losses from operations incurred since inception, expectation of continuing operating losses for the foreseeable future, and the need to raise additional capital to finance its future operations, the Company has concluded that there is substantial doubt about its ability to continue as a going concern within one year after the date that the financial statements are issued. The accompanying financial statements do not include any adjustments that might result from the outcome of this uncertainty. Accordingly, the financial statements have been prepared on a basis that assumes the Company will continue as a going concern and which contemplates the realization of assets and satisfaction of liabilities and commitments in the ordinary course of business.

The Company is seeking to complete an initial public offering ("IPO") of its common stock. Upon the closing of a qualified public offering on specified terms, the Company's outstanding redeemable convertible preferred stock will automatically convert into shares of common stock (see Note 7). In the event the Company does not complete an IPO, the Company expects to seek additional funding through private equity financings, debt financings, or other capital sources, including collaborations with other companies, or other strategic

transactions. The Company may not be able to obtain funding on acceptable terms, or at all. The terms of any financing may adversely affect the holdings or the rights of the Company's stockholders.

If the Company is unable to obtain funding, the Company could be forced to delay, reduce or eliminate some or all of its research and development programs, product portfolio expansion or commercialization efforts, which could adversely affect its business prospects, or the Company may be unable to continue operations. Although management continues to pursue these plans, there is no assurance that the Company will be successful in obtaining sufficient funding on terms acceptable to the Company to fund continuing operations, if at all.

The financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP").

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting periods. Significant estimates and assumptions reflected in these financial statements include, but are not limited to, the accrual for research and development expenses and the valuation of common and preferred stock and stock-based awards. Estimates are periodically reviewed in light of changes in circumstances, facts and experience. Changes in estimates are recorded in the period in which they become known. Actual results could differ from those estimates.

Unaudited Pro Forma Information

The accompanying unaudited pro forma balance sheet as of December 31, 2017 has been prepared to give effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock into 49,178,527 shares of common stock as if the Company's proposed initial public offering had occurred on December 31, 2017.

In the accompanying statements of operations and comprehensive loss, the unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2017 has been prepared to give effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock as if the Company's proposed initial public offering had occurred on the later of January 1, 2017 or the issuance date of the redeemable convertible preferred stock.

Concentrations of Credit Risk and of Significant Suppliers

Financial instruments that potentially expose the Company to concentrations of credit risk consist primarily of cash and cash equivalents. The Company maintains all cash and cash equivalents at one accredited financial institution. The Company does not believe that it is subject to unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

The Company is dependent on third-party manufacturers to supply products for research and development activities in its programs. In particular, the Company relies and expects to continue to rely on a small number of manufacturers to supply it with its requirements for the active pharmaceutical ingredients and formulated drugs related to these programs. These programs could be adversely affected by a significant interruption in the supply of active pharmaceutical ingredients and formulated drugs.

Deferred Offering Costs

The Company capitalizes certain legal, professional accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated.

After consummation of the equity financing, these costs are recorded in stockholders' deficit as a reduction of additional paid-in capital generated as a result of the offering. Should the in-process equity financing be abandoned, the deferred offering costs will be expensed immediately as a charge to operating expenses in the statements of operations and comprehensive loss. As of December 31, 2016 and 2017, the Company had not recorded any deferred offering costs.

Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less at the date of purchase to be cash equivalents.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation and amortization. Depreciation and amortization expense is recognized using the straight-line method over the estimated useful life of each asset as follows:

	Estimated Useful Life
Lab equipment	5 years
Computer equipment	3 years
Furniture and fixtures	5 years
Leasehold improvements	Shorter of life of lease or estimated useful life

Upon retirement or sale, the cost of assets disposed of and the related accumulated depreciation and amortization are removed from the accounts and any resulting gain or loss is included in loss from operations. Expenditures for repairs and maintenance are charged to expense as incurred.

Impairment of Long-Lived Assets

Long-lived assets consist of property and equipment. Long-lived assets to be held and used are tested for recoverability whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. Factors that the Company considers in deciding when to perform an impairment review include significant underperformance of the business in relation to expectations, significant negative industry or economic trends and significant changes or planned changes in the use of the assets. If an impairment review is performed to evaluate a long-lived asset group for recoverability, the Company compares forecasts of undiscounted cash flows expected to result from the use and eventual disposition of the long-lived asset group to its carrying value. An impairment loss would be recognized when estimated undiscounted future cash flows expected to result from the use of an asset group are less than its carrying amount. The impairment loss would be based on the excess of the carrying value of the impaired asset group over its fair value, determined based on discounted cash flows. The Company did not record any impairment losses on long-lived assets during the years ended December 31, 2016 or 2017.

Fair Value Measurements

Certain assets and liabilities are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. Financial assets and liabilities carried at fair value are to be

classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to determining the fair value of the assets or liabilities, including pricing models, discounted cash flow methodologies and similar techniques.

The Company's cash equivalents are carried at fair value, determined according to the fair value hierarchy described above (see Note 3). The carrying values of the Company's other receivables, accounts payable and accrued expenses approximate their fair values due to the short-term nature of these assets and liabilities.

Classification and Accretion of Redeemable Convertible Preferred Stock

The Company has classified redeemable convertible preferred stock outside of stockholders' equity (deficit) because the shares contain certain redemption features that are not solely within the control of the Company. The Company immediately accretes the carrying value of its redeemable convertible preferred stock to redemption value at the end of each reporting period as if the end of the reporting period were the redemption date.

Segment Information

The Company manages its operations as a single segment for the purposes of assessing performance and making operating decisions. All of the Company's tangible assets are held in the United States.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses are comprised of costs incurred in performing research and development activities, including salaries, share-based compensation and benefits, facilities costs, depreciation, manufacturing expenses and external costs of outside vendors engaged to conduct preclinical development activities and clinical trials as well as the cost of licensing technology.

Upfront payments and milestone payments made for the licensing of technology are expensed as research and development in the period in which they are incurred. Advance payments for goods or services to be received in the future for use in research and development activities are recorded as prepaid expenses. The prepaid amounts are expensed as the related goods are delivered or the services are performed.

Research Contract Costs and Accruals

The Company has entered into various research and development contracts with research institutions and other companies both inside and outside of the United States. These agreements are generally cancelable, and related payments are recorded as research and development expenses as incurred. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies or trials, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from the actual costs.

Patent Costs

All patent-related costs incurred in connection with filing and prosecuting patent applications are expensed as incurred due to the uncertainty about the recovery of the expenditure. Amounts incurred are classified as general and administrative expenses.

Stock-Based Compensation

The Company measures all stock-based awards granted to employees and directors based on the fair value on the date of grant. Compensation expense of those awards is recognized over the requisite service period, which is generally the vesting period of the respective award. Generally, the Company issues awards with only service-based vesting conditions and records the expense for these awards using the straight-line method. The Company accounts for forfeitures as they occur.

The Company measures the fair value of stock-based awards granted to non-employees on the date at which the related service is complete. Compensation expense is recognized over the period during which services are rendered by such non-employee consultants until completed. At the end of each financial reporting period prior to completion of the service, the fair value of these awards is remeasured using the then-current fair value of its common stock and updated assumption inputs in the Black-Scholes option-pricing model for options or the then-current fair value of its common stock for restricted stock.

The Company classifies stock-based compensation expense in its statements of operations and comprehensive loss in the same manner in which the award recipient's payroll costs are classified or in which the award recipient's service payments are classified.

Income Taxes

The Company accounts for income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the financial statements or in the Company's tax returns. Deferred taxes are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect in the years in which the differences are expected to reverse. Changes in deferred tax assets and liabilities are recorded in the provision for income taxes. The Company assesses the likelihood that its deferred tax assets will be recovered from future taxable income and, to the extent it believes, based upon the weight of available evidence, that it is more likely than not that all or a portion of deferred tax assets will not be realized, a valuation allowance is established through a charge to income tax expense. Potential for recovery of deferred tax assets is evaluated by estimating the future taxable profits expected and considering prudent and feasible tax planning strategies.

The Company accounts for uncertainty in income taxes recognized in its financial statements by applying a two-step process to determine the amount of tax benefit to be recognized. First, the tax position must be evaluated to determine the likelihood that it will be sustained upon external examination by the taxing authorities. If the tax position is deemed more-likely-than-not to be sustained, the tax position is then assessed to determine the amount of benefit to recognize in the financial statements. The amount of the benefit that may be recognized is the largest amount that has a greater than 50% likelihood of being realized upon ultimate settlement. The provision for income taxes includes the effects of any resulting tax reserves, or unrecognized tax benefits, that are considered appropriate as well as the related net interest and penalties.

Comprehensive Loss

Comprehensive loss includes net loss as well as other changes in stockholders' deficit that result from transactions and economic events other than those with stockholders. There was no difference between net loss and comprehensive loss for each of the periods presented in the accompanying financial statements.

Net Loss per Share

The Company follows the two-class method when computing net income (loss) per share, as the Company has issued shares that meet the definition of participating securities. The two-class method determines net income (loss) per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income available to common stockholders for the period to be allocated between common and participating securities based upon their respective rights to receive dividends as if all income for the period had been distributed.

Basic net income (loss) per share attributable to common stockholders is computed by dividing the net income (loss) attributable to common stockholders by the weighted average number of shares of common stock outstanding for the period. Diluted net income (loss) attributable to common stockholders is computed by adjusting income (loss) attributable to common stockholders to reallocate undistributed earnings based on the potential impact of dilutive securities, including outstanding stock options and unvested restricted common stock. Diluted net income (loss) per share attributable to common stockholders is computed by dividing the diluted net income (loss) attributable to common stockholders by the weighted average number of common shares outstanding for the period, including potential dilutive common shares assuming the dilutive effect of outstanding stock options and unvested restricted common stock.

The Company's outstanding redeemable convertible preferred stock contractually entitle the holders of such shares to participate in distributions but contractually does not require the holders of such shares to participate in losses of the Company. Similarly, restricted stock awards granted by the Company entitle the holder of such awards to dividends declared or paid by the board of directors, regardless of whether such awards are unvested, as if such shares were outstanding common shares at the time of the dividend. However, the unvested restricted stock awards are not entitled to share in the residual net assets (deficit) of the Company. Accordingly, in periods in which the Company reports a net loss attributable to common stockholders, diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders, since dilutive common shares are not assumed to have been issued if their effect is anti-dilutive.

The Company reported a net loss attributable to common stockholders for the years ended December 31, 2016 and 2017.

Recently Adopted Accounting Pronouncements

In August 2014, the Financial Accounting Standards Board ("FASB") issued ASU No. 2014-15, *Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern* ("ASU 2014-15"). The amendments in this update explicitly require a company's management to assess an entity's ability to continue as a going concern and to provide related footnote disclosures in certain circumstances. The new standard is effective for annual periods ending after December 15, 2016 and for interim periods thereafter. The Company adopted ASU 2014-15 as of the required effective date of December 31, 2016. This guidance relates to footnote disclosure only, and its adoption had no impact on the Company's financial position, results of operations or cash flows.

In November 2015, the FASB issued ASU No. 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes* ("ASU 2015-17"), which requires deferred tax liabilities and assets to be classified as non-current in the balance sheet. ASU 2015-17 is required to be adopted for annual periods beginning after December 15, 2016, including interim periods within those fiscal years. The amendment may be applied either prospectively to all deferred tax liabilities and assets or retrospectively to all periods presented. The Company elected to early adopt the standard on January 1, 2016 and has reflected the adoption retrospectively to all periods presented. The adoption of ASU 2015-17 had no impact on the Company's financial position, results of operations or cash flows.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* ("ASU 2016-09"). ASU 2016-09 includes multiple

provisions intended to simplify various aspects of the accounting for share-based payments, including the income tax consequences, classification of awards as either equity or liabilities, an option to recognize gross share compensation expense with actual forfeitures recognized as they occur, as well as certain classifications on the statement of cash flows. The Company elected to early adopt the standard on January 1, 2016 and has reflected the adoption in the financial statements of the Company retrospectively to all periods presented. The adoption of ASU 2016-09 had no material impact on the Company's financial position, results of operations or cash flows. The Company elected to account for forfeitures as they occur rather than apply an estimated forfeiture rate to stock-based compensation expense.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases* ("ASU 2016-02"). ASU 2016-02 will require lessees to recognize most leases on their balance sheet as a right-of-use asset and a lease liability. Leases will be classified as either operating or finance, and classification will be based on criteria similar to current lease accounting, but without explicit bright lines. For public entities, the guidance is effective for annual reporting periods beginning after December 15, 2018 and for interim periods within those fiscal years. For non-public entities, the guidance is effective for annual reporting periods beginning after December 15, 2019. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2016-02 will have on its financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows: Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), to address diversity in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. For public entities, the standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. For non-public entities, the standard is effective for annual periods beginning after December 15, 2018. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2016-15 will have on its financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Statement of Cash Flows (Topic 230)* ("ASU 2016-18"), which requires that amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. For public entities, ASU 2016-18 is effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years. For non-public entities, the standard is effective for fiscal years beginning after December 15, 2018. Early adoption is permitted for all entities. The Company is currently evaluating the impact of ASU 2016-18 on its financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting* ("ASU 2017-09"), which clarifies when to account for a change to the terms or conditions of a share-based payment award as a modification. Under the new guidance, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award (as equity or liability) changes as a result of the change in terms or conditions. For public and non-public entities, the standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. Early adoption is permitted. The Company is currently evaluating the impact that the adoption of ASU 2017-09 will have on its financial statements. The Company does not expect that the adoption of ASU 2017-09 will have a material impact on its financial statements.

In July 2017, the FASB issued ASU No. 2017-11, *Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815) I. Accounting for Certain Financial Instruments with Down Round Features II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception* ("ASU 2017-11"). Part I applies to entities that issue financial instruments such as warrants, convertible debt or convertible preferred stock that contain down-round features. Part II replaces the

indefinite deferral for certain mandatorily redeemable noncontrolling interests and mandatorily redeemable financial instruments of nonpublic entities contained within ASC Topic 480 with a scope exception and does not impact the accounting for these mandatorily redeemable instruments. For public entities, ASU 2017-11 is required to be adopted for annual periods beginning after December 15, 2018, including interim periods within those fiscal years. For non-public entities, ASU 2017-11 is effective for annual periods beginning after December 15, 2019. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2017-11 will have on its financial statements.

3. Fair Value of Financial Assets

The following tables present information about the Company's financial assets measured at fair value on a recurring basis and indicate the level of the fair value hierarchy utilized to determine such fair values (in thousands):

	Fair Value Measurements at December 31, 2017 Using			
	Level 1	Level 2	Level 3	Total
Cash equivalents:				
Money market funds	$51,147	$ —	$ —	$51,147
Total	$51,147	$ —	$ —	$51,147

The Company had no cash equivalents as of December 31, 2016. During the year ended December 31, 2017, there were no transfers between Level 1, Level 2 and Level 3.

4. Property and Equipment, Net

Property and equipment, net consisted of the following (in thousands):

	December 31,	
	2016	2017
Laboratory and computer equipment	$514	$2,120
Leasehold improvements	—	141
Furniture and fixtures	—	77
	514	2,338
Less: Accumulated depreciation and amortization	(6)	(382)
	$508	$1,956

Depreciation and amortization expense was less than $0.1 million and $0.4 million for the years ended December 31, 2016 and 2017, respectively.

5. Accrued Expenses

Accrued expenses consisted of the following (in thousands):

	December 31,	
	2016	2017
Accrued external research and development expenses	$—	$1,531
Accrued payroll and related expenses	506	1,330
Accrued professional fees	66	963
Accrued other	61	151
	$633	$3,975

6. Convertible Promissory Notes

In December 2015, the Company issued convertible promissory notes in the aggregate principal amount of $0.5 million. In 2016, the Company issued convertible promissory notes in the amount of $6.5 million. The notes accrued interest at an annual rate of 6% payable upon maturity at one year after issuance. In November 2016, the total outstanding principal and accrued interest on the notes of $7.2 million converted into 7,163,984 shares of the Company's Series A redeemable convertible preferred stock (the "Series A Preferred Stock") at a price of $1.00 per share. The convertible promissory notes did not contain any features which were required to be bifurcated and accounted for separately.

7. Redeemable Convertible Preferred Stock

As of December 31, 2017, the Company's certificate of incorporation, as amended and restated (the "Certificate of Incorporation"), authorized the Company to issue 49,178,527 shares of $0.001 par value preferred stock, of which 35,663,974 shares have been designated as Series A Preferred Stock and 13,514,553 shares have been designated as Series B redeemable convertible preferred stock (the "Series B Preferred Stock"). The Series A Preferred Stock and Series B Preferred Stock are collectively referred to as the "Preferred Stock".

Series A Preferred Stock Purchase Agreement

In November 2016, the Company entered into a Series A Preferred Stock purchase agreement and issued 17,718,974 shares of Series A Preferred Stock at $1.00 per share for gross proceeds of $10.6 million and the conversion of principal and accrued interest of $7.2 million on convertible promissory notes (see Note 6). Cash proceeds of $6.3 million were received in January 2017 and therefore, classified as other receivable in the Company's balance sheet at December 31, 2016. The Company incurred issuance costs of $0.1 million in connection with the issuance and sale of the Series A Preferred Stock.

The Series A Preferred Stock purchase agreement obligated the Company to sell and the Purchasers (as defined) to purchase at $1.00 per share an aggregate of 15,445,000 shares of Series A Preferred Stock at a subsequent closing (the "First Subsequent Closing") and at the Company's sole discretion an aggregate of 15,500,000 shares of Series A Preferred Stock at a second subsequent closing (the "Second Subsequent Closing"), upon the achievement or waiver of certain milestones. In April 2017, in connection with the First Subsequent Closing and the waiver of the applicable milestones, the Company received gross proceeds of $15.4 million for the issuance and sale of 15,445,000 shares of Series A Preferred Stock. The Company determined that the future tranche obligations of the Series A Preferred Stock purchase agreement did not meet the definition of a freestanding financial instrument because, while separately exercisable, it was not legally detachable. Further, the Company determined that the embedded future tranche obligation did not require bifurcation for accounting purposes as it was clearly and closely related to the economic characteristics and risks of the initial preferred shares and would not meet the definition of a derivative on a standalone basis. There was no Second Subsequent Closing.

Series B Preferred Stock Purchase Agreement

In April 2017, the Company entered into a Series B Preferred Stock purchase agreement and issued and sold 12,871,003 shares of Series B Preferred Stock at $3.8847 per share for gross proceeds of $50.0 million in two separate closings. The Company incurred issuance costs of $0.2 million in connection with the issuance and sale of the Series B Preferred Stock.

Issuance of Preferred Stock for License

In consideration for the grant of rights to the Company pursuant to a license agreement between the Company and Novartis International Pharmaceutical Ltd., ("Novartis"), dated April 3, 2017 (see Note 11), the Company issued 2,500,000 shares of Series A Preferred Stock and 643,550 shares of Series B Preferred Stock to Novartis.

Upon issuance of each class of Preferred Stock the Company assessed the embedded conversion and liquidation features of the securities and determined that such features did not require the Company to separately account for these features. The Company also concluded that no beneficial conversion feature existed upon the issuance date of each class of Preferred Stock.

As of each balance sheet date, the Preferred Stock consisted of the following (in thousands, except share amounts):

	December 31, 2016				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred Stock	48,700,000	17,718,974	$17,916	$ 17,916	17,718,974
	48,700,000	17,718,974	$17,916	$ 17,916	17,718,974

	December 31, 2017				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred Stock	35,663,974	35,663,974	$39,939	$ 35,664	35,663,974
Series B Preferred Stock	13,514,553	13,514,553	52,500	52,500	13,514,553
	49,178,527	49,178,527	$92,439	$ 88,164	49,178,527

The holders of the Preferred Stock have the following rights and preferences:

Voting Rights

The holders of Preferred Stock are entitled to vote, together with the holders of common stock, on all matters submitted to stockholders for a vote. Each preferred stockholder is entitled to the number of votes equal to the number of shares of common stock into which each Preferred Stock is convertible at the time of such vote.

Dividends

There are no stated dividends on the Preferred Stock.

At the time of issuance, the holders of Series A Preferred Stock were entitled to receive cumulative dividends at an annual rate of 8% of the Original Issue Price (as described below). However, in connection with the Series B Preferred Stock financing in April 2017, holders of Series A Preferred Stock waived their right to dividends. During the years ended December 31, 2016 and 2017, the Company accrued dividends of $0.2 million and $0.4 million, respectively, and recorded an increase to the carrying value of the Series A Preferred Stock with an offset to additional paid in capital. In April 2017, in connection with the elimination of dividends on the Series A Preferred Stock, the Company reduced the carrying value of the Series A Preferred Stock by $0.6 million with an offset to additional paid in capital.

The Company may not declare, pay or set aside any dividends on shares of any other class or series of capital stock of the Company unless the holders of Preferred Stock then outstanding shall first receive, or simultaneously receive, dividends on each outstanding share of Preferred Stock. Through December 31, 2017, no dividends had been approved or paid.

Liquidation

In the event of any liquidation, dissolution or winding up of the Company or Liquidating Event (as described below), the holders of Preferred Stock then outstanding shall be entitled, on a pari passu basis, to be paid out of the assets of the Company prior to any payments made to the holders of common stock by reason of their ownership thereof, an amount per share equal to the greater of the Original Issue Price (as described below) plus any dividends declared but unpaid or such amount per share as would have been payable had all shares of Preferred Stock been converted into common stock. If upon liquidation the assets of the Company available for distribution to its stockholders shall be insufficient to pay the holders of Preferred Stock the full amount, the holders of the shares of Preferred Stock shall share ratably in any distribution in proportion to respective amount of Preferred Stock.

Upon completion of the liquidation preference distribution to the holders of Preferred Stock, the remaining assets of the Company will be distributed among holders of common stock, pro rata, based on the number of shares held by each such holder.

Unless the holders of a majority of the outstanding Preferred Stock, voting together as a single class, and in certain circumstances, holders of a majority of the outstanding Series B Preferred Stock, voting as a separate class, elect otherwise, Liquidating Event shall include a merger or consolidation (other than one in which shareholders of the Company own a majority of the voting power of the outstanding shares of the surviving or acquiring corporation) or a sale, lease, transfer, exclusive license or other disposition of all or substantially all of the assets of the Company.

Conversion

Each share of Preferred Stock is convertible at the option of the stockholder at any time without the payment of additional consideration by the holder thereof, into a number of shares of common stock at the applicable conversion ratio determined by dividing the Original Issue Price by the Conversion Price of each series. The Original Issue Price is $1.00 per share for Series A Preferred Stock and $3.8847 per share for Series B Preferred Stock. The Conversion Price is $1.00 per share for Series A Preferred Stock and $3.8847 per share for Series B Preferred Stock, subject to appropriate adjustment in the event of any stock split, stock dividend, combination or other similar recapitalization and other adjustments as set forth in the Company's certificate of incorporation, as amended and restated.

Each share of Preferred Stock will automatically convert into shares of common stock at the then effective conversion ratio (i) upon the closing of an initial public offering with proceeds to the Company of at least $50.0 million, after deducting underwriting discounts and commissions or (ii) upon the vote or written consent of the holders of a majority of the then outstanding shares of the Preferred Stock, voting together as a single class, and holders of a majority of the outstanding Series B Preferred Stock, voting as a separate class.

As of December 31, 2016 and 2017, all outstanding Preferred Stock were convertible into common stock on a one-for-one basis.

Redemption Rights

At any time on or after April 21, 2022, shares of the Preferred Stock are subject to mandatory redemption by the Company in three equal annual installments beginning 60 days after receipt of a notice of redemption from the holders of a majority of the voting power of the holders of the outstanding Preferred Stock, voting as a single class. As of December 31, 2017, the redemption price for the Preferred Stock is equal to the Original Issuance Price per share, plus any accruing dividends accrued but unpaid therein.

Reissuance

Shares of any Preferred Stock that are redeemed or converted will be retired or canceled and may not be reissued by the Company.

8. Common Stock

As of December 31, 2017, the Company's Certificate of Incorporation authorized the Company to issue 70,000,000 shares of common stock, $0.001 par value. Each share of common stock entitles the holder to one vote on all matters submitted to a vote of the Company's stockholders. Common stockholders are not entitled to receive dividends unless declared by the board of directors.

The Company issued 500,000 shares of common stock to two investors in exchange for consulting services (see Note 14). In 2016, the Company issued 995,000 shares of common stock in connection with a license agreement (see Note 11). In 2016 and 2017, the Company issued 11,310,853 and 565,000 shares, respectively, of restricted stock to employees and consultants of the Company. Unvested shares of restricted stock may not be sold or transferred by the holder. These restrictions lapse according to the vesting conditions of each award (see Note 9).

9. Stock-Based Compensation

2016 Stock Option and Grant Plan

In November 2016, the Company's 2016 Stock Option and Grant Plan, (the "2016 Plan") was approved by the Company's stockholders. The 2016 Plan provides for the Company to sell or issue restricted common stock or to grant stock options for the purchase of common stock to employees, members of the board of directors and consultants of the Company. The 2016 Plan is administered by the board of directors, or at the discretion of the board of directors, by a committee of the board. The exercise prices, vesting and other restrictions are determined at the discretion of the board of directors, or their committee if so delegated, except that the term of awards may not be greater than ten years. Vesting periods are determined at the discretion of the board of directors. Awards granted to employees and directors typically vest over three or four years.

The exercise price for stock options granted may not be less than the fair value of common shares as determined by the board of directors as of the date of grant. The Company's board of directors values the Company's common stock, taking into consideration its most recently available valuation of common stock performed by third parties as well as additional factors which may have changed since the date of the most recent contemporaneous valuation through the date of grant.

The total number of shares of common stock that may be issued under the 2016 Plan was 10,377,440 shares as of December 31, 2017, of which 4,538,087 shares remained available for future grant as of December 31, 2017.

Common Stock Option Valuation

The fair value of stock option grants is estimated using the Black-Scholes option-pricing model. The Company historically has been a private company and lacks company-specific historical and implied volatility information. Therefore, the Company estimates its expected stock volatility based on the historical volatility of a publicly traded set of peer companies and expects to continue to do so until such time as it has adequate historical data regarding the volatility of its own traded stock price. For options with service-based vesting conditions, the expected term of the Company's stock options has been determined utilizing the "simplified" method for awards that qualify as "plain-vanilla" options. The expected term of stock options granted to non-employees is equal to the contractual term of the option award. The risk-free interest rate is determined by reference to the U.S. Treasury yield curve in effect at the time of grant of the award for time periods approximately equal to the expected term of the award. Expected dividend yield is based on the fact that the Company has never paid cash dividends and does not expect to pay any cash dividends in the foreseeable future.

The assumptions that the Company used to determine the fair value of options granted to employees and directors were as follows, presented on a weighted average basis:

	Year Ended December 31, 2017
Risk-free interest rate	2.0%
Expected term (in years)	6.0
Expected volatility	78.1%
Expected dividend yield	0%

There were no common stock options granted during the year ended December 31, 2016.

Common Stock Option Activity

The following table summarizes the Company's option activity since December 31, 2016:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding as of December 31, 2016	—	$ —		
Granted	1,613,500	1.87		
Exercised	—	—		
Forfeited	—	—		
Outstanding as of December 31, 2017	1,613,500	$ 1.87	9.8	$ 1,791
Options vested and expected to vest as of December 31, 2017	1,613,500	$ 1.87	9.8	$ 1,791
Options exercisable as of December 31, 2017	25,312	$ 1.87	9.7	$ 28

The aggregate intrinsic value of options is calculated as the difference between the exercise price of the options and the fair value of the Company's common stock for those options that had exercise prices lower than the fair value of the Company's common stock.

The weighted average grant-date fair value per share of options granted during the year ended December 31, 2017 was $1.27.

Restricted Stock Activity

Unvested shares of restricted stock may not be sold or transferred by the holder. These restrictions lapse according to the time-based vesting conditions of each award.

The table below summarizes the Company's restricted stock activity for grants issued under the 2016 Plan:

	Number of Shares	Weighted Average Grant Date Fair Value
Outstanding as of December 31, 2015	—	$ —
Granted	11,310,853	0.32
Vested	(1,998,529)	0.32
Forfeited	—	—
Outstanding as of December 31, 2016	9,312,324	$ 0.32
Granted	565,000	1.87
Vested	(2,582,048)	0.32
Forfeited	(1,850,000)	0.32
Outstanding as of December 31, 2017	5,445,276	$ 0.48

The total fair value of restricted stock vested during the year ended December 31, 2017 was $1.9 million.

As of December 31, 2016 and 2017, there were 3,905,420 and 1,618,545, respectively, of unvested shares of restricted stock held by non-employees.

Stock-Based Compensation

Stock-based compensation expense was classified in the statements of operations and comprehensive loss as follows (in thousands):

	Year Ended December 31,	
	2016	2017
Research and development expenses	$427	$1,626
General and administrative expenses	235	633
	$662	$2,259

As of December 31, 2017, total unrecognized compensation cost related to the unvested stock-based awards was $8.6 million, which is expected to be recognized over a weighted average period of 2.6 years.

10. Net Loss per Share and Unaudited Pro Forma Net Loss per Share

Net Loss per Share

Basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Year Ended December 31,	
	2016	2017
Numerator:		
Net loss	$ (9,431)	$ (35,491)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634
Net loss attributable to common stockholders	$ (9,735)	$ (35,507)
Denominator:		
Weighted average common shares outstanding—basic and diluted	386,083	4,798,213
Net loss per share attributable to common stockholders—basic and diluted	$ (25.21)	$ (7.40)

Common Stock Equivalents

The following common stock equivalents presented based on amounts outstanding at each period end, have been excluded from the calculation of diluted net loss per share because including them would have had an anti-dilutive impact:

	December 31,	
	2016	2017
Redeemable convertible preferred stock (as converted to common stock)	17,718,974	49,178,527
Stock options to purchase common stock	—	1,613,500
Unvested restricted common stock	9,312,324	5,445,276
	27,031,298	56,237,303

Unaudited Pro Forma Net Loss per Share

The unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2017 gives effect to adjustments arising upon the closing of the proposed initial public offering. The unaudited pro forma net loss attributable to common stockholders used in the calculation of unaudited basic and diluted pro forma net loss per share attributable to common stockholders does not include the effects of the accretion on redeemable convertible preferred stock, because it assumes that the conversion of redeemable convertible preferred stock into common stock had occurred on the later of January 1, 2017 or the issuance date of the redeemable convertible preferred stock.

The unaudited pro forma basic and diluted weighted average common shares outstanding used in the calculation of unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2017 gives effect to the automatic conversion upon the closing of the proposed initial public offering of all outstanding shares of redeemable convertible preferred stock as of December 31, 2017 into 49,178,527 shares of common stock as if the conversion had occurred on the later of January 1, 2017 or the issuance date of the redeemable convertible preferred stock.

Unaudited pro forma basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Year Ended December 31, 2017 (unaudited)
Numerator:	
Net loss attributable to common stockholders	$ (35,507)
Accretion of redeemable convertible preferred stock to redemption value	213
Cumulative dividends on redeemable convertible preferred stock	437
Reversal of cumulative dividends on redeemable convertible preferred stock	(634)
Pro forma net loss attributable to common stockholders	$ (35,491)
Denominator:	
Weighted average common shares outstanding—basic and diluted	4,798,213
Pro forma adjustment to reflect assumed automatic conversion of redeemable convertible preferred shares upon the closing of the proposed initial public offering	39,496,161
Pro forma weighted average common shares outstanding—basic and diluted	44,294,374
Pro forma net loss per share attributable to common shareholders —basic and diluted	$ (0.80)

11. Commitments and Contingencies

Leases

The Company entered into an eighteen-month sublease for office space in Cambridge, Massachusetts that began in February 2017 and expires in August 2018. The Company is required to maintain a cash balance of $0.2 million to secure a letter of credit associated with the lease. This amount was classified as restricted cash in the balance sheet at December 31, 2017. Prior to the current lease, the Company leased office space in Cambridge, Massachusetts on a month-to-month basis for which the Company was required to maintain a cash balance of less than $0.1 million to secure a letter of credit for the benefit of the landlord. This amount was classified as restricted cash in the balance sheet at December 31, 2016.

The Company recorded rent expense of less than $0.1 million and $1.1 million during the years ended December 31, 2016 and 2017, respectively.

As of December 31, 2017, the Company has future minimum lease payments due under the operating lease of $0.6 million to be paid in 2018.

Intellectual Property Licenses

In November 2016, the Company entered into a license agreement with the President and Fellows of Harvard College (“Harvard”) for an exclusive, worldwide, royalty-bearing license for certain technologies related to conditioning and mobilization. In consideration for these rights the Company paid Harvard an upfront fee of $0.1 million and reimbursed Harvard $0.3 million for costs incurred by Harvard related to the patented technology, which amounts were recorded as research and development expense during the year ended December 31, 2016. The Company also issued 995,000 shares of common stock in connection with the license agreement. The fair value of the shares of $0.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2016. The Company is obligated to pay Harvard maintenance fees of less than $0.1 million annually through 2019 and $0.1 million annually thereafter and to reimburse qualified expenses related to the patents. The Company is also obligated to pay milestone payments of up to $7.4 million for the first two licensed products upon the achievement of certain development and regulatory milestones and to pay royalties on a product-by-product and country-by-country basis on net sales of products licensed under the agreement.

In April 2017, the Company entered into a license agreement with Novartis to use and develop certain patent rights (the "Novartis License"). Under the Novartis License the Company was granted an exclusive, worldwide, sublicensable license to research, develop and commercialize certain licensed products that contain Novartis compounds for the expansion of cord blood derived non-gene-edited/-modified hematopoietic stem cells. In consideration for these rights, the Company issued 2,500,000 shares of Series A Preferred Stock and 643,550 shares of Series B Preferred Stock to Novartis. The total fair value of the shares of $9.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2017. The Company is obligated to make payments of up to $177.0 million upon the achievement of specified clinical and regulatory milestones and up to $125.0 million upon the achievement of specified commercial milestones and to pay tiered royalties, on a product-by-product and country-by-country basis, on net sales of products licensed under the agreement.

The Company has agreements with third parties in the normal course of business under which it can license certain developed technologies. If the Company exercises its rights to license the respective technologies it may be subject to additional fees and milestone payments. As of December 31, 2017, the Company has not exercised its rights to license such technologies.

Indemnification Agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and senior management that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material costs as a result of such indemnifications. The Company is not aware of any claims under indemnification arrangements, and it has not accrued any liabilities related to such obligations in its financial statements as of December 31, 2016 or 2017.

Legal Proceedings

The Company is not currently a party to any material legal proceedings. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company expenses the costs related to its legal proceedings as they are incurred.

12. 401(k) Savings Plan

The Company has a 401(k) available for participating employees who meet certain eligibility requirements. Eligible employees may defer a portion of their salary as defined by the plan. Company contributions to the plan may be made at the discretion of the Board of Directors of the Company. To date, the Company has not made any contributions to the plan.

13. Income Taxes

2017 U.S. Tax Reform

On December 22, 2017, the Tax Cuts and Jobs Act (the "TCJA") was signed into United States law. The TCJA includes a number of changes to existing tax law, including, among other things, a permanent reduction in the federal corporate income tax rate from 35% to 21%, effective as of January 1, 2018, as well as limitation of the deduction for net operating losses to 80% of annual taxable income and elimination of net operating loss

carrybacks, in each case, for losses arising in taxable years beginning after December 31, 2017 (though any such net operating losses may be carried forward indefinitely). The tax rate change resulted in (i) a reduction in the gross amount of the Company's deferred tax assets recorded as of December 31, 2017, without an impact on the net amount of its deferred tax assets, which are recorded with a full valuation allowance, and (ii) no income tax expense or benefit being recognized as of the enactment date of the TCJA.

The staff of the Securities and Exchange Commission issued Staff Accounting Bulletin No. 118 to address the application of GAAP in situations when a registrant does not have the necessary information available, prepared or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the TCJA. In connection with the initial analysis of the impact of the TCJA, the Company remeasured its deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future, which is generally 21% for federal tax purposes. The remeasurement of the Company's deferred tax assets and liabilities resulted in a provision of $4.8 million to income tax expense which was offset by a corresponding decrease in the valuation allowance.

During the years ended December 31, 2016 and 2017, the Company recorded no income tax benefits for the net operating losses incurred or for the research and development tax credits generated in each year, due to its uncertainty of realizing a benefit from those items.

A reconciliation of the U.S. federal statutory income tax rate to the Company's effective income tax rate is as follows:

	Year Ended December 31,	
	2016	2017
Federal statutory income tax rate	34.0%	34.0%
State taxes, net of federal benefit	4.6	4.9
Federal research and development tax credit	1.8	3.4
Impact of 2018 tax rate change on temporary differences	—	(13.4)
Other	(4.2)	(3.7)
Increase in deferred tax asset valuation allowance	(36.2)	(25.2)
Effective income tax rate	— %	— %

Net deferred tax assets as of December 31, 2016 and 2017 consisted of the following (in thousands):

	December 31,	
	2016	2017
Deferred tax assets:		
Net operating loss carryforwards	$ 3,072	$ 5,158
Intangible assets	33	5,925
Research and development tax credit carryforwards	183	1,400
Other	261	29
Total deferred tax assets	3,549	12,512
Valuation allowance	(3,540)	(12,466)
Net deferred tax assets	9	46
Deferred tax liabilities:		
Depreciation and amortization	(9)	(46)
Total deferred tax liabilities	(9)	(46)
Net deferred tax assets and liabilities	$ —	$ —

As of December 31, 2017, the Company had net operating loss carryforwards for federal and state income tax purposes of $18.7 million and $19.3 million, respectively, which begin to expire in 2035. As of December 31, 2017, the Company also had available research and development tax credit carryforwards for federal and state income tax purposes of $1.0 million and $0.4 million, respectively, which begin to expire in 2035 and 2030, respectively. Utilization of the net operating loss carryforwards and research and development tax credit carryforwards may be subject to a substantial annual limitation under Section 382 of the Internal Revenue Code of 1986, as amended (the "Code") due to ownership changes that have occurred previously or that could occur in the future. These ownership changes may limit the amount of carryforwards that can be utilized annually to offset future taxable income. The Company has not conducted a formal study to assess whether a change of control has occurred or whether there have been multiple changes of control since inception due to the significant complexity and cost associated with such a study. If the Company has experienced a change of control, as defined by Section 382 and 383 of the Code, at any time since inception, utilization of the net operating loss carryforwards or research and development tax credit carryforwards may be subject to an annual limitation under Section 382 and 383 of the Code, which is determined by first multiplying the value of the Company's stock at the time of the ownership change by the applicable long-term tax-exempt rate, and then could be subject to additional adjustments, as required. Any limitation may result in expiration of a portion of the net operating loss carryforwards or research and development tax credit carryforwards before utilization.

The Company has evaluated the positive and negative evidence bearing upon its ability to realize the deferred tax assets. The Company considered its history of cumulative net losses incurred since inception and its lack of commercialization of any products since inception and has concluded that it is more likely than not that the Company will not realize the benefits of the deferred tax assets. Accordingly, a full valuation allowance has been established against the deferred tax assets as of December 31, 2016 and 2017. The Company reevaluates the positive and negative evidence at each reporting period.

Changes in the valuation allowance for deferred tax assets during the years ended December 31, 2016 and 2017 related primarily to the increase in net operating loss carryforwards and research and development tax credit carryforwards, partially offset in 2017 by a decrease in deferred tax assets resulting from the decreased federal corporate tax rate, and were as follows (in thousands):

	Year Ended December 31,	
	2016	2017
Valuation allowance as of beginning of year	$ 129	$ 3,540
Net increases recorded to income tax provision	3,411	8,926
Valuation allowance as of end of year	$3,540	$12,466

The Company has not recorded any amounts for unrecognized tax benefits as of December 31, 2016 or 2017.

The Company files tax returns as prescribed by the tax laws of the jurisdictions in which it operates. In the normal course of business, the Company is subject to examination by federal and state jurisdictions, where applicable. There are currently no pending income tax examinations. The Company's tax years are open under statute from 2015, the inception of the Company, to the present. The Company's policy is to record interest and penalties related to income taxes as part of its income tax provision.

14. Related Parties

Atlas Venture Associates X, LLC and Third Rock Ventures LLC

During the years ended December 31, 2016 and 2017, the Company received consulting, advisory and related services from Atlas Venture Associates X, LLC and Third Rock Ventures LLC, holders of more than 5%

of the Preferred Stock. For the years ended December 31, 2016 and 2017, the Company recorded $1.1 million and $0.2 million, respectively, of general and administrative expenses for management and advisory services and other related services provided by these investors. The Company also issued 250,000 shares of common stock to each investor and recorded $0.2 million of general and administrative expense for the year ended December 31, 2016 related to these shares. As of December 31, 2016, amounts owed to these investors were $0.1 million which were included in accounts payable and accrued expenses. There were no amounts owed as of December 31, 2017.

Novartis

In April 2017, the Company entered into a license agreement with Novartis, a beneficial owner of 5% or more of its outstanding shares of capital stock, to use and develop certain patent rights. In consideration for these rights, the Company issued 2,500,000 shares of Series A Preferred Stock and 643,550 shares of Series B Preferred Stock to Novartis. The fair value of the shares of $9.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2017 (see Note 11).

15. Subsequent Events

For its financial statements as of December 31, 2017 and for the year then ended, the Company evaluated subsequent events through March 28, 2018, the date on which those financial statements were issued.

Collaboration Agreement

In March 2018, the Company entered into a collaboration agreement with Heidelberg Pharma Research GmbH, (“HDPR”) whereby the parties agreed to combine the Company’s stem cell platform with proprietary antibodies across up to four exclusive targets with HDPR’s proprietary Antibody Targeted Amanitin Conjugates platform. Under the agreement, the Company may pay upfront technology access fees, research exclusivity fees and payment for research support. Additionally, upon the exercise of certain license rights, the Company may be obligated to pay HDPR development, regulatory and commercial milestone payments of up to $83.5 million per target as well as royalties on net sales of products licensed under the agreement.

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Common Stock

Preliminary Prospectus

J.P. Morgan **Goldman Sachs & Co. LLC** **Cowen**

Wedbush PacGrow

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. ***Other Expenses of Issuance and Distribution***

The following table sets forth all expenses, other than the underwriting discounts and commissions, payable by Magenta Therapeutics, Inc. (the "Company" or the "Registrant") in connection with the sale of the common stock being registered. All the amounts shown are estimates except the SEC registration fee, the FINRA filing fee and the NASDAQ initial listing fee.

	Amount
SEC registration fee	$ *
FINRA filing fee	*
NASDAQ initial listing fee	*
Blue sky qualification fees and expenses	*
Printing and engraving expenses	*
Legal fees and expenses	*
Accounting fees and expenses	*
Transfer agent and registrar fees	*
Miscellaneous	*
Total	$ *

* To be filed by amendment.

Item 14. ***Indemnification of Directors and Officers***

Section 145 of the Delaware General Corporation Law permits a corporation to include in its charter documents, and in agreements between the corporation and its directors and officers, provisions expanding the scope of indemnification beyond that specifically provided by the current law.

Section 145(a) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation), because he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding, if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful.

Section 145(b) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor because the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made with respect to any claim, issue or matter as to which he or she shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, he or she

is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or other adjudicating court shall deem proper.

Section 145(g) of the Delaware General Corporation Law provides, in general, that a corporation may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his or her status as such, whether or not the corporation would have the power to indemnify the person against such liability under Section 145 of the Delaware General Corporation Law.

The Company's amended and restated certificate of incorporation, which will become effective upon completion of the offering, provides for the indemnification of directors to the fullest extent permissible under Delaware law.

The Company's amended and restated bylaws, which will become effective upon completion of the offering, provide for the indemnification of officers, directors and third parties acting on the Company's behalf if such persons act in good faith and in a manner reasonably believed to be in and not opposed to the Company's best interest, and, with respect to any criminal action or proceeding, such indemnified party had no reason to believe his or her conduct was unlawful.

The Company is entering into indemnification agreements with each of its directors and executive officers, in addition to the indemnification provisions provided for in its charter documents, and the Company intends to enter into indemnification agreements with any new directors and executive officers in the future. These agreements will provide that we will indemnify each of our directors and executive officers, and such entities to the fullest extent permitted by law.

The underwriting agreement (to be filed as Exhibit 1.1 hereto) will provide for indemnification by the underwriters of the Company, and its executive officers and directors, and indemnification of the underwriters by the Company for certain liabilities, including liabilities arising under the Securities Act of 1933, as amended, in connection with matters specifically provided in writing by the underwriters for inclusion in the registration statement.

The Company intends to purchase and maintain insurance on behalf of any person who is or was a director or officer against any loss arising from any claim asserted against him or her and incurred by him or her in that capacity, subject to certain exclusions and limits of the amount of coverage.

Item 15. ***Recent Sales of Unregistered Securities***

In the three years preceding the filing of this registration statement, we have issued the following securities that were not registered under the Securities Act:

Issuances of Capital Stock

In February 2016, we issued and sold an aggregate of 5,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $5.00 to Third Rock Ventures III, L.P., or TRV III, and 5,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $5.00 to Atlas Venture Fund X, L.P., or Atlas X.

In November 2016, we issued and sold an aggregate of 245,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $245.00 to TRV III and 245,000 shares of our common stock at a purchase price of $0.001 per share, for an aggregate purchase price of $245.00 to Atlas X.

In November and December 2016, we issued and sold an aggregate of 11,310,853 shares of our restricted common stock at $0.001 per share to certain of our directors and employees. In March 2017, we issued and sold an aggregate of 565,000 shares of our restricted common stock at $0.01 per share to certain of our employees.

In November 2016, with a subsequent closing in April 2017, we issued and sold an aggregate of 33,163,974 shares of Series A preferred stock at a purchase price of $1.00 per share. Certain investors holding convertible notes issued in 2015 and 2016 used such notes to purchase our Series A preferred stock. Each share of our Series A preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering.

In November 2016, in connection with the Harvard License, we granted 995,000 shares of common stock to Harvard and its affiliates Children's Medical Center Corporation and The General Hospital Corporation at a purchase price of $0.001 per share.

In April 2017, with a subsequent closing in June 2017, we issued and sold an aggregate of 12,871,003 shares of Series B preferred stock at a purchase price of $3.8847 per share. Each share of our Series B preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering.

In April 2017, in connection with the Novartis License, we issued 2,500,000 shares of our Series A preferred stock and 643,550 shares of our Series B preferred stock to Novartis as partial consideration of Novartis' obligations under the Novartis License.

No underwriters were used in the foregoing transactions. All sales of securities described above were made in reliance upon the exemption from registration provided by Section 4(a)(2) of the Securities Act (and/or Regulation D promulgated thereunder) for transactions by an issuer not involving a public offering. All of the foregoing securities are deemed restricted securities for the purposes of the Securities Act.

Grants of Stock Options and Restricted Stock under the 2016 Plan.

From September 28, 2017 through February 28, 2018, we have granted stock options to purchase an aggregate of 3,583,000 shares of our common stock, with exercise prices ranging from $1.87 to $2.98 per share, to employees, directors and consultants pursuant to the 2016 Plan. From November 1, 2016 through March 31, 2017, we have granted an aggregate of 4,575,853 shares of restricted stock under the 2016 Plan. The issuances of these securities were exempt either pursuant to Rule 701, as a transaction pursuant to a compensatory benefit plan, or pursuant to Section 4(a)(2), as a transaction by an issuer not involving a public offering.

Item 16. ***Exhibits and Financial Statement Schedules***

(a) Exhibits.

The exhibits to the registration statement are listed in the Exhibit Index to this registration statement and are incorporated herein by reference.

(b) Financial Statement Schedules.

None.

Item 17. ***Undertakings***

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended, may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the

event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes that:

(a) The undersigned Registrant will provide to the underwriters at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

(b) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(c) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

EXHIBIT INDEX

Exhibit No.	Description
1.1*	Form of Underwriting Agreement
3.1	Second Amended and Restated Certificate of Incorporation of the Registrant, as currently in effect
3.2*	Form of Amended and Restated Certificate of Incorporation of the Registrant, to be in effect upon completion of the offering
3.3	Bylaws of the Registrant and the amendments thereto, as currently in effect
3.4*	Form of Amended and Restated Bylaws of the Registrant, to be in effect upon completion of the offering
4.1*	Specimen Common Stock Certificate
4.2	Amended and Restated Investors' Rights Agreement by and among the Registrant and certain of its stockholders dated April 21, 2017
5.1*	Opinion of Goodwin Procter LLP
10.1#	2016 Stock Option and Grant Plan, as amended, and forms of award agreements thereunder
10.2#*	2018 Stock Option and Incentive Plan and forms of award agreements thereunder
10.3#*	Senior Executive Cash Incentive Bonus Plan
10.4#*	Employee Stock Purchase Plan
10.5#*	Form of Indemnification Agreement
10.6†	License Agreement by and between President and Fellows of Harvard College and the Registrant, dated as of November 2, 2016

10.7†	License Agreement by and between Novartis International Pharmaceutical Ltd. and the Registrant, dated as of April 3, 2017
10.8†	Collaboration Agreement by and between Be The Match BioTherapies and the Registrant, dated as of November 10, 2017
10.9†	Clinical Trial Agreement by and between Regents of the University of Minnesota and the Registrant, dated as of January 22, 2018
10.10†	Master Development and Manufacturing Agreement by and between Bachem Americas, Inc. and the Registrant, dated as of February 13, 2018
10.11†	Exclusive Research, Development Option and License Agreement by and between Heidelberg Pharma Research GmbH and the Registrant, dated as of March 1, 2018
10.12	Sublease Agreement, dated as of September 15, 2016, by and between the Registrant and Surface Oncology, Inc.
23.1*	Consent of KPMG LLP, Independent Registered Public Accounting Firm
23.2*	Consent of Goodwin Procter LLP (included in Exhibit 5.1)
24.1	Power of Attorney (included on signature page)

* To be filed by amendment.
† Application has been made to the Securities and Exchange Commission for confidential treatment of certain provisions. Omitted material for which confidential treatment has been requested has been filed separately with the Securities and Exchange Commission.
# Represents management compensation plan, contract or arrangement.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Massachusetts, on the day of , 2018.

MAGENTA THERAPEUTICS, INC.

By: _____
Jason Gardner, D.Phil.
President, Chief Executive Officer and Director

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Jason Gardner and Zoran Zdraveski and each of them, with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney in fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this Registration Statement, including any and all post effective amendments and amendments thereto, and any registration statement relating to the same offering as this Registration Statement that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys in fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys in fact and agents or any of them or their or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities and on the date indicated.

Signature	Title	Date
JASON GARDNER, D.Phil.	President, Chief Executive Officer and Director (Principal Executive Officer)	
CINDY DRISCOLL	Vice President, Finance (Principal Financial Officer)	
JEFFREY ALBERS	Director	
MICHAEL W. BONNEY	Director	
BRUCE BOOTH, D.Phil.	Director	
ALEXIS A. BORISY	Director	
BLAKE BYERS, Ph.D.	Director	
THOMAS O. DANIEL, M.D.	Director	
AMY L. RONNEBERG	Director	
DAVID T. SCADDEN, M.D.	Director	

Exhibit 3.1

SECOND AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
MAGENTA THERAPEUTICS, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

Magenta Therapeutics, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "**General Corporation Law**"),

DOES HEREBY CERTIFY:

1. That the name of this corporation is Magenta Therapeutics, Inc., and that this corporation was originally incorporated pursuant to the General Corporation Law on June 17, 2015 under the name HSCTCo Therapeutics, Inc. The name of this corporation was changed on February 16, 2016 to Magenta Therapeutics, Inc. The corporation's certificate of incorporation was amended by that certain certificate of amendment dated as of February 16, 2016, was further amended by that certain certificate of amendment dated as of November 1, 2016 and was further amended by that certain Amended and Restated Certificate of Incorporation dated as of November 10, 2016.

2. That the Board of Directors duly adopted resolutions proposing to amend and restate the Amended and Restated Certificate of Incorporation of this corporation, as amended, declaring said amendment and restatement to be advisable and in the best interests of this corporation and its stockholders, and authorizing the appropriate officers of this corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment and restatement is as follows:

RESOLVED, that the Amended and Restated Certificate of Incorporation of this corporation, as amended, be amended and restated in its entirety to read as follows:

FIRST: The name of this corporation is Magenta Therapeutics, Inc. (the "**Corporation**")

SECOND: The address of the registered office of the Corporation in the State of Delaware is Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, New Castle County, Delaware 19801. The name of its registered agent at such address is The Corporation Trust Company.

THIRD: The nature of the business or purposes to be conducted or promoted is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law.

FOURTH: (i) The total number of shares of all classes of stock which the Corporation shall have authority to issue is 70,000,000 shares of Common Stock, $0.001 par value per share ("**Common Stock**") and 49,178,527 shares of Preferred Stock, $0.001 par value per share ("**Preferred Stock**").

The following is a statement of the designations and the powers, privileges and rights, and the qualifications, limitations or restrictions thereof in respect of each class of capital stock of the Corporation.

A. COMMON STOCK

1. General. The voting, dividend and liquidation rights of the holders of the Common Stock are subject to and qualified by the rights, powers and preferences of the holders of the Preferred Stock set forth herein.

2. Voting. The holders of the Common Stock are entitled to one vote for each share of Common Stock held at all meetings of stockholders (and written actions in lieu of meetings); provided, however, that, except as otherwise required by law, holders of Common Stock, as such, shall not be entitled to vote on any amendment to the Corporation's Certificate of Incorporation (the "**Certificate of Incorporation**") that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together with the holders of one or more other such series, to vote thereon pursuant to the Certificate of Incorporation or pursuant to the General Corporation Law. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by (in addition to any vote of the holders of one or more series of Preferred Stock that may be required by the terms of the Certificate of Incorporation) the affirmative vote of the holders of shares of capital stock of the Corporation representing a majority of the votes represented by all outstanding shares of capital stock of the Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law.

B. PREFERRED STOCK

Preferred Stock may be issued from time to time in one or more series, each of such series to consist of such number of shares and to have such terms, rights, powers and preferences, and the qualifications and limitations with respect thereto, as stated or expressed herein.

35,663,974 shares of the authorized Preferred Stock of the Corporation are hereby designated "**Series A Preferred Stock**" and 13,514,553 shares of the authorized Preferred Stock are hereby designated "**Series B Preferred Stock**", with the following rights, preferences, powers, privileges and restrictions, qualifications and limitations. Unless otherwise indicated, references to "Sections" and "Subsections" in this Part B of this Article Fourth refer to sections and subsections of Part B of this Article Fourth.

1. Dividends.

1.1 The Corporation shall not declare, pay or set aside any dividends on shares of any class or series of capital stock of the Corporation (other than dividends on shares of Common Stock payable in shares of Common Stock) unless (in addition to the obtaining of any consents required elsewhere in the Certificate of Incorporation) the holders of the Preferred Stock then outstanding shall first receive, or simultaneously receive, a dividend on each outstanding share of Preferred Stock in an amount at least equal to (i) in the case of a dividend on Common Stock or any class or series that is convertible into Common Stock, the product of (1) the amount of the dividend payable on each share of such class or series determined, if applicable, as if all shares of such class or series had been converted into Common Stock and (2) the number of shares of Common Stock issuable upon conversion of such share of Preferred Stock, in each case calculated on the record date for determination of holders entitled to receive such dividend or (ii) in the case of a dividend on any class or series that is not convertible into Common Stock, the amount determined by (1) dividing the amount of the dividend payable on each share of such class or series of capital stock by the original issuance price per share of such class or series of capital stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to such class or series) and (2) multiplying such fraction by the Applicable Preferred Stock Original Issue Price (as defined below); provided that, if the Corporation declares, pays or sets aside, on the same date, a dividend on shares of more than one class or series of capital stock of the Corporation, the dividend payable to the holders of Preferred Stock pursuant to this clause (a) shall be calculated (separately for holders of the Series A Preferred Stock and the Series B Preferred Stock) based upon the dividend on the class or series of capital stock that would result in the highest dividend to such holders of Preferred Stock.

1.2 For purposes hereof, the "**Applicable Preferred Stock Original Issue Price**" shall mean (a) in the case of the Series A Preferred Stock, $1.00 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A Preferred Stock and (b) in the case of the Series B Preferred Stock, $3.8847 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B Preferred Stock (the "**Series B Original Issue Price**").

2. Liquidation, Dissolution or Winding Up; Certain Mergers, Consolidations and Asset Sales.

2.1 Preferential Payments to Holders of Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event (as defined below), the holders of shares of Preferred Stock then outstanding shall be entitled, on a pari passu basis, to be paid out of the assets of the Corporation available for distribution to its stockholders before any payment shall be made to the holders of Common Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) the Applicable Preferred Stock Original Issue Price, plus any dividends declared but unpaid thereon, or (ii) such amount as would have been payable in respect of such share had all shares of such series of Preferred Stock been converted into Common Stock pursuant to Section 4 immediately prior to such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall

be insufficient to pay the holders of shares of Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1, the holders of shares of Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full. The amount which a holder of a share of any series of Preferred Stock is entitled to receive under the first sentence of this Subsection 2.1 is hereinafter referred to as the "**Applicable Preferred Stock Liquidation Amount**" with respect to such share.

2.2 Distribution of Remaining Assets. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, after the payment of all preferential amounts required to be paid to the holders of shares of Preferred Stock, the remaining assets of the Corporation available for distribution to its stockholders shall be distributed among the holders of the shares of Common Stock, pro rata based on the number of shares held by each such holder.

2.3 Deemed Liquidation Events.

2.3.1 Definition. Each of the following events shall be considered a "**Deemed Liquidation Event**" unless (a) the holders of a majority of the then outstanding shares of Preferred Stock, voting or consenting together as a single class on an as-converted basis (the "**Required Vote**") and (b) solely in the event that any such Deemed Liquidation Event would result in proceeds paid to the holders of shares of Series B Preferred Stock in respect of each share of Series B Preferred Stock of less than one and a half times (1.5x) the Series B Original Issue Price, the holders of a majority of the then outstanding shares of Series B Preferred Stock, voting or consenting separately as a single class (the "**Required Series B Vote**"), elect otherwise by written notice sent to the Corporation at least ten (10) days prior to the effective date of any such event; provided, that the Required Series B Vote shall no longer be required under this Subsection 2.3.1 and shall be of no further force or effect upon the issuance of shares of any new class or series of preferred stock of the Corporation ranking senior to or pari passu with the Series B Preferred Stock with respect to the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends and rights of redemption, in a *bona fide* equity financing resulting in gross proceeds to the Corporation of at least $20,000,000 from investors that do not hold any capital stock or convertible securities of the Corporation prior to such date (the "**Qualified Financing**"):

(a) a merger or consolidation in which

(i) the Corporation is a constituent party or

(ii) a subsidiary of the Corporation is a constituent party and the Corporation issues shares of its capital stock pursuant to such merger or consolidation, except any such merger or consolidation involving the Corporation or a subsidiary in which the shares of capital stock of the Corporation outstanding immediately prior to such merger or consolidation continue to represent, or are converted into or exchanged for shares of capital stock that represent, immediately following such merger or consolidation, at least a majority, by voting power, of the capital stock of (1) the surviving or resulting corporation or (2) if the surviving or resulting corporation is a wholly owned subsidiary of another corporation immediately following such merger or consolidation, the parent corporation of such surviving or resulting corporation; or

(b) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Corporation or any subsidiary of the Corporation of all or substantially all the assets of the Corporation and its subsidiaries taken as a whole or the sale or disposition (whether by merger, consolidation or otherwise) of one or more subsidiaries of the Corporation if substantially all of the assets of the Corporation and its subsidiaries taken as a whole are held by such subsidiary or subsidiaries, except where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned subsidiary of the Corporation.

2.3.2 Effecting a Deemed Liquidation Event; Redemption

(a) The Corporation shall not have the power to effect a Deemed Liquidation Event referred to in Subsection 2.3.1(a)(i) above unless the agreement or plan of merger or consolidation for such transaction (the "**Merger Agreement**") provides that the consideration payable to the stockholders of the Corporation shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 and 2.2 above.

(b) In the event of a Deemed Liquidation Event referred to in Subsection 2.3.1(a)(ii), or 2.3.1(b) above, if the Corporation does not effect a dissolution of the Corporation under the General Corporation Law within ninety (90) days after such Deemed Liquidation Event, then (i) the Corporation shall send a written notice to each holder of Preferred Stock no later than the ninetieth (90th) day after the Deemed Liquidation Event advising such holders of their right (and the requirements to be met to secure such right) pursuant to the terms of the following clause (ii) to require the redemption of such shares of Preferred Stock, and (ii) if the holders representing the Required Vote so request in a written instrument delivered to the Corporation not later than one hundred twenty (120) days after such Deemed Liquidation Event, the Corporation shall use the consideration received by the Corporation for such Deemed Liquidation Event (net of any retained liabilities associated with the assets sold or technology licensed, as determined in good faith by the Corporation's Board of Directors (the "**Board of Directors**") (together with any other assets of the Corporation available for distribution to its stockholders as determined in good faith by the Board of Directors, the "**Net Proceeds**")), including a majority of the Preferred Directors then serving on the Board of Directors, all to the extent permitted by Delaware law governing distributions to stockholders, on the one hundred fiftieth (150th) day after such Deemed Liquidation Event, to redeem all outstanding shares of Preferred Stock at a price per share equal to the Applicable Preferred Stock Liquidation Amount. Notwithstanding the foregoing, in the event of a redemption pursuant to the preceding sentence, if the Net Proceeds are not sufficient to redeem all outstanding shares of Preferred Stock, or if the Corporation does not have sufficient lawfully available funds to effect such redemption, the Corporation shall redeem each holder's shares of Preferred Stock ratably (based on the respective amounts that each holder would have received if all outstanding shares of Preferred Stock were redeemed as provided in clause (ii) above) to the fullest extent of such Net Proceeds or such lawfully available funds, as the case may be, and shall redeem the remaining shares ratably (in the same manner) as soon as it may lawfully do so under Delaware law governing

distributions to stockholders. The provisions of Subsections 2.3.2(c)(i) through 2.3.2(c)(iv) below shall apply, with such necessary changes in the details thereof as are necessitated by the context, to the redemption of the Preferred Stock pursuant to this Subsection 2.3.2(b). Prior to the distribution or redemption provided for in this Subsection 2.3.2(b), the Corporation shall not expend or dissipate the consideration received for such Deemed Liquidation Event, except to discharge expenses incurred in connection with such Deemed Liquidation Event or in the ordinary course of business.

(c) The holders of the Preferred Stock shall have redemption rights as follows:

(i) Shares of Preferred Stock shall be redeemed by the Corporation at a price equal to the Applicable Preferred Stock Original Issue Price, plus any dividend declared but unpaid thereon (the "**Redemption Price**") in three (3) annual installments commencing not more than sixty (60) days after receipt by the Corporation at any time on or after April 21, 2022, from the holders representing the Required Vote, of written notice requesting redemption of all shares of Preferred Stock (the "**Redemption Request**"). Upon receipt of a Redemption Request, the Corporation shall apply all of its assets to any such redemption, and to no other corporate purpose, except to the extent prohibited by Delaware law governing distributions to stockholders. The date of each such installment shall be referred to as a "**Redemption Date.**" On each Redemption Date, the Corporation shall redeem, each holder's shares of Preferred Stock ratably (based on the respective amounts that each holder would have received if all outstanding shares of Preferred Stock were redeemed on such Redemption Date) to the extent of an aggregate Redemption Price determined by dividing (i) the aggregate Redemption Price of all shares of Preferred Stock outstanding immediately prior to such Redemption Date by (ii) the number of remaining Redemption Dates (including the Redemption Date to which such calculation applies). If on any Redemption Date Delaware law governing distributions to stockholders prevents the Corporation from redeeming all shares of Preferred Stock to be redeemed, the Corporation shall redeem the maximum number of shares that it may redeem consistent with such law ratably (based on the respective amounts that each holder would have received if all shares of Preferred Stock to be redeemed on such Redemption Date were redeemed), and shall redeem the remaining shares ratably (in the same manner) as soon as it may lawfully do so under such law.

(ii) On or before any Redemption Date, each holder of shares of Preferred Stock to be redeemed on such Redemption Date, unless such holder has exercised his, her or its right to convert such shares as provided in Section 4, shall surrender the certificate or certificates representing such shares (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate) to the Corporation, and thereupon the Redemption Price for such shares shall be payable to the order of the person whose name appears on such certificate or certificates as the owner thereof.

(iii) If on the applicable Redemption Date the Redemption Price payable upon redemption of the shares of Preferred Stock to be redeemed on such Redemption Date is paid or tendered for payment or deposited with an independent payment agent so as to be available therefor, then notwithstanding that the certificates evidencing any of the shares of Preferred Stock so called for redemption shall not have been surrendered, all rights with respect to such shares shall forthwith after the Redemption Date terminate, except only the right of the holders to receive the Redemption Price without interest upon surrender of their certificate or certificates therefor.

(iv) Any shares of Preferred Stock that are redeemed or otherwise acquired by the Corporation or any of its subsidiaries shall be automatically and immediately cancelled and retired and shall not be reissued, sold or transferred. Neither the Corporation nor any of its subsidiaries may exercise any voting or other rights granted to the holders of Preferred Stock following redemption.

2.3.3 Amount Deemed Paid or Distributed. If the amount deemed paid or distributed under this Subsection 2.3 is made in property other than in cash, the value of such payment or distribution shall be the fair market value of such property, determined as follows:

(a) For securities not subject to investment letters or other similar restrictions on free marketability,

(i) if traded on a securities exchange, the value shall be deemed to be the average of the closing prices of the securities on such exchange or market over the 30-period ending three (3) days prior to the closing of such transaction;

(ii) if actively traded over-the-counter, the value shall be deemed to be the average of the closing bid prices over the 30-day period ending three (3) days prior to the closing of such transaction; or

(iii) if there is no active public market, the value shall be the fair market value thereof, as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

(b) The method of valuation of securities subject to investment letters or other similar restrictions on free marketability (other than restrictions arising solely by virtue of a stockholder's status as an affiliate or former affiliate) shall take into account an appropriate discount (as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors) from the market value as determined pursuant to clause (a) above so as to reflect the approximate fair market value thereof.

(c) For any property not addressed by Subsection 2.3.3(a) or Subsection 2.3.3(b), the value of such property shall be determined in good faith by the Board of Directors of the Corporation, including all Preferred Directors (as defined below) then serving on the Board of Directors.

2.3.4 Allocation of Escrow or Contingent Payments. In the event of a Deemed Liquidation Event pursuant to Subsection 2.3.1(a)(i), if any portion of the consideration payable to the stockholders of the Corporation is payable only upon satisfaction of contingencies (the "**Additional Consideration**"), the Merger Agreement shall provide that (a) the portion of such consideration that is not Additional Consideration (such portion, the "**Initial Consideration**") shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 and 2.2 as if the Initial Consideration were the only consideration payable in connection with such Deemed Liquidation Event and (b) any Additional Consideration which becomes payable to the stockholders of the Corporation upon satisfaction of such contingencies shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 and 2.2 after taking into account the previous payment of the Initial Consideration as part of the same transaction. For the purposes of this Subsection 2.3.4, consideration placed into escrow or retained as holdback to be available for satisfaction of indemnification or similar obligations or otherwise subject to contingencies in connection with such Deemed Liquidation Event shall be deemed to be Additional Consideration.

3. Voting.

3.1 General. On any matter presented to the stockholders of the Corporation for their action or consideration at any meeting of stockholders of the Corporation (or by written consent of stockholders in lieu of a meeting), each holder of outstanding shares of Preferred Stock shall be entitled to cast the number of votes equal to the number of whole shares of Common Stock into which the shares of Preferred Stock held by such holder are convertible as of the record date for determining stockholders entitled to vote on such matter. Except as provided by law or by the other provisions of the Certificate of Incorporation, holders of Preferred Stock shall vote together with the holders of Common Stock as a single class, on an as-converted basis.

3.2 Election of Directors. The holders of record of the shares of Series A Preferred Stock, exclusively and as a separate class, shall be entitled to elect two (2) directors of the Corporation. The directors to be elected pursuant to the first sentence of this Subsection 3.2 shall be referred to herein as the "**Series A Directors.**" Any Series A Director may be removed without cause by, and only by, the affirmative vote of the holders of the shares of the class or series of capital stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or by a written consent of stockholders in lieu of a meeting. The holders of record of the shares of Series B Preferred Stock, exclusively and as a separate class, shall be entitled to elect one (1) director of the Corporation. The director to be elected pursuant to the fourth sentence of this Subsection 3.2 shall be referred to herein as the "**Series B Director**" (and together with the Series A Directors, the "**Preferred Directors**"). The Series B Director may be removed without cause by, and only by, the affirmative vote of the holders of the shares of the class or series of capital stock entitled to elect such director, given either at a special meeting of such stockholders duly called for that purpose or by a written consent of stockholders in lieu of a meeting. The holders of record of the shares of Common Stock and of any other class or series of voting stock (including the Preferred Stock), exclusively and voting together as a single class on an as converted basis, shall be entitled to elect the balance of the total number of directors of the Corporation. At any meeting held for the purpose of electing a director, the presence in person or by proxy of the holders of a majority of the outstanding shares of the class or series entitled to elect such director shall constitute a quorum for the purpose of electing such director. A vacancy in any directorship filled by the holders of any class or series shall be filled only by vote or written consent in lieu of a meeting of the holders of such class or series or by any remaining director or directors elected by the holders of such class or series pursuant to this Subsection 3.2.

3.3 Preferred Stock Protective Provisions. At any time when any shares of Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders representing the Required Vote, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) liquidate, dissolve or wind-up the business and affairs of the Corporation, effect any merger, acquisition or consolidation or any other Deemed Liquidation Event, or consent to any of the foregoing;

(b) amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws of the Corporation;

(c) create or authorize the creation of or issue or obligate itself to issue shares of any other security convertible into or exercisable for any equity security or increase the authorized number of shares of Series A Preferred Stock or the Series B Preferred Stock or of any additional class or series of capital stock unless it ranks junior to the Series A Preferred Stock and the Series B Preferred Stock;

(d) reclassify, alter or amend any existing security that is junior to or on parity with the Series A Preferred Stock or the Series B Preferred Stock, if such reclassification, alteration or amendment would render such other security senior to or on parity with the Series A Preferred Stock or the Series B Preferred Stock;

(e) purchase or redeem or pay or declare any dividend, or make any distribution on any shares of capital stock prior to the Preferred Stock, other than Common Stock repurchased from former employees or consultants in connection with the cessation of their employment/services, pursuant to the provisions of existing plans or agreements;

(f) increase or decrease the authorized number of directors constituting the Board of Directors;

(g) create or hold capital stock in any subsidiary that is not a wholly-owned subsidiary of the Corporation or dispose of any subsidiary stock or all or substantially all of any subsidiary assets; or

(h) sell, assign, license, pledge or encumber material technology or intellectual property, other than licenses granted in the ordinary course of business.

3.4 Series B Preferred Stock Protective Provisions. At any time when any shares of Series B Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of holders representing the Required Series B Vote, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) amend, alter or repeal any provision of the Certificate of Incorporation of the Corporation in a manner that adversely affects the powers, preferences or rights of the Series B Preferred Stock (provided that the creation or issuance of a new series of preferred stock pari passu with or senior to the Series B Preferred Stock with correlative amendments to the terms of the Corporation's Certificate of Incorporation shall not in and of itself trigger such provision);

(b) purchase or redeem or pay or declare any dividend or make any distribution on, any shares of capital stock of the Corporation prior to the Series B Preferred Stock other than repurchases of stock from former employees, officers, directors, consultants or other persons who performed services for the Corporation or any subsidiary in connection with the cessation of such employment or service at the lower of the original purchase price or the then-current fair market value thereof;

(c) increase or decrease the authorized number of shares of Series B Preferred Stock; or

(d) approve or effect any Deemed Liquidation Event that would result in proceeds paid to the holders of shares of Series B Preferred Stock in respect of each share of Series B Preferred Stock of less than one and a half times (1.5x) the Series B Original Issue Price; provided that this Subsection 3.4(d) shall automatically be null and void and of no further force or effect upon consummation of the Qualified Financing.

3.5 Series A Preferred Stock Protective Provisions. At any time when any shares of Series A Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders representing seventy-five percent (75%) the outstanding shares of Series A Preferred Stock (the "**Required Series A Vote**"), given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) amend, alter or repeal any provision of the Certificate of Incorporation of the Corporation in a manner that adversely affects the powers, preferences or rights of the Series A Preferred Stock (provided that the creation or issuance of a new series of preferred stock pari passu with or senior to the Series A Preferred Stock with correlative amendments to the terms of the Corporation's Certificate of Incorporation shall not in and of itself trigger such provision);

(b) purchase or redeem or pay or declare any dividend or make any distribution on, any shares of capital stock of the Corporation prior to the Preferred Stock other than repurchases of stock from former employees, officers, directors, consultants or other persons who performed services for the Corporation or any subsidiary in connection with the cessation of such employment or service at the lower of the original purchase price or the then-current fair market value thereof; or

(c) increase or decrease the authorized number of shares of Series A Preferred Stock.

4. Optional Conversion.

The holders of the Preferred Stock shall have conversion rights as follows (the "**Conversion Rights**"):

4.1 Right to Convert.

4.1.1 Conversion Ratio. Each share of Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Common Stock as is determined by dividing the Applicable Preferred Stock Original Issue Price by the Applicable Preferred Stock Conversion Price (as defined below) in effect at the time of conversion. For purposes hereof, the "**Applicable Preferred Stock Conversion Price**" shall initially be equal to (a) in the case of the Series A Preferred Stock, $1.00 and (b) in the case of the Series B Preferred Stock, $3.8847. Such initial Applicable Preferred Stock Conversion Price, and the rate at which shares of Preferred Stock may be converted into shares of Common Stock, shall be subject to adjustment as provided below.

4.1.2 Termination of Conversion Rights. In the event of a notice of redemption of any shares of Preferred Stock pursuant to Subsection 2.3.2(c), the Conversion Rights of the shares designated for redemption shall terminate at the close of business on the last full day preceding the date fixed for redemption, unless the Redemption Price is not fully paid on such Redemption Date, in which case the Conversion Rights for such shares shall continue until such price is paid in full. In the event of a liquidation, dissolution or winding up of the Corporation or a Deemed Liquidation Event, the Conversion Rights shall terminate at the close of business on the last full day preceding the date fixed for the payment of any amounts distributable on such event to the holders of Preferred Stock.

4.2 Fractional Shares. No fractional shares of Common Stock shall be issued upon conversion of the Preferred Stock. In lieu of any fractional shares to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the fair market value of a share of Common Stock as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

Whether or not fractional shares would be issuable upon such conversion shall be determined on the basis of the total number of shares of Preferred Stock the holder is at the time converting into Common Stock and the aggregate number of shares of Common Stock issuable upon such conversion.

4.3 Mechanics of Conversion.

4.3.1 Notice of Conversion. In order for a holder of Preferred Stock to voluntarily convert shares of Preferred Stock into shares of Common Stock, such holder shall surrender the certificate or certificates for such shares of Preferred Stock (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate), at the office of the transfer agent for the Preferred Stock (or at the principal office of the Corporation if the Corporation serves as its own transfer agent), together with written notice that such holder elects to convert all or any number of the shares of Preferred Stock represented by such certificate or certificates and, if applicable, any event on which such conversion is contingent. Such notice shall state such holder's name or the names of the nominees in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. If required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by a written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or his, her or its attorney duly authorized in writing. The close of business on the date of receipt by the transfer agent (or by the Corporation if the Corporation serves as its own transfer agent) of such certificates (or lost certificate affidavit and agreement) and notice shall be the time of conversion (the "**Conversion Time**"), and the shares of Common Stock issuable upon conversion of the shares represented by such certificate shall be deemed to be outstanding of record as of such date. The Corporation shall, as soon as practicable after the Conversion Time, (i) issue and deliver to such holder of Preferred Stock, or to his, her or its nominees, a certificate or certificates for the number of full shares of Common Stock issuable upon such conversion in accordance with the provisions hereof and, a certificate for the number (if any) of the shares of Preferred Stock represented by the surrendered certificate that were not converted into Common Stock, (ii) pay in cash such amount as provided in Subsection 4.2 in lieu of any fraction of a share of Common Stock otherwise issuable upon such conversion and (iii) pay all declared but unpaid dividends on the shares of Preferred Stock converted.

4.3.2 Reservation of Shares. The Corporation shall at all times when the Preferred Stock shall be outstanding, reserve and keep available out of its authorized but unissued capital stock, for the purpose of effecting the conversion of the Preferred Stock, such number of its duly authorized shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding Preferred Stock; and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Preferred Stock, the Corporation shall take such corporate action as may be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to the Certificate of Incorporation. Before taking any action which would cause an adjustment

reducing the Applicable Preferred Stock Conversion Price below the then par value of the shares of Common Stock issuable upon conversion of the Preferred Stock, the Corporation will take any corporate action which may, in the opinion of its counsel, be necessary in order that the Corporation may validly and legally issue fully paid and nonassessable shares of Common Stock at such adjusted Applicable Preferred Stock Conversion Price.

4.3.3 Effect of Conversion. All shares of Preferred Stock which shall have been surrendered for conversion as herein provided shall no longer be deemed to be outstanding and all rights with respect to such shares shall immediately cease and terminate at the Conversion Time, except only the right of the holders thereof to receive shares of Common Stock in exchange therefor and to receive payment in lieu of any fraction of a share otherwise issuable upon such conversion as provided in Subsection 4.2 and to receive payment of any dividends declared but unpaid thereon. Any shares of Preferred Stock so converted shall be retired and cancelled and may not be reissued as shares of such series, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Preferred Stock accordingly.

4.3.4 No Further Adjustment. Upon any such conversion, no adjustment to the Applicable Preferred Stock Conversion Price shall be made for any declared but unpaid dividends on the Preferred Stock surrendered for conversion or on the Common Stock delivered upon conversion.

4.3.5 Taxes. The Corporation shall pay any and all issue and other similar taxes that may be payable in respect of any issuance or delivery of shares of Common Stock upon conversion of shares of Preferred Stock pursuant to this Section 4. The Corporation shall not, however, be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of shares of Common Stock in a name other than that in which the shares of Preferred Stock so converted were registered, and no such issuance or delivery shall be made unless and until the person or entity requesting such issuance has paid to the Corporation the amount of any such tax or has established, to the satisfaction of the Corporation, that such tax has been paid.

4.4 Adjustments to Applicable Preferred Stock Conversion Price for Diluting Issues.

4.4.1 Special Definitions. For purposes of this Article Fourth, the following definitions shall apply:

(a) "**Option**" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(b) "**Series B Original Issue Date**" shall mean the date on which the first share of Series B Preferred Stock was issued.

(c) "**Convertible Securities**" shall mean any evidences of indebtedness, shares or other securities directly or indirectly convertible into or exchangeable for Common Stock, but excluding Options.

(d) "**Additional Shares of Common Stock**" shall mean all shares of Common Stock issued (or, pursuant to Subsection 4.4.3 below, deemed to be issued) by the Corporation after the Series B Original Issue Date, other than (1) the following shares of Common Stock and (2) shares of Common Stock deemed issued pursuant to the following Options and Convertible Securities (clauses (1) and (2), collectively "**Exempted Securities**"):

(i) shares of Common Stock, Options or Convertible Securities issued as a dividend or distribution on, or upon the conversion of, Preferred Stock, and shares of Common Stock actually issued upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, upon the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security;

(ii) shares of Common Stock, Options or Convertible Securities issued by reason of a dividend, stock split, split-up or other distribution on shares of Common Stock that is covered by Subsections 4.5, 4.6, 4.7 or 4.8 below, and shares of Common Stock actually issued upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security;

(iii) shares of Common Stock or Options issued to employees or directors of, or consultants or advisors to, the Corporation or any of its subsidiaries pursuant to a plan, agreement or arrangement approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and shares of Common Stock actually issued upon the exercise or conversion of such Options, in each case provided such issuance is pursuant to the terms of such Option;

(iv) shares of Common Stock, Options or Convertible Securities issued to banks, equipment lessors or other financial institutions, or to real property lessors, pursuant to a debt financing, equipment leasing or real property leasing transaction approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and shares of Common Stock actually issued upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security; and

(v) shares of Common Stock, Options or Convertible Securities issued in connection with sponsored research, collaboration, technology license, development, OEM, marketing or other similar agreements or strategic partnerships approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and shares of Common Stock issuable upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security.

4.4.2 No Adjustment of Series A Conversion Price. No adjustment in the Series A Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the holders representing the Required Series A Vote, voting as a separate class on an as-converted basis, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

4.4.3 No Adjustment of Series B Conversion Price. No adjustment in the Series B Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the holders representing the Required Series B Vote, voting as a separate class on an as-converted basis, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

4.4.4 Deemed Issue of Additional Shares of Common Stock.

(a) If the Corporation at any time or from time to time after the Series B Original Issue Date shall issue any Options or Convertible Securities (excluding Options or Convertible Securities which are themselves Exempted Securities) or shall fix a record date for the determination of holders of any class of securities entitled to receive any such Options or Convertible Securities, then the maximum number of shares of Common Stock (as set forth in the instrument relating thereto, assuming the satisfaction of any conditions to exercisability, convertibility or exchangeability but without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as of the close of business on such record date.

(b) If the terms of any Option or Convertible Security, the issuance of which resulted in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 below, are revised as a result of an amendment to such terms or if any other adjustment is made pursuant to the provisions of such Option or Convertible Security (but excluding automatic adjustments to such terms pursuant to anti-dilution or similar provisions of such Option or Convertible Security) to provide for either (1) any increase or decrease in the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any such Option or Convertible Security or (2) any increase or decrease in the consideration payable to the Corporation upon such exercise, conversion and/or exchange, then, effective upon such increase or decrease becoming effective, the Applicable Preferred Stock Conversion Price computed upon the original issue of such Option or Convertible Security (or upon the occurrence of a record date with respect thereto) shall be readjusted to such Applicable Preferred Stock Conversion Price as would have been obtained had such revised terms been in effect upon the original date of issuance of such Option or Convertible Security. Notwithstanding the foregoing, no readjustment pursuant to this clause (b) shall have the effect of increasing the Applicable Preferred Stock Conversion Price to an amount which exceeds the lower of (i) the Applicable Preferred Stock Conversion Price in effect immediately prior to the

original adjustment made as a result of the issuance of such Option or Convertible Security, or (ii) the Applicable Preferred Stock Conversion Price that would have resulted from any issuances of Additional Shares of Common Stock (other than deemed issuances of Additional Shares of Common Stock as a result of the issuance of such Option or Convertible Security) between the original adjustment date and such readjustment date.

(c) If the terms of any Option or Convertible Security (excluding Options or Convertible Securities which are themselves Exempted Securities), the issuance of which did not result in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 below (either because the consideration per share (determined pursuant to Subsection 4.4.5 hereof) of the Additional Shares of Common Stock subject thereto was equal to or greater than the Applicable Preferred Stock Conversion Price then in effect, or because such Option or Convertible Security was issued before the Series B Original Issue Date), are revised after the Series B Original Issue Date as a result of an amendment to such terms or any other adjustment pursuant to the provisions of such Option or Convertible Security (but excluding automatic adjustments to such terms pursuant to anti-dilution or similar provisions of such Option or Convertible Security) to provide for either (1) any increase in the number of shares of Common Stock issuable upon the exercise, conversion or exchange of any such Option or Convertible Security or (2) any decrease in the consideration payable to the Corporation upon such exercise, conversion or exchange, then such Option or Convertible Security, as so amended or adjusted, and the Additional Shares of Common Stock subject thereto (determined in the manner provided in Subsection 4.4.3(a) above) shall be deemed to have been issued effective upon such increase or decrease becoming effective.

(d) Upon the expiration or termination of any unexercised Option or unconverted or unexchanged Convertible Security (or portion thereof) which resulted (either upon its original issuance or upon a revision of its terms) in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 below, the Applicable Preferred Stock Conversion Price shall be readjusted to such Applicable Preferred Stock Conversion Price as would have been obtained had such Option or Convertible Security (or portion thereof) never been issued.

(e) If the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any Option or Convertible Security, or the consideration payable to the Corporation upon such exercise, conversion and/or exchange, is calculable at the time such Option or Convertible Security is issued or amended but is subject to adjustment based upon subsequent events, any adjustment to the Applicable Preferred Stock Conversion Price provided for in this Subsection 4.4.3 shall be effected at the time of such issuance or amendment based on such number of shares or amount of consideration without regard to any provisions for subsequent adjustments (and any subsequent adjustments shall be treated as provided in clauses (b) and (c) of this Subsection 4.4.3). If the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any Option or Convertible Security, or the consideration payable to the Corporation upon such exercise, conversion and/or exchange, cannot be calculated at all at the time such Option or Convertible Security is issued or amended, any adjustment to the Applicable Preferred Stock Conversion Price that would result under the terms of this Subsection 4.4.3 at the time of such issuance or amendment shall instead be effected at the time such number of shares and/or amount of consideration is first calculable (even if subject to subsequent adjustments), assuming for purposes of calculating such adjustment to the Applicable Preferred Stock Conversion Price that such issuance or amendment took place at the time such calculation can first be made.

4.4.5 Adjustment of Applicable Preferred Stock Conversion Price Upon Issuance of Additional Shares of Common Stock. In the event the Corporation shall at any time or from time to time after the Series B Original Issue Date issue Additional Shares of Common Stock (including Additional Shares of Common Stock deemed to be issued pursuant to Subsection 4.4.3), without consideration or for a consideration per share less than the Applicable Preferred Stock Conversion Price in effect immediately prior to such issue, then the Applicable Preferred Stock Conversion Price shall be reduced, concurrently with such issue, to a price (calculated to the nearest one-hundredth of a cent) determined in accordance with the following formula:

$$CP_2 = (CP_1 * (A + B)) \div (A + C).$$

For purposes of the foregoing formula, the following definitions shall apply:

(a) "CP_2" shall mean the Applicable Preferred Stock Conversion Price in effect immediately after such issue of Additional Shares of Common Stock;

(b) "CP_1" shall mean the Applicable Preferred Stock Conversion Price in effect immediately prior to such issue of Additional Shares of Common Stock;

(c) "A" shall mean the number of shares of Common Stock outstanding immediately prior to such issue of Additional Shares of Common Stock (treating for this purpose as outstanding all shares of Common Stock issuable upon exercise of Options outstanding immediately prior to such issue or upon conversion or exchange of Convertible Securities (including the Preferred Stock) outstanding (assuming exercise of any outstanding Options therefor) immediately prior to such issue);

(d) "B" shall mean the number of shares of Common Stock that would have been issued if such Additional Shares of Common Stock had been issued at a price per share equal to CP_1 (determined by dividing the aggregate consideration received by the Corporation in respect of such issue by CP_1); and

(e) "C" shall mean the number of such Additional Shares of Common Stock issued in such transaction.

4.4.6 Determination of Consideration. For purposes of this Subsection 4.4, the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(a) Cash and Property: Such consideration shall:

(i) insofar as it consists of cash, be computed at the aggregate amount of cash received by the Corporation, excluding amounts paid or payable for accrued interest;

(ii) insofar as it consists of property other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors; and

(iii) in the event Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received that is attributable to the Additional Shares of Common Stock, computed as provided in clauses (i) and (ii) above, as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

(b) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Subsection 4.4.3, relating to Options and Convertible Securities, shall be determined by dividing

(i) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by

(ii) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities.

4.4.7 Multiple Closing Dates. In the event the Corporation shall issue on more than one date Additional Shares of Common Stock that are a part of one transaction or a series of related transactions and that would result in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 above then, upon the final such issuance, the Applicable Preferred Stock Conversion Price shall be readjusted to give effect to all such issuances as if they occurred on the date of the first such issuance (and without giving effect to any additional adjustments as a result of any such subsequent issuances within such period).

4.5 Adjustment for Stock Splits and Combinations. If the Corporation shall at any time or from time to time after the Series B Original Issue Date effect a subdivision of the outstanding Common Stock, the Applicable Preferred Stock Conversion Price in effect immediately before that subdivision shall be proportionately decreased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be increased in proportion to such increase in the aggregate number of shares of Common Stock outstanding.

If the Corporation shall at any time or from time to time after the Series B Original Issue Date combine the outstanding shares of Common Stock, the Applicable Preferred Stock Conversion Price in effect immediately before the combination shall be proportionately increased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be decreased in proportion to such decrease in the aggregate number of shares of Common Stock outstanding. Any adjustment under this subsection shall become effective at the close of business on the date the subdivision or combination becomes effective.

4.6 Adjustment for Certain Dividends and Distributions. In the event the Corporation at any time or from time to time after the Series B Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable on the Common Stock in additional shares of Common Stock, then and in each such event the Applicable Preferred Stock Conversion Price in effect immediately before such event shall be decreased as of the time of such issuance or, in the event such a record date shall have been fixed, as of the close of business on such record date, by multiplying the Applicable Preferred Stock Conversion Price then in effect by a fraction:

(1) the numerator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date, and

(2) the denominator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date plus the number of shares of Common Stock issuable in payment of such dividend or distribution.

Notwithstanding the foregoing, (a) if such record date shall have been fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, the Applicable Preferred Stock Conversion Price shall be recomputed accordingly as of the close of business on such record date and thereafter the Applicable Preferred Stock Conversion Price shall be adjusted pursuant to this subsection as of the time of actual payment of such dividends or distributions; and (b) no such adjustment shall be made if the holders of Preferred Stock simultaneously receive a dividend or other distribution of shares of Common Stock in a number equal to the number of shares of Common Stock they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event.

4.7 Adjustments for Other Dividends and Distributions. In the event the Corporation at any time or from time to time after the Series B Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in securities of the Corporation (other than a distribution of shares of Common Stock in respect of outstanding shares of Common Stock) or in other property and the provisions of Section 1 do not apply to such dividend or distribution, then and in each such event the holders of Preferred Stock shall receive, simultaneously with the distribution to the holders of Common Stock, a dividend or other distribution of such securities or other property in an amount equal to the amount of such securities or other property they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event.

4.8 Adjustment for Merger or Reorganization, etc. Subject to the provisions of Subsection 2.3, if there shall occur any reorganization, recapitalization, reclassification, consolidation or merger involving the Corporation in which the Common Stock (but not the Preferred Stock) is converted into or exchanged for securities, cash or other property (other than a transaction covered by Subsection 4.4, 4.6 or 4.7), then, following any such reorganization, recapitalization, reclassification, consolidation or merger, each share of Preferred Stock shall thereafter be convertible, in lieu of the Common Stock into which it was convertible prior to such event, into the kind and amount of securities, cash or other property which a holder of the number of shares of the Common Stock issuable upon conversion of one share of such series of Preferred Stock immediately prior to such reorganization, recapitalization, reclassification, consolidation or merger would have been entitled to receive pursuant to such transaction; and, in such case, appropriate adjustment (as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors) shall be made in the application of the provisions in this Section 4 with respect to the rights and interests thereafter of the holders of the Preferred Stock, to the end that the provisions set forth in this Section 4 (including provisions with respect to changes in and other adjustments of the Applicable Preferred Stock Conversion Price) shall thereafter be applicable, as nearly as reasonably may be, in relation to any securities or other property thereafter deliverable upon the conversion of the Preferred Stock. For the avoidance of doubt, nothing in this Section 4.8 shall be construed as preventing the holders of Preferred Stock from seeking any appraisal rights to which they are otherwise entitled under the General Corporation Law in connection with a merger triggering an adjustment hereunder, nor shall this Subsection 4.8 be deemed conclusive evidence of the fair value of the shares of Preferred Stock in any such appraisal proceeding.

4.9 Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of the Applicable Preferred Stock Conversion Price pursuant to this Section 4, the Corporation at its expense shall, as promptly as reasonably practicable but in any event not later than fifteen (15) days thereafter, compute such adjustment or readjustment in accordance with the terms hereof and furnish to each holder of Preferred Stock a certificate setting forth such adjustment or readjustment (including the kind and amount of securities, cash or other property into which the Preferred Stock is convertible) and showing in detail the facts upon which such adjustment or readjustment is based. The Corporation shall, as promptly as reasonably practicable after the written request at any time of any holder of Preferred Stock (but in any event not later than fifteen (15) days thereafter), furnish or cause to be furnished to such holder a certificate setting forth (i) the Applicable Preferred Stock Conversion Price then in effect, and (ii) the number of shares of Common Stock and the amount, if any, of other securities, cash or property which then would be received upon the conversion of Preferred Stock.

4.10 Notice of Record Date. In the event:

(a) the Corporation shall take a record of the holders of its Common Stock (or other capital stock or securities at the time issuable upon conversion of the Preferred Stock) for the purpose of entitling or enabling them to receive any dividend or other distribution, or to receive any right to subscribe for or purchase any shares of capital stock of any class or any other securities, or to receive any other security; or

(b) of any capital reorganization of the Corporation, any reclassification of the Common Stock, or any Deemed Liquidation Event; or

(c) of the voluntary or involuntary dissolution, liquidation or winding-up of the Corporation, then, and in each such case, the Corporation will send or cause to be sent to the holders of the Preferred Stock a notice specifying, as the case may be, (i) the record date for such dividend, distribution or right, and the amount and character of such dividend, distribution or right, or (ii) the effective date on which such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation, winding-up or a Deemed Liquidation Event is proposed to take place, and the time, if any is to be fixed, as of which the holders of record of Common Stock (or such other capital stock or securities at the time issuable upon the conversion of the Preferred Stock) shall be entitled to exchange their shares of Common Stock (or such other capital stock or securities) for securities or other property deliverable upon such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation, winding-up or a Deemed Liquidation Event, and the amount per share and character of such exchange applicable to the Preferred Stock and the Common Stock. Such notice shall be sent at least ten (10) days prior to the record date or effective date for the event specified in such notice.

5. Mandatory Conversion.

5.1 Trigger Events. Upon either (a) the date and time, or the occurrence of an event, specified by vote or written consent of the holders representing (i) the Required Vote and (ii) the Required Series B Vote or (b) the closing of the sale of shares of Common Stock to the public in a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the **"Securities Act"**), provided that such offering results in at least $50 million of gross proceeds, after deducting the underwriting discount and commissions, to the Corporation, with such Common Stock listed on the NYSE or NASDAQ (the date and time specified or the time of the event specified in such vote or written consent, or the time of such closing, respectively, is referred to herein as the "**Mandatory Conversion Time**"), (i) all outstanding shares of Preferred Stock shall automatically be converted into shares of Common Stock, at the then effective conversion rate thereof, and (ii) such shares of Preferred Stock may not be reissued by the Corporation.

5.2 Procedural Requirements. All holders of record of shares of Preferred Stock shall be sent written notice of the Mandatory Conversion Time and the place designated for mandatory conversion of all such shares of Preferred Stock pursuant to this Section 5. Such notice need not be sent in advance of the occurrence of the Mandatory Conversion Time. Upon receipt of such notice, each holder of shares of Preferred Stock shall surrender his, her or its certificate or certificates for all such shares (or, if such holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate) to the Corporation at the place designated in such notice. At the Mandatory Conversion Time, all

outstanding shares of Preferred Stock shall be deemed to have been converted into shares of Common Stock (notwithstanding the failure of the holder or holders thereof to surrender any certificates at or prior to such time), which shall be deemed to be outstanding of record as of such time, and all rights with respect to the Preferred Stock so converted, including the rights, if any, to receive notices and vote (other than as a holder of Common Stock), will terminate, except only the rights of the holders thereof, upon surrender of their certificate or certificates (or lost certificate affidavit and agreement) therefor, to receive the items provided for in the last sentence of this Subsection 5.2, and to receive payment of any declared but unpaid dividends thereon. If so required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or by his, her or its attorney duly authorized in writing. As soon as practicable after the Mandatory Conversion Time and the surrender of the certificate or certificates (or lost certificate affidavit and agreement) for Preferred Stock, the Corporation shall issue and deliver to such holder, or to his, her or its nominees, a certificate or certificates for the number of full shares of Common Stock issuable on such conversion in accordance with the provisions hereof, together with cash as provided in Subsection 4.2 in lieu of any fraction of a share of Common Stock otherwise issuable upon such conversion and the payment of any declared but unpaid dividends on the shares of Preferred Stock converted.

5.3 Effect of Mandatory Conversion. Such converted Preferred Stock shall be retired and cancelled and may not be reissued as shares of such series, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Preferred Stock accordingly.

6. Redeemed or Otherwise Acquired Shares. Any shares of Preferred Stock that are redeemed or otherwise acquired by the Corporation or any of its subsidiaries shall be automatically and immediately cancelled and retired and shall not be reissued, sold or transferred. Neither the Corporation nor any of its subsidiaries may exercise any voting or other rights granted to the holders of Preferred Stock following redemption.

7. Waiver. Except as specifically stated herein, (a) any of the rights, powers, preferences and other terms of the Preferred Stock set forth herein may be waived on behalf of all holders of Preferred Stock by the affirmative written consent or vote of the holders representing the Required Vote, (b) any of the rights, powers, preferences and other terms of the Series A Preferred Stock set forth herein may be waived on behalf of all holders of Series A Preferred Stock by the affirmative written consent or vote of the holders representing the Required Series A Vote and (c) any of the rights, powers, preferences and other terms of the Series B Preferred Stock set forth herein may be waived on behalf of all holders of Series B Preferred Stock by the affirmative written consent or vote of the holders representing the Required Series B Vote.

8. Notices. Any notice required or permitted by the provisions of this Article Fourth to be given to a holder of shares of Preferred Stock shall be mailed, postage prepaid, to the post office address last shown on the records of the Corporation, or given by electronic communication in compliance with the provisions of the General Corporation Law, and shall be deemed sent upon such mailing or electronic transmission.

FIFTH: Subject to any additional vote required by the Certificate of Incorporation, in furtherance and not in limitation of the powers conferred by statute, the Board of Directors is expressly authorized to make, repeal, alter, amend and rescind any or all of the Bylaws of the Corporation.

SIXTH: Subject to any additional vote required by the Certificate of Incorporation, the number of directors of the Corporation shall be determined in the manner set forth in the Bylaws of the Corporation.

SEVENTH: Elections of directors need not be by written ballot unless the Bylaws of the Corporation shall so provide.

EIGHTH: Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws of the Corporation may provide. The books of the Corporation may be kept outside the State of Delaware at such place or places as may be designated from time to time by the Board of Directors or in the Bylaws of the Corporation.

NINTH: To the fullest extent permitted by law, a director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. If the General Corporation Law or any other law of the State of Delaware is amended after approval by the stockholders of this Article Ninth to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law as so amended.

Any repeal or modification of the foregoing provisions of this Article Ninth by the stockholders of the Corporation shall not adversely affect any right or protection of a director of the Corporation existing at the time of, or increase the liability of any director of the Corporation with respect to any acts or omissions of such director occurring prior to, such repeal or modification.

TENTH: To the fullest extent permitted by applicable law, the Corporation is authorized to provide indemnification of (and advancement of expenses to) directors, officers and agents of the Corporation (and any other persons to which General Corporation Law permits the Corporation to provide indemnification) through Bylaw provisions, agreements with such agents or other persons, vote of stockholders or disinterested directors or otherwise, in excess of the indemnification and advancement otherwise permitted by Section 145 of the General Corporation Law.

Any amendment, repeal or modification of the foregoing provisions of this Article Tenth shall not adversely affect any right or protection of any director, officer or other agent of the Corporation existing at the time of such amendment, repeal or modification.

ELEVENTH: The Corporation renounces, to the fullest extent permitted by law, any interest or expectancy of the Corporation in, or in being offered an opportunity to participate in, any Excluded Opportunity (as defined below). An "**Excluded Opportunity**" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which

otherwise comes into the possession of, (i) any director of the Corporation who is not an employee of the Corporation or any of its subsidiaries, or (ii) any holder of Preferred Stock or any partner, member, director, stockholder, employee or agent of any such holder, other than someone who is an employee of the Corporation or any of its subsidiaries ((i) and (ii) collectively, "**Covered Persons**"), unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person's capacity as a director of the Corporation.

* * *

3: That the foregoing amendment and restatement was approved by the holders of the requisite number of shares of this corporation in accordance with Section 228 of the General Corporation Law.

4: That this Second Amended and Restated Certificate of Incorporation, which restates and integrates and further amends the provisions of this Corporation's Amended and Restated Certificate of Incorporation, has been duly adopted in accordance with Sections 242 and 245 of the General Corporation Law.

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IN WITNESS WHEREOF, this Second Amended and Restated Certificate of Incorporation has been executed by a duly authorized officer of this corporation on this 21st day of April, 2017.

By: /S/ JASON GARDNER
Name: Jason Gardner
Title: President and CEO

[SIGNATURE PAGE TO CHARTER]

BY-LAWS

OF

MAGENTA THERAPEUTICS, INC.
(the "Corporation")

1. Stockholders

(a) Annual Meeting. The annual meeting of stockholders shall be held for the election of directors each year at such place, date and time as shall be designated by the Board of Directors. Any other proper business may be transacted at the annual meeting. If no date for the annual meeting is established or said meeting is not held on the date established as provided above, a special meeting in lieu thereof may be held or there may be action by written consent of the stockholders on matters to be voted on at the annual meeting, and such special meeting or written consent shall have for the purposes of these By-laws or otherwise all the force and effect of an annual meeting.

(b) Special Meetings. Special meetings of stockholders may be called by the Chief Executive Officer, if one is elected, or, if there is no Chief Executive Officer, a President, or by the Board of Directors, but such special meetings may not be called by any other person or persons. The call for the meeting shall state the place, date, hour and purposes of the meeting. Only the purposes specified in the notice of special meeting shall be considered or dealt with at such special meeting.

(c) Notice of Meetings. Whenever stockholders are required or permitted to take any action at a meeting, a notice stating the place, if any, date and hour of the meeting, the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present and vote at such meeting, and, in the case of a special meeting, the purpose or purposes of the meeting, shall be given by the Secretary (or other person authorized by these By-laws or by law) not less than ten (10) nor more than sixty (60) days before the meeting to each stockholder entitled to vote thereat and to each stockholder who, under the Certificate of Incorporation or under these By-laws is entitled to such notice. If mailed, notice is given when deposited in the mail, postage prepaid, directed to such stockholder at such stockholder's address as it appears in the records of the Corporation. Without limiting the manner by which notice otherwise may be effectively given to stockholders, any notice to stockholders may be given by electronic transmission in the manner provided in Section 232 of the Delaware General Corporation Law (the "DGCL").

If a meeting is adjourned to another time or place, notice need not be given of the adjourned meeting if the time and place, if any, and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such adjourned meeting are announced at the meeting at which the adjournment is taken, except that if the adjournment is for more than thirty (30) days, or if after the adjournment a new record date is fixed for the adjourned meeting, notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

(d) Quorum. The holders of a majority in interest of all stock issued, outstanding and entitled to vote at a meeting, present in person or represented by proxy, shall constitute a quorum. Any meeting may be adjourned from time to time by a majority of the votes properly cast upon the question, whether or not a quorum is present. The stockholders present at a duly constituted meeting may continue to transact business until adjournment notwithstanding the withdrawal of enough stockholders to reduce the voting shares below a quorum.

(e) Voting and Proxies. Except as otherwise provided by the Certificate of Incorporation or by law, each stockholder entitled to vote at any meeting of stockholders shall be entitled to one (1) vote for each share of stock held by such stockholder which has voting power upon the matter in question. Each stockholder entitled to vote at a meeting of stockholders or to express consent or dissent to corporate action in writing without a meeting may authorize another person or persons to act for such stockholder by either written proxy or by a transmission permitted by Section 212(c) of the DGCL, but no proxy shall be voted or acted upon after three years from its date, unless the proxy provides for a longer period or is irrevocable and coupled with an interest. Proxies shall be filed with the Secretary of the meeting, or of any adjournment thereof. Except as otherwise limited therein, proxies shall entitle the persons authorized thereby to vote at any adjournment of such meeting.

(f) Action at Meeting. When a quorum is present, any matter before the meeting shall be decided by vote of the holders of a majority of the shares of stock voting on such matter except where a larger vote is required by law, by the Certificate of Incorporation or by these By-laws. Any election of directors by stockholders shall be determined by a plurality of the votes cast, except where a larger vote is required by law, by the Certificate of Incorporation or by these By-laws. The Corporation shall not directly or indirectly vote any share of its own stock; provided, however, that the Corporation may vote shares which it holds in a fiduciary capacity to the extent permitted by law.

(g) Presiding Officer. Meetings of stockholders shall be presided over by the Chairman of the Board, if one is elected, or in his or her absence, the Vice Chairman of the Board, if one is elected, or if neither is elected or in their absence, a President. The Board of Directors shall have the authority to appoint a temporary presiding officer to serve at any meeting of the stockholders if the Chairman of the Board, the Vice Chairman of the Board or a President is unable to do so for any reason.

(h) Conduct of Meetings. The Board of Directors may adopt by resolution such rules and regulations for the conduct of the meeting of stockholders as it shall deem appropriate. Except to the extent inconsistent with such rules and regulations as adopted by the Board of Directors, the presiding officer of any meeting of stockholders shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairman, are appropriate for the proper conduct of the meeting. Such rules, regulations or procedures, whether adopted by the Board of Directors or prescribed by the

presiding officer of the meeting, may include, without limitation, the following: (i) the establishment of an agenda or order of business for the meeting; (ii) rules and procedures for maintaining order at the meeting and the safety of those present; (iii) limitations on attendance at or participation in the meeting to stockholders of record of the Corporation, their duly authorized and constituted proxies or such other persons as the chairman of the meeting shall determine; (iv) restrictions on entry to the meeting after the time fixed for the commencement thereof; and (v) limitations on the time allotted to questions or comments by participants. Unless and to the extent determined by the Board of Directors or the presiding officer of the meeting, meetings of stockholders shall not be required to be held in accordance with the rules of parliamentary procedure.

(i) Action without a Meeting. Unless otherwise provided in the Certificate of Incorporation, any action required or permitted by law to be taken at any annual or special meeting of stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing, setting forth the action so taken, shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted and shall be delivered to the Corporation by delivery to its registered office, by hand or by certified mail, return receipt requested, or to the Corporation's principal place of business or to the officer of the Corporation having custody of the minute book. Every written consent shall bear the date of signature and no written consent shall be effective unless, within sixty (60) days of the earliest dated consent delivered pursuant to these By-laws, written consents signed by a sufficient number of stockholders entitled to take action are delivered to the Corporation in the manner set forth in these By-laws. Prompt notice of the taking of the corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing.

(j) Stockholder Lists. The officer who has charge of the stock ledger of the Corporation shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Nothing contained in this Section 1(j) shall require the Corporation to include electronic mail addresses or other electronic contact information on such list. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, for a period of at least ten (10) days prior to the meeting in the manner provided by law. The list shall also be open to the examination of any stockholder during the whole time of the meeting as provided by law.

2. Directors

(a) Powers. The business of the Corporation shall be managed by or under the direction of a Board of Directors who may exercise all the powers of the Corporation except as otherwise provided by law, by the Certificate of Incorporation or by these By-laws. In the event of a vacancy in the Board of Directors, the remaining directors, except as otherwise provided by law, may exercise the powers of the full Board until the vacancy is filled.

(b) Number and Qualification. Unless otherwise provided in the Certificate of Incorporation or in these By-laws, the number of directors which shall constitute the whole board shall be determined from time to time by resolution of the Board of Directors. Directors need not be stockholders.

(c) Vacancies; Reduction of Board. A majority of the directors then in office, although less than a quorum, or a sole remaining Director, may fill vacancies in the Board of Directors occurring for any reason and newly created directorships resulting from any increase in the authorized number of directors. In lieu of filling any vacancy, the Board of Directors may reduce the number of directors.

(d) Tenure. Except as otherwise provided by law, by the Certificate of Incorporation or by these By-laws, directors shall hold office until their successors are elected and qualified or until their earlier resignation or removal. Any director may resign at any time upon notice given in writing or by electronic transmission to the Corporation. Such resignation shall be effective upon receipt unless it is specified to be effective at some other time or upon the happening of some other event.

(e) Removal. To the extent permitted by law, a director may be removed from office with or without cause by vote of the holders of a majority of the shares of stock entitled to vote in the election of directors.

(f) Meetings. Regular meetings of the Board of Directors may be held without notice at such time, date and place as the Board of Directors may from time to time determine. Special meetings of the Board of Directors may be called, orally or in writing, by the Chief Executive Officer, if one is elected, or, if there is no Chief Executive Officer, the President, or by two or more Directors, designating the time, date and place thereof. Directors may participate in meetings of the Board of Directors by means of conference telephone or other communications equipment by means of which all directors participating in the meeting can hear each other, and participation in a meeting in accordance herewith shall constitute presence in person at such meeting.

(g) Notice of Meetings. Notice of the time, date and place of all special meetings of the Board of Directors shall be given to each director by the Secretary, or Assistant Secretary, or in case of the death, absence, incapacity or refusal of such persons, by the officer or one (1) of the directors calling the meeting. Notice shall be given to each director in person, by telephone, or by facsimile, electronic mail or other form of electronic communications, sent to such director’s business or home address at least twenty-four (24) hours in advance of the meeting, or by written notice mailed to such director’s business or home address at least forty-eight (48) hours in advance of the meeting.

(h) Quorum. At any meeting of the Board of Directors, a majority of the total number of directors shall constitute a quorum for the transaction of business. Less than a quorum may adjourn any meeting from time to time and the meeting may be held as adjourned without further notice.

(i) Action at Meeting. At any meeting of the Board of Directors at which a quorum is present, unless otherwise provided in the following sentence, a majority of the directors present may take any action on behalf of the Board of Directors, unless a larger number is required by law, by the Certificate of Incorporation or by these By-laws. So long as there are two (2) or fewer Directors, any action to be taken by the Board of Directors shall require the approval of all Directors.

(j) Action by Consent. Any action required or permitted to be taken at any meeting of the Board of Directors may be taken without a meeting if all members of the Board of Directors consent thereto in writing or by electronic transmission, and the writing or writings or electronic transmission or transmissions are filed with the records of the meetings of the Board of Directors. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

(k) Committees. The Board of Directors may, by resolution passed by a majority of the whole Board of Directors, establish one (1) or more committees, each committee to consist of one or more directors. The Board of Directors may designate one (1) or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of a member of a committee, the member or members thereof present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member.

Any such committee, to the extent permitted by law and to the extent provided in the resolution of the Board of Directors, shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the Corporation, and may authorize the seal of the Corporation to be affixed to all papers which may require it; but no such committee shall have the power or authority in reference to the following: (i) approving or adopting, or recommending to the stockholders, any action or matter expressly required by the DGCL to be submitted to stockholders for approval or (ii) adopting, amending or repealing any provision of these By-laws.

Except as the Board of Directors may otherwise determine, any such committee may make rules for the conduct of its business, but in the absence of such rules its business shall be conducted so far as possible in the same manner as is provided in these By-laws for the Board of Directors. All members of such committees shall hold their committee offices at the pleasure of the Board of Directors, and the Board may abolish any committee at any time.

3. Officers

(a) Enumeration. The officers of the Corporation shall consist of one (1) or more Presidents (who, if there is more than one (1), shall be referred to as Co-Presidents), a Treasurer, a Secretary, and such other officers, including, without limitation, a Chief Executive Officer and one (1) or more Vice Presidents (including Executive Vice Presidents or Senior Vice Presidents), Assistant Vice Presidents, Assistant Treasurers and Assistant Secretaries, as the Board of Directors may determine. The Board of Directors may elect from among its members a Chairman of the Board and a Vice Chairman of the Board.

(b) Election. The Presidents, Treasurer and Secretary shall be elected annually by the Board of Directors at their first meeting following the annual meeting of stockholders. Other officers may be chosen by the Board of Directors at such meeting or at any other meeting.

(c) Qualification. No officer need be a stockholder or Director. Any two or more offices may be held by the same person. Any officer may be required by the Board of Directors to give bond for the faithful performance of such officer's duties in such amount and with such sureties as the Board of Directors may determine.

(d) Tenure. Except as otherwise provided by the Certificate of Incorporation or by these By-laws, each of the officers of the Corporation shall hold office until the first meeting of the Board of Directors following the next annual meeting of stockholders and until such officer's successor is elected and qualified or until such officer's earlier resignation or removal. Any officer may resign by delivering his or her written resignation to the Corporation, and such resignation shall be effective upon receipt unless it is specified to be effective at some other time or upon the happening of some other event.

(e) Removal. The Board of Directors may remove any officer with or without cause by a vote of a majority of the directors then in office.

(f) Vacancies. Any vacancy in any office may be filled for the unexpired portion of the term by the Board of Directors.

(g) Chairman of the Board and Vice Chairman. Unless otherwise provided by the Board of Directors, the Chairman of the Board of Directors, if one is elected, shall preside, when present, at all meetings of the stockholders and the Board of Directors. The Chairman of the Board shall have such other powers and shall perform such duties as the Board of Directors may from time to time designate.

Unless otherwise provided by the Board of Directors, in the absence of the Chairman of the Board, the Vice Chairman of the Board, if one is elected, shall preside, when present, at all meetings of the stockholders and the Board of Directors. The Vice Chairman of the Board shall have such other powers and shall perform such duties as the Board of Directors may from time to time designate.

(h) Chief Executive Officer. The Chief Executive Officer, if one is elected, shall have such powers and shall perform such duties as the Board of Directors may from time to time designate.

(i) Presidents. The Presidents shall, subject to the direction of the Board of Directors, each have general supervision and control of the Corporation's business and any action that would typically be taken by a President may be taken by any Co-President. If there is no Chairman of the Board or Vice Chairman of the Board, a President shall preside, when present, at all meetings of stockholders and the Board of Directors. The Presidents shall have such other powers and shall perform such duties as the Board of Directors may from time to time designate.

(j) Vice Presidents and Assistant Vice Presidents. Any Vice President (including any Executive Vice President or Senior Vice President) and any Assistant Vice President shall have such powers and shall perform such duties as the Board of Directors may from time to time designate.

(k) Treasurer and Assistant Treasurers. The Treasurer shall, subject to the direction of the Board of Directors, have general charge of the financial affairs of the Corporation and shall cause to be kept accurate books of account. The Treasurer shall have custody of all funds, securities, and valuable documents of the Corporation, except as the Board of Directors may otherwise provide. The Treasurer shall have such other powers and shall perform such duties as the Board of Directors may from time to time designate.

Any Assistant Treasurer shall have such powers and perform such duties as the Board of Directors may from time to time designate.

(l) Secretary and Assistant Secretaries. The Secretary shall record the proceedings of all meetings of the stockholders and the Board of Directors (including committees of the Board) in books kept for that purpose. In the absence of the Secretary from any such meeting an Assistant Secretary, or if such person is absent, a temporary secretary chosen at the meeting, shall record the proceedings thereof. The Secretary shall have charge of the stock ledger (which may, however, be kept by any transfer or other agent of the Corporation) and shall have such other duties and powers as may be designated from time to time by the Board of Directors.

Any Assistant Secretary shall have such powers and perform such duties as the Board of Directors may from time to time designate.

(m) Other Powers and Duties. Subject to these By-laws, each officer of the Corporation shall have in addition to the duties and powers specifically set forth in these By-laws, such duties and powers as are customarily incident to such officer's office, and such duties and powers as may be designated from time to time by the Board of Directors.

4. Capital Stock

(a) Certificates of Stock. Each stockholder shall be entitled to a certificate of the capital stock of the Corporation in such form as may from time to time be prescribed by the Board of Directors. Such certificate shall be signed by a President or a Vice President, and by the Treasurer or an Assistant Treasurer, or the Secretary or an Assistant Secretary. Such signatures may be a facsimile. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed on such certificate shall have ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the Corporation with the same effect as if such person were such officer, transfer agent or registrar at the time of its issue. Every certificate for shares of stock which are subject to any restriction on transfer and every certificate issued when the Corporation is authorized to issue more than one (1) class or series of stock shall contain such legend with respect thereto as is required by law. The Corporation shall be permitted to issue fractional shares.

(b) Transfers. Subject to any restrictions on transfer, shares of stock may be transferred on the books of the Corporation by the surrender to the Corporation or its transfer agent of the certificate therefor properly endorsed or accompanied by a written assignment or power of attorney properly executed, with transfer stamps (if necessary) affixed, and with such proof of the authenticity of signature as the Corporation or its transfer agent may reasonably require.

(c) Record Holders. Except as may otherwise be required by law, by the Certificate of Incorporation or by these By-laws, the Corporation shall be entitled to treat the record holder of stock as shown on its books as the owner of such stock for all purposes, including the payment of dividends and the right to vote with respect thereto, regardless of any transfer, pledge or other disposition of such stock, until the shares have been transferred on the books of the Corporation in accordance with the requirements of these By-laws.

It shall be the duty of each stockholder to notify the Corporation of such stockholder's post office address.

(d) Record Date. In order that the Corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, or to consent to corporate action in writing without a meeting, or entitled to receive payment of any dividend or other distribution or allotment of any rights, or entitled to exercise any rights in respect of any change, conversion or exchange of stock or for the purpose of any other lawful action, the Board of Directors may fix, in advance, a record date, which shall not precede the date on which it is established, and which shall not be more than sixty (60) nor less than ten (10) days before the date of such meeting, more than ten (10) days after the date on which the record date for stockholder consent without a meeting is established, nor more than sixty (60) days prior to any other action. In such case only stockholders of record on such record date shall be so entitled notwithstanding any transfer of stock on the books of the Corporation after the record date.

If no record date is fixed, (i) the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held, (ii) the record date for determining stockholders entitled to consent to corporate action in writing without a meeting, when no prior action by the Board of Directors is necessary, shall be the first date on which a signed written consent setting forth the action taken or proposed to be taken is delivered to the Corporation by delivery to its registered office in this state, to its principal place of business, or to an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded, and (iii) the record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

(e) Lost Certificates. The Corporation may issue a new certificate of stock in the place of any certificate theretofore issued by it, alleged to have been lost, stolen or destroyed, and the Corporation may require the owner of the lost, stolen or destroyed certificate, or his legal representative, to give the Corporation a bond sufficient to indemnify it against any claim that may be made against it on account of the alleged loss, theft or destruction of any such certificate or the issuance of such new certificate.

5. Indemnification

(a) Definitions. For purposes of this Section 5:

(i) "Corporate Status" describes the status of a person who is serving or has served (A) as a Director of the Corporation, (B) as an Officer of the Corporation, (C) as a Non-Officer Employee of the Corporation, or (D) as a director, partner, trustee, officer, employee or agent of any other corporation, partnership, limited liability company, joint venture, trust, employee benefit plan, foundation, association, organization or other legal entity for which such person is or was serving at the request of the Corporation. For purposes of this Section 5(a)(i), a Director, Officer or Non-Officer Employee of the Corporation who is serving or has served as a director, partner, trustee, officer, employee or agent of a Subsidiary shall be deemed to be serving at the request of the Corporation. Notwithstanding the foregoing, "Corporate Status" shall not include the status of a person who is serving or has served as a director, officer, employee or agent of a constituent corporation absorbed in a merger or consolidation transaction with the Corporation with respect to such person's activities prior to said transaction, unless specifically authorized by the Board of Directors or the stockholders of the Corporation;

(ii) "Director" means any person who serves or has served the Corporation as a director on the Board of Directors of the Corporation;

(iii) "Disinterested Director" means, with respect to each Proceeding in respect of which indemnification is sought hereunder, a Director of the Corporation who is not and was not a party to such Proceeding;

(iv) "Expenses" means all reasonable attorneys fees, retainers, court costs, transcript costs, fees of expert witnesses, private investigators and professional advisors (including, without limitation, accountants and investment bankers), travel expenses, duplicating costs, printing and binding costs, costs of preparation of demonstrative evidence and other courtroom presentation aids and devices, costs incurred in connection with document review, organization, imaging and computerization, telephone charges, postage, delivery service fees, and all other disbursements, costs or expenses of the type customarily incurred in connection with prosecuting, defending, preparing to prosecute or defend, investigating, being or preparing to be a witness in, settling or otherwise participating in, a Proceeding;

(v) "Liabilities" means judgments, damages, liabilities, losses, penalties, excise taxes, fines and amounts paid in settlement;

(vi) “Non-Officer Employee” means any person who serves or has served as an employee or agent of the Corporation, but who is not or was not a Director or Officer;

(vii) “Officer” means any person who serves or has served the Corporation as an officer of the Corporation appointed by the Board of Directors of the Corporation;

(viii) “Proceeding” means any threatened, pending or completed action, suit, arbitration, alternate dispute resolution mechanism, inquiry, investigation, administrative hearing or other proceeding, whether civil, criminal, administrative, arbitrative or investigative; and

(ix) “Subsidiary” shall mean any corporation, partnership, limited liability company, joint venture, trust or other entity of which the Corporation owns (either directly or through or together with another Subsidiary of the Corporation) either (i) a general partner, managing member or other similar interest or (ii) (A) 50% or more of the voting power of the voting capital equity interests of such corporation, partnership, limited liability company, joint venture or other entity, or (B) 50% or more of the outstanding voting capital stock or other voting equity interests of such corporation, partnership, limited liability company, joint venture or other entity.

(b) Indemnification of Directors and Officers. Subject to the operation of Section 5(d) of these By-laws, each Director and Officer shall be indemnified and held harmless by the Corporation to the fullest extent authorized by the DGCL, as the same exists or may hereafter be amended (but, in the case of any such amendment, only to the extent that such amendment permits the Corporation to provide broader indemnification rights than such law permitted the Corporation to provide prior to such amendment), and to the extent authorized in subsections (i) through (iv) of this Section 5(b).

(i) Actions, Suits and Proceedings Other than By or In the Right of the Corporation. Each Director and Officer shall be indemnified and held harmless by the Corporation against any and all Expenses and Liabilities that are incurred or paid by such Director or Officer or on such Director’s or Officer’s behalf in connection with any Proceeding or any claim, issue or matter therein (other than an action by or in the right of the Corporation), which such Director or Officer is, or is threatened to be made, a party to or participant in by reason of such Director’s or Officer’s Corporate Status, if such Director or Officer acted in good faith and in a manner such Director or Officer reasonably believed to be in or not opposed to the best interests of the Corporation and, with respect to any criminal proceeding, had no reasonable cause to believe his or her conduct was unlawful.

(ii) Actions, Suits and Proceedings By or In the Right of the Corporation. Each Director and Officer shall be indemnified and held harmless by the Corporation against any and all Expenses that are incurred by such Director or Officer or on such Director’s or Officer’s behalf in connection with any Proceeding or any claim, issue or matter therein by or in the right of the Corporation, which such Director or

Officer is, or is threatened to be made, a party to or participant in by reason of such Director's or Officer's Corporate Status, if such Director or Officer acted in good faith and in a manner such Director or Officer reasonably believed to be in or not opposed to the best interests of the Corporation; provided, however, that no indemnification shall be made under this Section 5(b)(ii) in respect of any claim, issue or matter as to which such Director or Officer shall have been finally adjudged by a court of competent jurisdiction to be liable to the Corporation, unless, and only to the extent that, the Court of Chancery or another court in which such Proceeding was brought shall determine upon application that, despite adjudication of liability, but in view of all the circumstances of the case, such Director or Officer is fairly and reasonably entitled to indemnification for such Expenses that such court deems proper.

(iii) Survival of Rights. The rights of indemnification provided by this Section 5(b) shall continue as to a Director or Officer after he or she has ceased to be a Director or Officer and shall inure to the benefit of his or her heirs, executors, administrators and personal representatives.

(iv) Actions by Directors or Officers. Notwithstanding the foregoing, the Corporation shall indemnify any Director or Officer seeking indemnification in connection with a Proceeding initiated by such Director or Officer only if such Proceeding (including any parts of such Proceeding not initiated by such Director or Officer) was authorized in advance by the Board of Directors of the Corporation, unless such Proceeding was brought to enforce such Officer's or Director's rights to indemnification or, in the case of Directors, advancement of Expenses under these By-laws in accordance with the provisions set forth herein.

(c) Indemnification of Non-Officer Employees. Subject to the operation of Section 5(d) of these By-laws, each Non-Officer Employee may, in the discretion of the Board of Directors of the Corporation, be indemnified by the Corporation to the fullest extent authorized by the DGCL, as the same exists or may hereafter be amended, against any or all Expenses and Liabilities that are incurred by such Non-Officer Employee or on such Non-Officer Employee's behalf in connection with any threatened, pending or completed Proceeding, or any claim, issue or matter therein, which such Non-Officer Employee is, or is threatened to be made, a party to or participant in by reason of such Non-Officer Employee's Corporate Status, if such Non-Officer Employee acted in good faith and in a manner such Non-Officer Employee reasonably believed to be in or not opposed to the best interests of the Corporation and, with respect to any criminal proceeding, had no reasonable cause to believe his or her conduct was unlawful. The rights of indemnification provided by this Section 5(c) shall exist as to a Non-Officer Employee after he or she has ceased to be a Non-Officer Employee and shall inure to the benefit of his or her heirs, personal representatives, executors and administrators. Notwithstanding the foregoing, the Corporation may indemnify any Non-Officer Employee seeking indemnification in connection with a Proceeding initiated by such Non-Officer Employee only if such Proceeding was authorized in advance by the Board of Directors of the Corporation.

(d) Determination. Unless ordered by a court, no indemnification shall be provided pursuant to this Section 5 to a Director, to an Officer or to a Non-Officer Employee unless a determination shall have been made that such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the Corporation and, with respect to any criminal Proceeding, such person had no reasonable cause to believe his or her conduct was unlawful. Such determination shall be made by (i) a majority vote of the Disinterested Directors, even though less than a quorum of the Board of Directors, (ii) a committee comprised of Disinterested Directors, such committee having been designated by a majority vote of the Disinterested Directors (even though less than a quorum), (iii) if there are no such Disinterested Directors, or if a majority of Disinterested Directors so directs, by independent legal counsel in a written opinion, or (iv) by the stockholders of the Corporation.

(e) Advancement of Expenses to Directors Prior to Final Disposition.

(i) The Corporation shall advance all Expenses incurred by or on behalf of any Director in connection with any Proceeding in which such Director is involved by reason of such Director's Corporate Status within thirty (30) days after the receipt by the Corporation of a written statement from such Director requesting such advance or advances from time to time, whether prior to or after final disposition of such Proceeding. Such statement or statements shall reasonably evidence the Expenses incurred by such Director and shall be preceded or accompanied by an undertaking by or on behalf of such Director to repay any Expenses so advanced if it shall ultimately be determined that such Director is not entitled to be indemnified against such Expenses. Notwithstanding the foregoing, the Corporation shall advance all Expenses incurred by or on behalf of any Director seeking advancement of expenses hereunder in connection with a Proceeding initiated by such Director only if such Proceeding (including any parts of such Proceeding not initiated by such Director) was (A) authorized by the Board of Directors of the Corporation, or (B) brought to enforce such Director's rights to indemnification or advancement of Expenses under these By-laws.

(ii) If a claim for advancement of Expenses hereunder by a Director is not paid in full by the Corporation within thirty (30) days after receipt by the Corporation of documentation of Expenses and the required undertaking, such Director may at any time thereafter bring suit against the Corporation to recover the unpaid amount of the claim and if successful in whole or in part, such Director shall also be entitled to be paid the expenses of prosecuting such claim. The failure of the Corporation (including its Board of Directors or any committee thereof, independent legal counsel, or stockholders) to make a determination concerning the permissibility of such advancement of Expenses under this Section 5 shall not be a defense to an action brought by a Director for recovery of the unpaid amount of an advancement claim and shall not create a presumption that such advancement is not permissible. The burden of proving that a Director is not entitled to an advancement of expenses shall be on the Corporation.

(iii) In any suit brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Corporation shall be entitled to recover such expenses upon a final adjudication that the Director has not met any applicable standard for indemnification set forth in the DGCL.

(f) Advancement of Expenses to Officers and Non-Officer Employees Prior to Final Disposition.

(i) The Corporation may, at the discretion of the Board of Directors of the Corporation, advance any or all Expenses incurred by or on behalf of any Officer or any Non-Officer Employee in connection with any Proceeding in which such person is involved by reason of his or her Corporate Status as an Officer or Non-Officer Employee upon the receipt by the Corporation of a statement or statements from such Officer or Non-Officer Employee requesting such advance or advances from time to time, whether prior to or after final disposition of such Proceeding. Such statement or statements shall reasonably evidence the Expenses incurred by such Officer or Non-Officer Employee and shall be preceded or accompanied by an undertaking by or on behalf of such person to repay any Expenses so advanced if it shall ultimately be determined that such Officer or Non-Officer Employee is not entitled to be indemnified against such Expenses.

(ii) In any suit brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Corporation shall be entitled to recover such expenses upon a final adjudication that the Officer or Non-Officer Employee has not met any applicable standard for indemnification set forth in the DGCL.

(g) Contractual Nature of Rights.

(i) The provisions of this Section 5 shall be deemed to be a contract between the Corporation and each Director and Officer entitled to the benefits hereof at any time while this Section 5 is in effect, in consideration of such person's past or current and any future performance of services for the Corporation. Neither amendment, repeal or modification of any provision of this Section 5 nor the adoption of any provision of the Certificate of Incorporation inconsistent with this Section 5 shall eliminate or reduce any right conferred by this Section 5 in respect of any act or omission occurring, or any cause of action or claim that accrues or arises or any state of facts existing, at the time of or before such amendment, repeal, modification or adoption of an inconsistent provision (even in the case of a proceeding based on such a state of facts that is commenced after such time), and all rights to indemnification and advancement of Expenses granted herein or arising out of any act or omission shall vest at the time of the act or omission in question, regardless of when or if any proceeding with respect to such act or omission is commenced. The rights to indemnification and to advancement of expenses provided by, or granted pursuant to, this Section 5 shall continue notwithstanding that the person has ceased to be a director or officer of the Corporation and shall inure to the benefit of the estate, heirs, executors, administrators, legatees and distributees of such person.

(ii) If a claim for indemnification hereunder by a Director or Officer is not paid in full by the Corporation within sixty (60) days after receipt by the Corporation of a written claim for indemnification, such Director or Officer may at any time thereafter bring suit against the Corporation to recover the unpaid amount of the claim, and if successful in whole or in part, such Director or Officer shall also be entitled to be paid the expenses of prosecuting such claim. The failure of the Corporation (including its Board of Directors or any committee thereof, independent legal counsel, or stockholders) to make a determination concerning the permissibility of such indemnification under this Section 5 shall not be a defense to an action brought by a Director or Officer for recovery of the unpaid amount of an indemnification claim and shall not create a presumption that such indemnification is not permissible. The burden of proving that a Director or Officer is not entitled to indemnification shall be on the Corporation.

(iii) In any suit brought by a Director or Officer to enforce a right to indemnification hereunder, it shall be a defense that such Director or Officer has not met any applicable standard for indemnification set forth in the DGCL.

(h) Non-Exclusivity of Rights. The rights to indemnification and advancement of Expenses set forth in this Section 5 shall not be exclusive of any other right which any Director, Officer, or Non-Officer Employee may have or hereafter acquire under any statute, provision of the Certificate or these By-laws, agreement, vote of stockholders or Disinterested Directors or otherwise.

(i) Insurance. The Corporation may maintain insurance, at its expense, to protect itself and any Director, Officer or Non-Officer Employee against any liability of any character asserted against or incurred by the Corporation or any such Director, Officer or Non-Officer Employee, or arising out of any such person's Corporate Status, whether or not the Corporation would have the power to indemnify such person against such liability under the DGCL or the provisions of this Section 5.

(j) Other Indemnification. The Corporation's obligation, if any, to indemnify or provide advancement of Expenses to any person under this Section 5 as a result of such person serving, at the request of the Corporation, as a director, partner, trustee, officer, employee or agent of another corporation, partnership, joint venture, trust, employee benefit plan or other enterprise shall be reduced by any amount such person may collect as indemnification or advancement of Expenses from such other corporation, partnership, joint venture, trust, employee benefit plan or enterprise (the "Primary Indemnitor"). Any indemnification or advancement of Expenses under this Section 5 owed by the Corporation as a result of a person serving, at the request of the Corporation, as a director, partner, trustee, officer, employee or agent of another corporation, partnership, joint venture, trust, employee benefit plan or other enterprise shall only be in excess of, and shall be secondary to, the indemnification or advancement of Expenses available from the applicable Primary Indemnitor(s) and any applicable insurance policies.

6. Miscellaneous Provisions

(a) Fiscal Year. Except as otherwise determined by the Board of Directors, the fiscal year of the Corporation shall end on December 31 of each year.

(b) Seal. The Board of Directors shall have power to adopt and alter the seal of the Corporation.

(c) Execution of Instruments. Subject to any limitations which may be set forth in a resolution of the Board of Directors, all deeds, leases, transfers, contracts, bonds, notes and other obligations to be entered into by the Corporation in the ordinary course of its business without director action may be executed on behalf of the Corporation by, a President, or by any other officer, employee or agent of the Corporation as the Board of Directors may authorize.

(d) Voting of Securities. Unless the Board of Directors otherwise provides, a President, any Vice President or the Treasurer may waive notice of and act on behalf of this Corporation, or appoint another person or persons to act as proxy or attorney in fact for this Corporation with or without discretionary power and/or power of substitution, at any meeting of stockholders or shareholders of any other corporation or organization, any of whose securities are held by this Corporation.

(e) Resident Agent. The Board of Directors may appoint a resident agent upon whom legal process may be served in any action or proceeding against the Corporation.

(f) Corporate Records. The original or attested copies of the Certificate of Incorporation, By-laws and records of all meetings of the incorporators, stockholders and the Board of Directors and the stock and transfer records, which shall contain the names of all stockholders, their record addresses and the amount of stock held by each, shall be kept at the principal office of the Corporation, at the office of its counsel, or at an office of its transfer agent.

(g) Certificate of Incorporation. All references in these By-laws to the Certificate of Incorporation shall be deemed to refer to the Certificate of Incorporation of the Corporation, as amended and in effect from time to time.

(h) Amendments. These By-laws may be altered, amended or repealed, and new By-laws may be adopted, by the stockholders or by the Board of Directors; provided, that (a) the Board of Directors may not alter, amend or repeal any provision of these By-laws which by law, by the Certificate of Incorporation or by these By-laws requires action by the stockholders and (b) any alteration, amendment or repeal of these By-laws by the Board of Directors and any new By-law adopted by the Board of Directors may be altered, amended or repealed by the stockholders.

(i) Waiver of Notice. Whenever notice is required to be given under any provision of these By-laws, a written waiver, signed by the person entitled to notice, or a waiver by electronic transmission by the person entitled to notice, whether before or after the time of the event for which notice is to be given, shall be deemed equivalent to notice. Attendance of a person at a meeting shall constitute a waiver of notice of such meeting, except when the person attends a meeting for the express purpose of objecting at the beginning of the meeting to the transaction of any business because the meeting is not lawfully called or convened. Neither the business to be transacted at, nor the purpose of, any meeting needs to be specified in any written waiver or any waiver by electronic transmission.

Adopted: June 17, 2015
Amended: February 10, 2016

MAGENTA THERAPEUTICS, INC.

AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

April 21, 2017

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MAGENTA THERAPEUTICS, INC.

AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

THIS AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT (this "**Agreement**") is made as of April 21, 2017, by and among Magenta Therapeutics, Inc., a Delaware corporation (the "**Company**"), each investor listed on Schedule A hereto, each of which is referred to in this Agreement as an "**Investor**" and collectively, the "**Investors**".

RECITALS*:*

WHEREAS, certain of the Investors (the "**Existing Investors**") hold shares of the Company's Series A Preferred Stock and/or shares of Common Stock issued upon conversion thereof and possess registration rights, information rights, rights of first offer and other rights pursuant to an Investors' Rights Agreement dated November 10, 2016 between the Company and such Investors (the "**Prior Agreement**");

WHEREAS, the Existing Investors are holders of 75% of the Registrable Securities of the Company (as defined in the Prior Agreement), and desire to amend and restate the Prior Agreement in its entirety and to accept the rights created pursuant to this Agreement in lieu of the rights granted to them under the Prior Agreement; and

WHEREAS, certain of the Investors are parties to that certain Series B Preferred Stock Purchase Agreement of even date herewith between the Company and such Investors (as the same may be amended or restated from time to time, the "**Purchase Agreement**"), under which certain of the Company's and such Investors' obligations are conditioned upon the execution and delivery of this Agreement by such Investors, Existing Investors holding a majority of the Registrable Securities, and the Company.

NOW, THEREFORE, the parties hereby agree as follows:

1. Definitions. For purposes of this Agreement:

1.1 "**Affiliate**" means, with respect to any specified Person, any other Person who or which, directly or indirectly, controls, is controlled by, or is under common control with such specified Person, including, without limitation, any partner, officer, director, member or employee of such specified Person and any venture capital fund now or hereafter existing that is controlled by or under common control with one or more general partners or managing members of, or shares the same management company with, such specified Person. Third Rock Ventures IV, L.P., Atlas Venture Fund X, L.P. and the Company shall not be deemed to be Affiliated for the purposes of this Agreement.

1.2 **"Board of Directors"** means the Company's Board of Directors.

1.3 "**Business Day**" means a day (i) other than Saturday or Sunday and (ii) on which commercial banks are open for business in Boston, Massachusetts.

1.4 "**Certificate of Incorporation**" means the Company's Second Amended and Restated Certificate of Incorporation, as the same may be amended, restated or otherwise modified from time to time.

1.5 "**Common Stock**" means shares of the Company's common stock, par value $0.001 per share.

1.6 "**Competitor**" means a Person engaged, directly or indirectly (including through any partnership, limited liability company, corporation, joint venture or similar arrangement (whether now existing or formed hereafter)), in activities or a line of business that are directly or indirectly competitive with Company's business as then conducted or as then proposed to be conducted, but shall not include (i) any financial investment firm or collective investment vehicle solely by virtue of its ownership (and/or its Affiliates' ownership) of an equity interest in any Competitor held solely for investment purposes, (ii) as of the date hereof, Be The Match BioTherapies, LLC, or (iii) GV 2016, L.P. or any of its affiliated funds, solely as a result of any affiliation between such fund and Alphabet Inc. (including any Affiliate of Alphabet Inc.).

1.7 "**Damages**" means any loss, damage, claim or liability (joint or several) to which a party hereto may become subject under the Securities Act, the Exchange Act, or other federal or state law, insofar as such loss, damage, claim or liability (or any action in respect thereof) arises out of or is based upon (i) any untrue statement or alleged untrue statement of a material fact contained in any registration statement of the Company, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto; (ii) an omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein not misleading; or (iii) any violation or alleged violation by the indemnifying party (or any of its agents or Affiliates) of the Securities Act, the Exchange Act, any state securities law, or any rule or regulation promulgated under the Securities Act, the Exchange Act, or any state securities law.

1.8 "**Deemed Liquidation Event**" shall have the meaning given to such term in the Certificate of Incorporation.

1.9 "**Derivative Securities**" means any securities or rights convertible into, or exercisable or exchangeable for (in each case, directly or indirectly), Common Stock, including options and warrants.

1.10 "**Exchange Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

1.11 "**Excluded Registration**" means (i) a registration relating to the sale of securities to employees of the Company or a subsidiary pursuant to a stock option, stock purchase, or similar plan; (ii) a registration relating to an SEC Rule 145 transaction; or (iii) a registration on any form that does not include substantially the same information as would be required to be included in a registration statement covering the sale of the Registrable Securities.

1.12 “**Form S-1**” means such form under the Securities Act as in effect on the date hereof or any successor registration form under the Securities Act subsequently adopted by the SEC.

1.13 “**Form S-3**” means such form under the Securities Act as in effect on the date hereof, any successor registration form under the Securities Act subsequently adopted by the SEC or any other registration form under the Securities Act adopted by the SEC that permits incorporation of substantial information by reference to other documents filed by the Company with the SEC.

1.14 “**GAAP**” means generally accepted accounting principles in the United States.

1.15 “**Holder**” means any holder of Registrable Securities who is a party to this Agreement.

1.16 “**Immediate Family Member**” means a child, stepchild, grandchild, parent, stepparent, grandparent, spouse, sibling, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, of a natural person referred to herein.

1.17 “**Initiating Holders**” means, collectively, Holders who properly initiate a registration request under this Agreement.

1.18 “**IPO**” means the Company’s first underwritten public offering of its Common Stock under the Securities Act.

1.19 “**Key Employee**” shall have the definition ascribed to it under the Purchase Agreement.

1.20 “**Major Investor**” means (i) any Investor that, individually or together with such Investor’s Affiliates, holds at least 800,000 shares of Registrable Securities determined as of the date hereof (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization occurring after the date of this Agreement).

1.21 “**New Securities**” means, collectively, equity securities of the Company, whether or not currently authorized, as well as rights, options, or warrants to purchase such equity securities, or securities of any type whatsoever that are, or may become, convertible or exchangeable into or exercisable for such equity securities.

1.22 “**Person**” means any individual, corporation, partnership, trust, limited liability company, association or other entity.

1.23 “**Preferred Directors**” means, collectively, the Series A Directors and the Series B Director.

1.24 “**Preferred Stock**” means, collectively, the Series A Preferred Stock and the Series B Preferred Stock.

1.25 "**QPO**" shall have the meaning set forth in the Certificate of Incorporation.

1.26 "**Registrable Securities**" means (i) the Common Stock issuable or issued upon conversion of the Preferred Stock; (ii) any Common Stock, or any Common Stock issued or issuable (directly or indirectly) upon conversion and/or exercise of any other securities of the Company, held by the Major Investors or acquired by the Major Investors after the date hereof; and (iii) any Common Stock issued as (or issuable upon the conversion or exercise of any warrant, right, or other security that is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of, the shares referenced in clauses (i) and (ii) above; provided that, (A) in all cases, any Registrable Securities sold by a Person in a transaction in which the applicable rights under this Agreement are not assigned pursuant to Section 6.1 shall cease to be Registrable Securities, and (B) for purposes of Section 2, any Registrable Securities for which registration rights have terminated pursuant to Section 2.13 of this Agreement shall cease to be Registrable Securities.

1.27 "**Registrable Securities then outstanding**" means the number of shares at a point in time determined by adding the number of shares of outstanding Common Stock that are Registrable Securities at such time and the number of shares of Common Stock issuable (directly or indirectly) at such time pursuant to then exercisable and/or convertible securities that are Registrable Securities.

1.28 "**Restricted Securities**" means the securities of the Company required to bear the legend set forth in Section 2.12(b) hereof.

1.29 "**SEC**" means the Securities and Exchange Commission.

1.30 "**SEC Rule 144**" means Rule 144 promulgated by the SEC under the Securities Act, or any successor provisions.

1.31 "**SEC Rule 145**" means Rule 145 promulgated by the SEC under the Securities Act, or any successor provisions.

1.32 "**Securities Act**" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

1.33 "**Selling Expenses**" means all underwriting discounts, selling commissions, and stock transfer taxes applicable to the sale of Registrable Securities, and fees and disbursements of counsel for any Holder, except for the fees and disbursements of the Selling Holder Counsel borne and paid by the Company as provided in Section 2.6.

1.34 "**Series A Directors**" means the directors of the Company that the holders of record of the Series A Preferred Stock are entitled to elect pursuant to the Certificate of Incorporation.

1.35 "**Series B Director**" means the director of the Company that the holders of record of the Series B Preferred Stock are entitled to elect pursuant to the Certificate of Incorporation.

1.36 "**Series A Preferred Stock**" means shares of the Company's Series A Preferred Stock, par value $0.001 per share.

1.37 "**Series B Preferred Stock**" means shares of the Company's Series B Preferred Stock, par value $0.001 per share.

1.38 "**Stockholders Agreement**" means the Amended and Restated Stockholders Agreement dated as of the date hereof, by and among the Company, the Investors, and Key Holders (as defined therein), as the same may be amended, restated or otherwise modified from time to time.

2. Registration Rights. The Company covenants and agrees as follows:

2.1 Demand Registration.

(a) Form S-1 Demand. Beginning upon the earlier of (i) five (5) years after the date of this Agreement or (ii) six (6) months after the effective date of the registration statement for the IPO, if the Company receives a request from Holders of at least twenty-five percent (25%) of the Registrable Securities then outstanding that the Company file a Form S-1 registration statement with respect to at least twenty-five percent (25%) of the Registrable Securities then outstanding, having the anticipated aggregate offering amount of at least $3.0 million, then the Company shall (x) within ten (10) days after the date such request is given, give notice thereof (the "**Demand Notice**") to all Holders other than the Initiating Holders; and (y) as soon as practicable, and in any event within sixty (60) days after the date such request is given by the Initiating Holders, file a Form S-1 registration statement under the Securities Act covering all Registrable Securities that the Initiating Holders requested to be registered and any additional Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days after the date the Demand Notice is given, and in each case, subject to the limitations of Section 2.1(c) and Section 2.3.

(b) Form S-3 Demand. If at any time when it is eligible to use a Form S-3 registration statement, the Company receives a request from Holders of at least ten percent (10%) of the Registrable Securities then outstanding that the Company file a Form S-3 registration statement with respect to outstanding Registrable Securities of such Holders having an anticipated aggregate offering amount, net of Selling Expenses, of at least $1.0 million, then the Company shall (i) within ten (10) days after the date such request is given, give a Demand Notice to all Holders other than the Initiating Holders; and (ii) as soon as practicable, and in any event within forty-five (45) days after the date such request is given by the Initiating Holders, file a Form S-3 registration statement under the Securities Act covering all Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days of the date the Demand Notice is given, and in each case, subject to the limitations of Section 2.1(c) and Section 2.3.

(c) Notwithstanding the foregoing obligations, if the Company furnishes to Holders requesting a registration pursuant to this Section 2.1 a certificate signed by the Company's chief executive officer or other most senior executive officer then in office

stating that in the good faith judgment of the Board of Directors it would be materially detrimental to the Company and its stockholders for such registration statement to either become effective or remain effective for as long as such registration statement otherwise would be required to remain effective, because such action would (i) materially interfere with a significant acquisition, corporate reorganization, or other similar transaction involving the Company; (ii) require premature disclosure of material information that the Company has a bona fide business purpose for preserving as confidential; or (iii) render the Company unable to comply with requirements under the Securities Act or Exchange Act, then the Company shall have the right to defer taking action with respect to such filing, and any time periods with respect to filing or effectiveness thereof shall be tolled correspondingly, for a period of not more than one hundred twenty (120) days after the request of the Initiating Holders is given; provided, however, that the Company may not invoke this right more than once in any twelve (12) month period, nor shall the Company invoke this right more than twice in all periods; and provided further that the Company shall not register any securities for its own account or that of any other stockholder during either one hundred twenty (120) day period other than an Excluded Registration.

(d) The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Section 2.1(a) (i) if it delivers notice to the Holders within thirty (30) days after any registration request of its intent to file a registration statement for a public offering within ninety (90) days; (ii) during the period that is one hundred eighty (180) days after commencing a Company-initiated registration; (iii) after the Company has effected two (2) registrations pursuant to Section 2.1(a); or (iv) if the Initiating Holders propose to dispose of shares of Registrable Securities that may be immediately registered on Form S-3 pursuant to a request made pursuant to Section 2.1(b). The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Section 2.1(b) if the Company has effected two (2) registrations pursuant to Section 2.1(b) within the twelve (12) month period immediately preceding the date of such request. A registration shall not be counted as "effected" for purposes of this Section 2.1(d) until such time as the applicable registration statement has been declared effective by the SEC, unless the Initiating Holders withdraw their request for such registration (other than as a result of a material adverse change to the Company), elect not to pay the registration expenses therefor, and forfeit their right to one demand registration statement pursuant to Section 2.6, in which case such withdrawn registration statement shall be counted as "effected" for purposes of this Section 2.1(d).

2.2 Company Registration. If the Company proposes to register (including, for this purpose, a registration effected by the Company for stockholders other than the Holders) any of its Common Stock under the Securities Act in connection with the public offering of such securities solely for cash (other than in an Excluded Registration), the Company shall, at such time, promptly give each Holder notice of such registration. Upon the request of each Holder given within twenty (20) days after such notice is given by the Company, the Company shall, subject to the provisions of Section 2.3, cause to be registered all of the Registrable Securities that each such Holder has requested to be included in such registration. The Company shall have the right to terminate or withdraw any registration initiated by it under this Section 2.2 before the effective date of such registration, whether or not any Holder has elected to include Registrable Securities in such registration. The expenses (other than Selling Expenses) of such withdrawn registration shall be borne by the Company in accordance with Section 2.6.

2.3 Underwriting Requirements.

(a) If, pursuant to Section 2.1, the Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to Section 2.1, and the Company shall include such information in the Demand Notice. The underwriter(s) will be selected by the Company and shall be reasonably acceptable to a majority in interest of the Initiating Holders. In such event, the right of any Holder to include such Holder's Registrable Securities in such registration shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting to the extent provided herein. All Holders proposing to distribute their securities through such underwriting shall (together with the Company as provided in Section 2.4(e)) enter into an underwriting agreement in customary form with the underwriter(s) selected for such underwriting. Notwithstanding any other provision of this Section 2.3, if the managing underwriter(s) advise the Initiating Holders in writing that marketing factors require a limitation on the number of shares to be underwritten, then the Initiating Holders shall so advise all Holders that otherwise would be underwritten pursuant hereto, and the number of Registrable Securities that may be included in the underwriting shall be allocated among such Holders, including the Initiating Holders, in proportion (as nearly as practicable) to the number of Registrable Securities owned by each Holder, or in such other proportion as shall mutually be agreed to by all such selling Holders; provided, however, that the number of Registrable Securities held by the Holders to be included in such underwriting shall not be reduced unless all other securities are first entirely excluded from the underwriting. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest 100 shares.

(b) In connection with any offering involving an underwriting of shares of the Company's capital stock pursuant to Section 2.2, the Company shall not be required to include any of the Registrable Securities in such underwriting unless the Holders accept the terms of the underwriting as agreed upon between the Company and its underwriters, and then only in such quantity as the underwriters in their sole discretion determine will not jeopardize the success of the offering by the Company. If the total number of securities, including Registrable Securities, requested by stockholders to be included in such offering exceeds the number of securities to be sold (other than by the Company) that the underwriters in their reasonable discretion determine is compatible with the success of the offering, then the Company shall be required to include in the offering only that number of such securities, including Registrable Securities, which the underwriters and the Company in their sole discretion determine will not jeopardize the success of the offering. If the underwriters determine that less than all of the Registrable Securities requested to be registered can be included in such offering, then the Registrable Securities that are included in such offering shall be allocated among the selling Holders in proportion (as nearly as practicable to) the number of Registrable Securities owned by each selling Holder or in such other proportions as shall mutually be agreed to by all such selling Holders. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest 100 shares. Notwithstanding the foregoing, in no event shall (i) the number of Registrable Securities included in the offering be reduced unless all other securities (other than securities to be sold by the Company) are first entirely excluded from the offering, or (ii) the

number of Registrable Securities included in the offering be reduced below thirty percent (30%) of the total number of securities included in such offering, unless such offering is the IPO, in which case the selling Holders may be excluded further if the underwriters make the determination described above and no other stockholder's securities are included in such offering. For purposes of the provision in this Section 2.3(b) concerning apportionment, for any selling Holder that is a partnership, limited liability company, or corporation, the partners, members, retired partners, retired members, stockholders, and Affiliates of such Holder, or the estates and Immediate Family Members of any such partners, retired partners, members, and retired members and any trusts for the benefit of any of the foregoing Persons, shall be deemed to be a single "selling Holder," and any pro rata reduction with respect to such "selling Holder" shall be based upon the aggregate number of Registrable Securities owned by all Persons included in such "selling Holder," as defined in this sentence.

(c) For purposes of Section 2.1, a registration shall not be counted as "effected" if, as a result of an exercise of the underwriter's cutback provisions in Section 2.3(a) and (b), less than the total number of Registrable Securities that Holders have requested to be included in such registration statement are actually included.

2.4 Obligations of the Company.

Whenever required under this Section 2 to effect the registration of any Registrable Securities, the Company shall, as expeditiously as reasonably possible:

(a) prepare and file with the SEC a registration statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such registration statement to become effective and, upon the request of the Holders of a majority of the Registrable Securities registered thereunder, keep such registration statement effective for a period of up to one hundred twenty (120) days or, if earlier, until the distribution contemplated in the registration statement has been completed; provided, however, that (i) such one hundred twenty (120) day period shall be extended for a period of time equal to the period the Holder refrains, at the request of an underwriter of the Company, from selling any securities included in such registration, and (ii) in the case of any registration of Registrable Securities on Form S-3 that are intended to be offered on a continuous or delayed basis, subject to compliance with applicable SEC rules, such one hundred twenty (120) day period shall be extended for up to one hundred eighty (180) days, if necessary, to keep the registration statement effective until all such Registrable Securities are sold;

(b) prepare and file with the SEC such amendments and supplements to such registration statement, and the prospectus used in connection with such registration statement, as may be necessary to comply with the Securities Act in order to enable the disposition of all securities covered by such registration statement;

(c) furnish to the selling Holders such numbers of copies of a prospectus, including a preliminary prospectus, as required by the Securities Act, and such other documents as the Holders may reasonably request in order to facilitate their disposition of their Registrable Securities;

(d) use its commercially reasonable efforts to register and qualify the securities covered by such registration statement under such other securities or blue-sky laws of such jurisdictions as shall be reasonably requested by the selling Holders; provided that the Company shall not be required to qualify to do business or to file a general consent to service of process in any such states or jurisdictions, unless the Company is already subject to service in such jurisdiction and except as may be required by the Securities Act;

(e) in the event of any underwritten public offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the underwriter(s) of such offering;

(f) use its commercially reasonable efforts to cause all such Registrable Securities covered by such registration statement to be listed on a national securities exchange or trading system and each securities exchange and trading system (if any) on which similar securities issued by the Company are then listed;

(g) provide a transfer agent and registrar for all Registrable Securities registered pursuant to this Agreement and provide a CUSIP number for all such Registrable Securities, in each case not later than the effective date of such registration;

(h) promptly make available for inspection by the selling Holders, any underwriter(s) participating in any disposition pursuant to such registration statement, and any attorney or accountant or other agent retained by any such underwriter or selected by the selling Holders, all financial and other records, pertinent corporate documents, and properties of the Company, and cause the Company's officers, directors, employees, and independent accountants to supply all information reasonably requested by any such seller, underwriter, attorney, accountant, or agent, in each case, as necessary or advisable to verify the accuracy of the information in such registration statement and to conduct appropriate due diligence in connection therewith;

(i) notify each selling Holder, promptly after the Company receives notice thereof, of the time when such registration statement has been declared effective or a supplement to any prospectus forming a part of such registration statement has been filed; and

(j) after such registration statement becomes effective, notify each selling Holder of any request by the SEC that the Company amend or supplement such registration statement or prospectus.

2.5 Furnish Information. It shall be a condition precedent to the obligations of the Company to take any action pursuant to this Section 2 with respect to the Registrable Securities of any selling Holder that such Holder shall furnish to the Company such information regarding itself, the Registrable Securities held by it, and the intended method of disposition of such securities as is reasonably required to effect the registration of such Holder's Registrable Securities.

2.6 Expenses of Registration. All expenses (other than Selling Expenses) incurred in connection with registrations, filings, or qualifications pursuant to Section 2, including all registration, filing, and qualification fees; printers' and accounting fees; fees and disbursements of counsel for the Company; and the reasonable fees and disbursements, not to exceed $60,000, of one counsel for the selling Holders ("**Selling Holder Counsel**") selected by the Holders of a majority in interest of the Registrable Securities, shall be borne and paid by the Company; provided, however, that the Company shall not be required to pay for any expenses of any registration proceeding begun pursuant to Section 2.1 if the registration request is subsequently withdrawn at the request of the Holders of a majority in interest of the Registrable Securities to be registered (in which case all selling Holders shall bear such expenses pro rata based upon the number of Registrable Securities that were to be included in the withdrawn registration), unless the Holders of a majority of the Registrable Securities agree to forfeit their right to one registration pursuant to Section 2.1(a) or Section 2.1(b), as the case may be; provided further that if, at the time of such withdrawal, the Holders have learned of a material adverse change in the condition, business, or prospects of the Company from that known to the Holders at the time of their request and have withdrawn the request with reasonable promptness after learning of such information, then the Holders shall not be required to pay any of such expenses and shall not forfeit their right to one registration pursuant to Section 2.1(a) or Section 2.1(b), as the case may be. All Selling Expenses relating to Registrable Securities registered pursuant to this Section 2 shall be borne and paid by the Holders pro rata on the basis of the number of Registrable Securities registered on their behalf.

2.7 Delay of Registration. No Holder shall have any right to obtain or seek an injunction restraining or otherwise delaying any registration pursuant to this Agreement as the result of any controversy that might arise with respect to the interpretation or implementation of this Section 2.

2.8 Indemnification. If any Registrable Securities are included in a registration statement under this Section 2:

(a) To the extent permitted by law, the Company will indemnify and hold harmless each selling Holder, and the partners, members, officers, directors, and stockholders of each such Holder; legal counsel and accountants for each such Holder; any underwriter (as defined in the Securities Act) for each such Holder; and each Person, if any, who controls such Holder or underwriter within the meaning of the Securities Act or the Exchange Act, against any Damages, and the Company will pay to each such Holder, underwriter, controlling Person, or other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 2.8(a) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Company, which consent shall not be unreasonably withheld, nor shall the Company be liable for any Damages to the extent that they arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of any such Holder, underwriter, controlling Person, or other aforementioned Person expressly for use in connection with such registration.

(b) To the extent permitted by law, each selling Holder, severally and not jointly, will indemnify and hold harmless the Company, and each of its directors, each of its officers who has signed the registration statement, each Person (if any), who controls the Company within the meaning of the Securities Act, legal counsel and accountants for the Company, any underwriter (as defined in the Securities Act), any other Holder selling securities in such registration statement, and any controlling Person of any such underwriter or other Holder, against any Damages, in each case only to the extent that such Damages arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of such selling Holder expressly for use in connection with such registration; and each such selling Holder will pay to the Company and each other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 2.8(b) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Holder, which consent shall not be unreasonably withheld; and provided further that in no event shall any indemnity or contribution under this Section 2.8(b) or under Section 2.8(d) exceed, in the aggregate, the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of fraud or willful misconduct by such Holder.

(c) Promptly after receipt by an indemnified party under this Section 2.8 of notice of the commencement of any action (including any governmental action) for which a party may be entitled to indemnification hereunder, such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Section 2.8, give the indemnifying party notice of the commencement thereof. The indemnifying party shall have the right to participate in such action and, to the extent the indemnifying party so desires, participate jointly with any other indemnifying party to which notice has been given, and to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party (together with all other indemnified parties that may be represented without conflict by one counsel) shall have the right to retain one separate counsel, with the fees and expenses to be paid by the indemnifying party, if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such action. The failure to give notice to the indemnifying party within a reasonable time of the commencement of any such action shall relieve such indemnifying party of any liability to the indemnified party under this Section 2.8, to the extent that such failure materially prejudices the indemnifying party's ability to defend such action. The failure to give notice to the indemnifying party will not relieve it of any liability that it may have to any indemnified party otherwise than under this Section 2.8.

(d) To provide for just and equitable contribution to joint liability under the Securities Act in any case in which either (i) any party otherwise entitled to indemnification hereunder makes a claim for indemnification pursuant to this Section 2.8 but it is judicially determined (by the entry of a final judgment or decree by a court of competent jurisdiction and the expiration of time to appeal or the denial of the last right of appeal) that such indemnification may not be enforced in such case, notwithstanding the fact that this Section 2.8 provides for indemnification in such case, or (ii) contribution under the Securities Act may be required on the part of any party hereto for which indemnification is provided under this Section 2.8, then, and in each such case, such parties will contribute to the aggregate losses,

claims, damages, liabilities, or expenses to which they may be subject (after contribution from others) in such proportion as is appropriate to reflect the relative fault of each of the indemnifying party and the indemnified party in connection with the statements, omissions, or other actions that resulted in such loss, claim, damage, liability, or expense, as well as to reflect any other relevant equitable considerations. The relative fault of the indemnifying party and of the indemnified party shall be determined by reference to, among other things, whether the untrue or allegedly untrue statement of a material fact, or the omission or alleged omission of a material fact, relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information, and opportunity to correct or prevent such statement or omission; provided, however, that, in any such case, (x) no Holder will be required to contribute any amount in excess of the public offering price of all such Registrable Securities offered and sold by such Holder pursuant to such registration statement, and (y) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation; and provided further that in no event shall a Holder's liability pursuant to this Section 2.8(d), when combined with the amounts paid or payable by such Holder pursuant to Section 2.8(b), exceed the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of willful misconduct or fraud by such Holder.

(e) Notwithstanding the foregoing, to the extent that the provisions on indemnification and contribution contained in the underwriting agreement entered into in connection with the underwritten public offering are in conflict with the foregoing provisions, the provisions in the underwriting agreement shall control.

(f) Unless otherwise superseded by an underwriting agreement entered into in connection with the underwritten public offering, the obligations of the Company and Holders under this Section 2.8 shall survive the completion of any offering of Registrable Securities in a registration under this Section 2, and otherwise shall survive the termination of this Agreement.

2.9 Reports under Exchange Act. With a view to making available to the Holders the benefits of SEC Rule 144 and any other rule or regulation of the SEC that may at any time permit a Holder to sell securities of the Company to the public without registration or pursuant to a registration on Form S-3, the Company shall:

(a) make and keep available adequate current public information, as those terms are understood and defined in SEC Rule 144, at all times after the effective date of the registration statement filed by the Company for the IPO;

(b) use commercially reasonable efforts to file with the SEC in a timely manner all reports and other documents required of the Company under the Securities Act and the Exchange Act (at any time after the Company has become subject to such reporting requirements); and

(c) furnish to any Holder, so long as the Holder owns any Registrable Securities, forthwith upon request (i) to the extent accurate, a written statement by the Company that it has complied with the reporting requirements of SEC Rule 144 (at any time after ninety (90) days after the effective date of the registration statement filed by the Company for the IPO), the Securities Act, and the Exchange Act (at any time after the Company has become subject to such reporting requirements), or that it qualifies as a registrant whose securities may be resold pursuant to Form S-3 (at any time after the Company so qualifies); (ii) a copy of the most recent annual or quarterly report of the Company and such other reports and documents so filed by the Company; and (iii) such other information as may be reasonably requested in availing any Holder of any rule or regulation of the SEC that permits the selling of any such securities without registration (at any time after the Company has become subject to the reporting requirements under the Exchange Act) or pursuant to Form S-3 (at any time after the Company so qualifies to use such form).

2.10 Limitations on Subsequent Registration Rights. From and after the date of this Agreement, the Company shall not, without the prior written consent of the Holders of a majority in interest of the Registrable Securities then outstanding, enter into any agreement with any holder or prospective holder of any securities of the Company that would allow such holder or prospective holder (i) to include such securities in any registration unless, under the terms of such agreement, such holder or prospective holder may include such securities in any such registration only to the extent that the inclusion of such securities will not reduce the number of the Registrable Securities of the Holders that are included or (ii) to demand registration of any securities held by such holder or prospective holder; provided that this limitation shall not apply to any additional Investor who becomes a party to this Agreement in accordance with Section 6.9.

2.11 "Market Stand-off" Agreement.

Each Holder hereby agrees that, if required by the managing underwriter, it will not, during the period commencing on the date of the final prospectus relating to the IPO and ending on the date specified by the Company and the managing underwriter (such period not to exceed one hundred eighty (180) days), or such other period as may be requested by the Company or an underwriter to accommodate regulatory restrictions on (1) the publication or other distribution of research reports, and (2) analyst recommendations and opinions, including, but not limited to, the restrictions contained in FINRA Rule 2711(f)(4) or NYSE Rule 472(f)(4), or any successor provisions or amendments thereto) (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock held immediately before the effective date of the registration statement for such offering or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or other securities, in cash, or otherwise. The foregoing provisions of this Section 2.11 shall apply only to the IPO, shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, and shall be applicable to the Holders only if all officers, directors, and stockholders individually owning more than one percent (1%) of the Company's outstanding Common Stock (after giving effect to conversion into Common Stock of all outstanding Preferred Stock) are subject to the same restrictions. The underwriters in connection with such

registration are intended third-party beneficiaries of this Section 2.11 and shall have the right, power, and authority to enforce the provisions hereof as though they were a party hereto. Each Holder further agrees to execute such agreements as may be reasonably requested by the underwriters in connection with such registration that are consistent with this Section 2.11 or that are necessary to give further effect thereto. The Company agrees to use its reasonable efforts to obtain the agreement of the managing underwriter to periodic early releases of portions of the securities subject to such lock-up agreements upon the request of a Holder to such early release, provided that in the event of any early release, all Holders will be released on a pro rata basis from such agreements. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to all Holders subject to such agreements, based on the number of shares subject to such agreements.

2.12 Restrictions on Transfer.

(a) The Preferred Stock and the Registrable Securities shall not be sold, pledged, or otherwise transferred, and the Company shall not recognize any such sale, pledge, or transfer, except upon the conditions specified in this Agreement, which conditions are intended to ensure compliance with the provisions of the Securities Act. A transferring Holder will cause any proposed purchaser, pledgee, or transferee of the Preferred Stock or the Registrable Securities held by such Holder to agree to take and hold such securities subject to the provisions and upon the conditions specified in this Agreement.

(b) Each certificate or instrument representing (i) the Preferred Stock, (ii) the Registrable Securities, and (iii) any other securities issued in respect of the securities referenced in clauses (i) and (ii), upon any stock split, stock dividend, recapitalization, merger, consolidation, or similar event, shall (unless otherwise permitted by the provisions of Section 2.12(c)) be stamped or otherwise imprinted with a legend substantially in the following form:

> THE SECURITIES REPRESENTED HEREBY HAVE BEEN ACQUIRED FOR INVESTMENT AND HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. SUCH SHARES MAY NOT BE SOLD, PLEDGED, OR TRANSFERRED IN THE ABSENCE OF SUCH REGISTRATION OR A VALID EXEMPTION FROM THE REGISTRATION AND PROSPECTUS DELIVERY REQUIREMENTS OF SAID ACT.
>
> THE SECURITIES REPRESENTED HEREBY MAY BE TRANSFERRED ONLY IN ACCORDANCE WITH THE TERMS OF AN AGREEMENT BETWEEN THE COMPANY AND THE STOCKHOLDER, A COPY OF WHICH IS ON FILE WITH THE SECRETARY OF THE COMPANY.

The Holders consent to the Company making a notation in its records and giving instructions to any transfer agent of the Restricted Securities in order to implement the restrictions on transfer set forth in this Section 2.12.

(c) The holder of each certificate or instrument representing Restricted Securities, by acceptance thereof, agrees to comply in all respects with the provisions of this Section 2. Before any proposed sale, pledge, or transfer of any Restricted Securities, unless there is in effect a registration statement under the Securities Act covering the proposed transaction, the Holder thereof shall give notice to the Company of such Holder's intention to effect such sale, pledge, or transfer. Each such notice shall describe the manner and circumstances of the proposed sale, pledge, or transfer in sufficient detail and, if reasonably requested by the Company, shall be accompanied at such Holder's expense by either (i) a written opinion of legal counsel who shall, and whose legal opinion shall, be reasonably satisfactory to the Company, addressed to the Company, to the effect that the proposed transaction may be effected without registration under the Securities Act; (ii) a "no action" letter from the SEC to the effect that the proposed sale, pledge, or transfer of such Restricted Securities without registration will not result in a recommendation by the staff of the SEC that action be taken with respect thereto; or (iii) any other evidence reasonably satisfactory to counsel to the Company to the effect that the proposed sale, pledge, or transfer of the Restricted Securities may be effected without registration under the Securities Act, whereupon the Holder of such Restricted Securities shall be entitled to sell, pledge, or transfer such Restricted Securities in accordance with the terms of the notice given by the Holder to the Company. The Company will not require such a legal opinion or "no action" letter (x) in any transaction in which such Holder distributes Restricted Securities to an Affiliate of such Holder for no consideration provided that each transferee agrees in writing to be subject to the terms of this Section 2.12 or (y) in any transaction in compliance with SEC Rule 144. Each certificate or instrument evidencing the Restricted Securities transferred as above provided shall bear, except if such transfer is made pursuant to SEC Rule 144, the appropriate restrictive legend set forth in Section 2.12(b), except that such certificate shall not bear such restrictive legend if, in the opinion of counsel for such Holder and the Company, such legend is not required in order to establish compliance with any provisions of the Securities Act.

2.13 Termination of Registration Rights. The right of any Holder to request registration or inclusion of Registrable Securities in any registration pursuant to Section 2.1 or Section 2.2 shall terminate upon the earliest to occur of:

(a) the closing of a Deemed Liquidation Event, as such term is defined in the Certificate of Incorporation;

(b) such time as Rule 144 or another similar exemption under the Securities Act is available for the sale of all of such Holder's shares without limitation during a three-month period without registration; and

(c) the fifth (5^{th}) anniversary of the IPO.

3. Information.

3.1 Delivery of Financial Statements. The Company shall deliver to each Major Investor the required items listed below, provided that the Board of Directors has not reasonably determined that such Major Investor is a Competitor of the Company.

(a) as soon as practicable, but in any event within one hundred twenty (120) days after the end of each fiscal year of the Company, (i) a balance sheet as of the end of such year, (ii) statements of income and of cash flows for such year, and (iii) a statement of stockholders' equity as of the end of such year, all such financial statements audited and certified by independent public accountants of nationally or regionally recognized standing selected by the Company and approved by the Board of Directors;

(b) as soon as practicable but in any event within forty-five (45) days after the end of each quarter of each fiscal year of the Company, unaudited statements of income and of cash flows for such fiscal quarter, and an unaudited balance sheet and a statement of stockholders' equity as of the end of such fiscal quarter, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end audit adjustments and (ii) not contain all notes thereto that may be required in accordance with GAAP);

(c) as soon as practicable, but in any event within thirty (30) days after the end of each month, an unaudited income statement and statement of cash flows for such month, and an unaudited balance sheet and statement of stockholders' equity as of the end of such month, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end audit adjustments and (ii) not contain all notes thereto that may be required in accordance with GAAP);

(d) as soon as practicable, but in any event within forty-five (45) days after the end of each quarter of each fiscal year of the Company, a statement showing the number of shares of each class and series of capital stock and securities convertible into or exercisable for shares of capital stock outstanding at the end of the period, the Common Stock issuable upon conversion or exercise of any outstanding securities convertible or exercisable for Common Stock and the exchange ratio or exercise price applicable thereto, and the number of shares of issued stock options and stock options not yet issued but reserved for issuance, if any, all in sufficient detail as to permit each Major Investor to calculate their respective percentage equity ownership in the Company, and certified by the chief financial officer or chief executive officer of the Company as being true, complete, and correct;

(e) as soon as practicable, but in any event thirty (30) days before the end of each fiscal year, a budget and business plan for the next fiscal year (collectively, the "**Budget**"), approved by the Board of Directors and prepared on a monthly basis, including balance sheets, income statements, and statements of cash flow for such months and, promptly after prepared, any other budgets or revised budgets prepared by the Company; and

(f) such other information relating to the financial condition, business, prospects, or corporate affairs of the Company as any Major Investor may from time to time reasonably request; provided, however, that the Company shall not be obligated under this Section 3.1 to provide information (i) that the Company reasonably determines in good faith to be a trade secret or highly confidential information (unless covered by an enforceable confidentiality agreement, in a form acceptable to the Company); or (ii) the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

If, for any period, the Company has any subsidiary whose accounts are consolidated with those of the Company, then in respect of such period the financial statements delivered pursuant to the foregoing sections shall be the consolidated and consolidating financial statements of the Company and all such consolidated subsidiaries. The Company shall start delivering the financial statements called for by Sections 3.1(b), (c) and (d), beginning no later than the quarter ending March 31, 2017.

Notwithstanding anything else in this Section 3.1 to the contrary, the Company may cease providing the information set forth in this Section 3.1 during the period starting with the date thirty (30) days before the Company's good-faith estimate of the date of filing of a registration statement if it reasonably concludes it must do so to comply with the SEC rules applicable to such registration statement and related offering; provided that the Company's covenants under this Section 3.1 shall be reinstated at such time as the Company is no longer actively employing its commercially reasonable efforts to cause such registration statement to become effective.

3.2 Inspection. The Company shall permit each Major Investor (provided that such Major Investor is not a Competitor of the Company as reasonably determined by the Board of Directors), at such Major Investor's expense, to visit and inspect the Company's properties; examine its books of account and records; and discuss the Company's affairs, finances, and accounts with its officers, during normal business hours of the Company as may be reasonably requested by the Major Investor; provided, however, that the Company shall not be obligated pursuant to this Section 3.2 to provide access to any information that it reasonably and in good faith considers to be a trade secret or confidential information (unless covered by an enforceable confidentiality agreement, in a form acceptable to the Company); or the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

3.3 Termination of Information Rights. The covenants set forth in Sections 3.1 and 3.2 shall terminate and be of no further force or effect upon the earliest to occur of (i) immediately before, but subject to, the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, or (iii) upon a Deemed Liquidation Event resulting in proceeds to the Investors paid solely in cash or publicly traded securities on a nationally recognized securities exchange or marketplace (e.g., the New York Stock Exchange and the Nasdaq Stock Market).

3.4 Confidentiality. Each Investor agrees that such Investor will keep confidential and will not disclose, divulge, or use for any purpose (other than to monitor its investment in the Company) any confidential information obtained from the Company pursuant to the terms of this Agreement (including notice of the Company's intention to file a registration statement), unless such confidential information (a) is known or becomes known to the public in general (other than as a result of a breach of this Section 3.4 by such Investor), (b) is or has been independently developed or conceived by the Investor without use of the Company's confidential information, or (c) is or has been made known or disclosed to the Investor by a third party without a breach of any obligation of confidentiality such third party may have to the Company; provided, however, that an Investor may disclose confidential information (i) to its attorneys, accountants, consultants, advisors and other professionals (collectively, "**Representatives**") to the extent necessary to obtain their services in connection with monitoring its investment in the Company; (ii) to any prospective purchaser of any Registrable Securities from such Investor, if such prospective purchaser agrees to be bound by the provisions of this Section 3.4; (iii) in the ordinary course of business to any existing or prospective, direct or indirect, Affiliate, partner, member, stockholder, or wholly owned subsidiary of such Investor and any Representatives, employees or Affiliates of any of the foregoing, provided that such Investor informs any such

recipient that such information is confidential and directs such recipient to maintain the confidentiality of such information (each of the foregoing Persons, a "**Permitted Disclosee**"); or (iv) as may otherwise be required by law or securities exchange regulations or at the request of a regulatory authority, provided that the Investor promptly notifies the Company of such disclosure and takes reasonable steps to minimize the extent of any such required disclosure. Furthermore, nothing contained herein shall prevent any Investor or any Permitted Disclosee from entering into any business, entering into any agreement with a third party, or investing in or engaging in investment discussions with any other company (whether or not competitive with the Company), provided that such Investor or Permitted Disclosee does not, except as permitted in accordance with this Section 3.4, disclose any proprietary or confidential information of the Company in connection with such activities; and provided further, each Investor may identify the Company and the value of such Investor's security holdings in the Company in accordance with applicable investment reporting and disclosure regulations or internal policies and respond to routine examinations, demands, requests or reporting requirements of any regulator without prior notice to or consent from the Company.

4. Rights to Future Stock Issuances.

4.1 Right of First Offer. Subject to the terms and conditions of this Section 4.1 and applicable securities laws, if the Company proposes to offer or sell any New Securities, the Company shall first offer such New Securities to each Major Investor, provided that the Board of Directors has not reasonably determined that such Major Investor is a Competitor of the Company. A Major Investor shall be entitled to apportion the right of first offer hereby granted to it among itself and its Affiliates in such proportions as it deems appropriate, provided that each such Affiliate (x) is not a Competitor of the Company as reasonably determined by the Board of Directors, and (y) agrees to enter into this Agreement and the Stockholders Agreement of even date herewith among the Company, the Investors and the other parties named therein, as an "Investor" under each such agreement.

(a) The Company shall give notice (the "**Offer Notice**") to each Major Investor, stating (i) its bona fide intention to offer such New Securities, (ii) the number of such New Securities to be offered, and (iii) the price and terms, if any, upon which it proposes to offer such New Securities.

(b) By notification to the Company within twenty (20) days after the Offer Notice is given, each Major Investor may elect to purchase or otherwise acquire, at the price and on the terms specified in the Offer Notice, up to that portion of such New Securities which equals the proportion that the Common Stock then held by such Major Investor (including all shares of Common Stock then issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held by such Major Investor) bears to the total number of shares of Common Stock of the Company then outstanding (assuming full conversion and/or exercise, as applicable, of all Preferred Stock and other Derivative Securities). At the expiration of such twenty (20) day period, the Company shall promptly notify each Major Investor that elects to purchase or acquire all the shares available to it (each, a "**Fully Exercising Investor**") of any other Major Investor's failure to do likewise. During the ten (10) day period commencing after the Company has given such notice, each Fully Exercising Investor may, by giving notice to the Company, elect to purchase or acquire, in

addition to the number of shares specified above, up to that portion of the New Securities for which such Major Investors were entitled to subscribe, but that were not subscribed for by the Major Investors, which is equal to the proportion that the Common Stock issued and held, or issuable upon conversion of Preferred Stock and any other Derivative Securities then held, by such Fully Exercising Investor bears to the number of shares of Common Stock issued and held, or issuable (directly or indirectly) upon conversion of the Preferred Stock and any other Derivative Securities then held, by all Fully Exercising Investors who wish to purchase such unsubscribed shares. The closing of any sale pursuant to this Section 4.1(b) shall occur within the later of one hundred twenty (120**)** days after the date that the Offer Notice is given and the date of initial sale of New Securities pursuant to Section 4.1(c).

(c) If fewer than all New Securities referred to in the Offer Notice are elected to be purchased or acquired as provided in Section 4.1(b), the Company may, during the ninety (90) day period following the expiration of the periods provided in Section 4.1(b), offer and sell the remaining unsubscribed portion of such New Securities to any Person or Persons at a price not less than, and upon terms no more favorable to the offeree than, those specified in the Offer Notice. If the Company does not enter into an agreement for the sale of the New Securities within such period, or if such agreement is not consummated within thirty (30) days of the execution thereof, the right provided hereunder shall be deemed to be revived and such New Securities shall not be offered unless first reoffered to the Major Investors in accordance with this Section 4.1.

(d) The right of first offer in this Section 4.1 shall not be applicable to (i) Exempted Securities (as defined in the Certificate of Incorporation), (ii) any shares of Series B Preferred Stock sold pursuant to the Purchase Agreement, and (iii) shares of Common Stock issued in the IPO.

(e) The rights of the Major Investors to purchase New Securities under this Section 4.1 may be modified or waived in accordance with Section 6.6; provided, however, that in the event such rights to purchase New Securities under this Section 4.1 are waived and any Major Investor(s) purchase New Securities, the Company shall give notice to the other Major Investors within thirty (30) days after the initial issuance of New Securities. Such notice shall describe the type, price, and terms of the New Securities. Each such other Major Investor shall have twenty (20) days from the date such notice is given to elect to purchase on similar terms and conditions in a subsequent closing up to the number of New Securities that would, if purchased by such Major Investor, maintain such Major Investor's percentage-ownership position, calculated as set forth in Section 4.1(b) before giving effect to the issuance of such New Securities.

4.2 Termination. The covenants set forth in Section 4.1 shall terminate and be of no further force or effect upon the earliest to occur of (i) immediately before, but subject to, the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act with its Common Stock listed on the NYSE or NASDAQ or (iii) upon a Deemed Liquidation Event.

5. Additional Covenants.

5.1 Insurance. The Company has obtained, or shall obtain within 90 days of the date of this Agreement, from financially sound and reputable insurers Directors and Officers Errors and Omissions insurance in an amount satisfactory to the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and will use commercially reasonable efforts to cause such insurance policy to be maintained until such time as the Board of Directors (including the affirmative vote of all of the Preferred Directors then serving on the Board of Directors) determines that such insurance should be discontinued.

5.2 Employee Agreements. The Company will cause (a) each individual now or hereafter employed by it or by any subsidiary (or engaged by the Company or any subsidiary as an individual consultant/independent contractor) with access to confidential information and/or trade secrets to enter into a nondisclosure and proprietary rights assignment agreement and (b) each Key Employee or Intellectual Property Employee (as defined in the Purchase Agreement) to enter into a one (1) year noncompetition and nonsolicitation agreement, substantially in the form approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors. In addition, the Company shall not amend, modify, terminate, waive, or otherwise alter, in whole or in part, any of the above-referenced agreements or any restricted stock agreement between the Company and any employee, without the approval by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

5.3 Employee Vesting. Unless otherwise approved by the Board of Directors, which approval shall include a majority of the Preferred Directors then serving on the Board of Directors, all current and future employees and consultants of the Company who purchase, receive options to purchase, or receive awards of shares of the Company's capital stock after the date hereof shall be required to execute restricted stock or option agreements, as applicable, providing for (a) vesting of shares, not faster than over a four (4) year period, with the first twenty-five percent (25%) of such shares vesting following twelve (12) months of continued employment or service, and the remaining shares vesting in equal quarterly installments over the following three (3) years, and (b) a market stand-off provision substantially similar to that in Section 2.11. In addition, unless otherwise approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, the Company shall retain a "right of first refusal" on employee transfers of shares of Common Stock until the Company's IPO and shall have the right to repurchase unvested shares at cost upon termination of employment of a holder of restricted stock.

5.4 Matters Requiring Investor Director Approval. So long as any shares of Preferred Stock remain outstanding, the Company hereby covenants and agrees with each of the Investors that it shall not, without first obtaining the approval of the Board of Directors, which approval must include the affirmative vote of a majority of the Preferred Directors then serving on the Board of Directors:

(a) make, or permit any subsidiary to make, any loan or advance to, or own any stock or other securities of, any subsidiary or other corporation, partnership, or other entity unless it is wholly owned by the Company;

(b) create any subsidiary;

(c) make, or permit any subsidiary to make, any loan or advance to any Person, including, without limitation, any employee or director of the Company or any subsidiary, except advances and similar expenditures in the ordinary course of business or under the terms of an employee stock or option plan approved by the Board of Directors;

(d) guarantee, directly or indirectly, or permit any subsidiary to guarantee, directly or indirectly, any indebtedness except for trade accounts of the Company or any subsidiary arising in the ordinary course of business;

(e) make any investment inconsistent with any investment policy approved by the Board of Directors;

(f) incur indebtedness in excess of $200,000 in the aggregate that is not covered by the Budget, other than trade credit incurred in the ordinary course of business;

(g) otherwise enter into or be a party to any transaction with any director, officer or employee of the Company or any "associate" (as defined in Rule 12b-2 promulgated under the Exchange Act) of any such Person;

(h) hire, terminate, or change the compensation of the executive officers, including approving any option grants or stock awards to executive officers; or

(i) change the principal business of the Company, or enter into a new line of business, or exit the existing line of business of the Company.

5.5 Meetings of the Board of Directors; Committees. Unless otherwise determined by the vote of at least a majority of the directors then in office, the Board of Directors shall meet at least four (4) times per year, and at least once per quarter, in accordance with an agreed-upon schedule. Each non-employee director shall be entitled in such person's discretion to be a member of any committee of the Board of Directors.

5.6 Successor Indemnification. If the Company or any of its successors or assignees consolidates with or merges into any other Person and is not the continuing or surviving corporation or entity of such consolidation or merger, then to the extent necessary, proper provision shall be made so that the successors and assignees of the Company assume the obligations of the Company with respect to indemnification of members of the Board of Directors as in effect immediately before such transaction, whether such obligations are contained in the Company's By-laws, the Certificate of Incorporation, or elsewhere, as the case may be.

5.7 Board Expenses. The Company shall reimburse the non-employee directors for all reasonable out-of-pocket expenses incurred (consistent with the Company's policies) in connection with their role as a director of the Company.

5.8 Directors' Liability and Indemnification.

(a) The Certificate of Incorporation and By-laws (as such By-laws of the Company may be amended from time to time) shall provide (i) for limitation of the liability of directors to the maximum extent permitted by law, and (ii) for indemnification of directors for acts on behalf of the Company to the maximum extent permitted by law. In the event any suit is filed or claim is asserted against a director or former director of the Company as a result of such director's or former director's service on the Board of Directors, the Company will provide such director or former director access to all records and files of the Company as he or she may reasonably request in defending against or preparing to defend against any such suit or claim.

(b) The Company hereby acknowledges that one or more of the Preferred Directors may have certain rights to indemnification, advancement of expenses and/or insurance provided by one or more of the Investors and certain of their Affiliates (collectively, the "**Fund Indemnitors**") for alleged acts or omissions in their capacities as directors of the Company. The Company hereby agrees (i) that it is the indemnitor of first resort (i.e., its obligations to any such director are primary and any obligation of the Fund Indemnitors to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such director are secondary), (ii) that it shall be required to advance the full amount of expenses incurred by such director and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement by or on behalf of any such director to the extent legally permitted and as required by the Certificate of Incorporation or By-laws of the Company (or any agreement between the Company and such director), without regard to any rights such director may have against the Fund Indemnitors, and, (iii) that it irrevocably waives, relinquishes and releases the Fund Indemnitors from any and all claims against the Fund Indemnitors for contribution, subrogation or any other recovery of any kind in respect thereof. The Company further agrees that no advancement or payment by the Fund Indemnitors on behalf of any such director with respect to any claim for which such director has sought indemnification from the Company shall affect the foregoing and the Fund Indemnitors shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such director against the Company.

5.9 Right to Conduct Activities. The Company hereby agrees and acknowledges that each of Third Rock Ventures IV, L.P., Atlas Venture Fund X, L.P., GV 2016, L.P., Partners Innovation Fund LLC, Be The Match BioTherapies, LLC and Access Industries Holdings LLC (in each case, together with its Affiliates) (each, an "**Investing Entity**") invests in or may hereafter invest in one or more other portfolio companies ("**PortCos**"), some of which may be deemed competitive with the Company's business (as currently conducted or as currently proposed to be conducted). The Company hereby agrees that (a) no Investing Entity shall be deemed to be a Competitor of the Company in respect of any investment such Investing Entity makes in any PortCo, and (b) to the extent permitted under applicable law, no Investing Entity shall be liable to the Company for any claim arising out of, or based upon, (i) the investment by such Investing Entity in any entity competitive with the Company, or (ii) actions taken by any partner, officer or other representative of such Investing Entity to assist any such competitive company, whether or not such action was taken as a member of the board of directors of such competitive company or otherwise, and whether or not such action has a detrimental effect on the Company; provided, however, that the foregoing shall not relieve (x) any of the Investors from liability associated with the unauthorized disclosure of the Company's confidential information obtained pursuant to this Agreement, or (y) any director or officer of the Company from any liability associated with his or her fiduciary duties to the Company.

5.10 Termination of Covenants. The covenants set forth in this Section 5, except for Sections 5.6 and 5.8, shall terminate and be of no further force or effect upon the earliest to occur of (i) immediately before but subject to the consummation of a QPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act with its Common Stock listed on the NYSE or NASDAQ, or (iii) upon a Deemed Liquidation Event.

6. Miscellaneous.

6.1 Successors and Assigns. The rights under this Agreement may be assigned (but only with all related obligations) by a Holder to a transferee of Registrable Securities that (i) is an Affiliate, member, retired partner, retired member or stockholder of a Holder; (ii) is a Holder's Immediate Family Member or trust for the benefit of an individual Holder or one or more of such Holder's Immediate Family Members; or (iii) after such transfer, holds at least 50,000 shares of Registrable Securities (subject to appropriate adjustment for stock splits, stock dividends, combinations, and other recapitalizations); provided, however, that (x) the Company is, within a reasonable time after such transfer, furnished with written notice of the name and address of such transferee and the Registrable Securities with respect to which such rights are being transferred; and (y) such transferee agrees in a written instrument delivered to the Company to be bound by and subject to the terms and conditions of this Agreement, including the provisions of Section 2.11. For the purposes of determining the number of shares of Registrable Securities held by a transferee, the holdings of a transferee (1) that is an Affiliate, limited partner, retired partner, member, retired member, or stockholder of a Holder; (2) who is a Holder's Immediate Family Member; or (3) that is a trust for the benefit of an individual Holder or such Holder's Immediate Family Member shall be aggregated together and with those of the transferring Holder and its Affiliates; provided further that all transferees who would not qualify individually for assignment of rights shall have a single attorney-in-fact for the purpose of exercising any rights, receiving notices, or taking any action under this Agreement. The terms and conditions of this Agreement inure to the benefit of and are binding upon the respective successors and permitted assignees of the parties, including without limitation, the Investor's Affiliates. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and permitted assignees any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided herein.

6.2 Governing Law. This Agreement shall be governed by and construed in accordance with the internal laws of the State of Delaware, without regard to conflict of law principles that would result in the application of any law other than the law of the State of Delaware.

6.3 Counterparts; Facsimile. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may also be executed and delivered by facsimile signature, email signature, or other form of electronic transmission.

6.4 Titles and Subtitles. The titles and subtitles used in this Agreement are for convenience only and are not to be considered in construing or interpreting this Agreement.

6.5 Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified; (b) when sent, if sent by confirmed electronic mail or facsimile and sent during normal business hours of the recipient, and if not so confirmed, then on the next Business Day; (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid; or (d) one (1) Business Day after the Business Day of deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their addresses as set forth on Schedule A hereto, or to the principal office of the Company and to the attention of the Chief Executive Officer, in the case of the Company, or to such email address, facsimile number, or address as subsequently modified by written notice given in accordance with this Section 6.5. If notice is given to the Company, a copy, which shall not constitute notice, shall also be sent to Mitchell S. Bloom and William D. Collins at Goodwin Procter LLP, 100 Northern Avenue, Boston, MA 02210.

6.6 Amendments and Waivers. Any term of this Agreement may be amended and the observance of any term of this Agreement may be waived (either generally or in a particular instance, and either retroactively or prospectively) only with the written consent of the Company and the holders of at least a majority of the Registrable Securities then outstanding; provided that the Company may in its sole discretion waive compliance with Section 2.12(c) (and the Company's failure to object promptly in writing after notification of a proposed assignment allegedly in violation of Section 2.12(c) shall be deemed to be a waiver); and provided further that any provision hereof may be waived by any waiving party on such party's own behalf, without the consent of any other party. Notwithstanding the foregoing, (i) this Agreement may not be amended or terminated and the observance of any term hereof may not be waived with respect to any Investor without the written consent of such Investor, unless such amendment, termination, or waiver applies to all Investors in the same fashion, (ii) any waiver of the provisions of Section 4 shall be effective only if all Major Investors that have rights under Section 4 are provided the opportunity to participate in such offering to the same extent (on a percentage basis) of their pro rata share and on similar terms as the other Major Investors who are participating in such offering (including, but not limited to, through a rights offering completed in accordance with the procedures set forth in Section 4.1(e)), and (iii) the provisions of Section 3 and Section 4 may be amended and the observance of any term thereof may be waived (either generally or in a particular instance and either retroactively or prospectively) only with the written consent of the Major Investors holding at least a majority of the Registrable Securities then held by all Major Investors. The Company shall give prompt notice of any amendment or termination hereof or waiver hereunder to any party hereto that did not consent in writing to such amendment, termination, or waiver. Any amendment, termination, or waiver effected in accordance with this Section 6.6 shall be binding on all parties hereto, regardless of whether any such party has consented thereto. No waivers of or exceptions to any term, condition, or provision of this Agreement, in any one or more instances, shall be deemed to be or construed as a further or continuing waiver of any such term, condition, or provision.

6.7 Severability. In case any one or more of the provisions contained in this Agreement is for any reason held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision of this Agreement, and such invalid, illegal, or unenforceable provision shall be reformed and construed so that it will be valid, legal, and enforceable to the maximum extent permitted by law.

6.8 Aggregation of Stock. All shares of Registrable Securities held or acquired by Affiliates shall be aggregated together for the purpose of determining the availability of any rights under this Agreement and such Affiliated Person may apportion such rights as among themselves in any manner they deem appropriate.

6.9 Additional Investors. Notwithstanding anything to the contrary contained herein, if after the date hereof the Company issues additional shares of the Preferred Stock to a Person who is not already a party to this Agreement (any such person, a "**New Investor**"), as a condition to the issuance of such shares the Company shall require that such New Investor become a party to this Agreement by executing and delivering a counterpart signature page or joinder agreement to this Agreement, and thereafter shall be deemed an "Investor" for all purposes hereunder. No action or consent by the Investors shall be required for such joinder to this Agreement by such additional Investor, so long as such additional Investor has agreed in writing to be bound by all of the obligations as an "Investor" hereunder. Schedule A to this Agreement shall be updated, as applicable, to reflect the issuance of Preferred Stock and Common Stock, respectively, to a New Investor.

6.10 Entire Agreement. Upon effectiveness of this Agreement, the Prior Agreement shall be deemed amended and restated to read in its entirety as set forth in this Agreement. This Agreement (including the Schedules and Exhibits hereto) constitutes the full and entire understanding and agreement between the parties with respect to the subject matter hereof, and any other written or oral agreement relating to the subject matter hereof existing between the parties (including the Prior Agreement) are expressly canceled.

6.11 Delays or Omissions. Except as set forth in Section 2.1(c) (with respect to the Company's failure to object promptly to a transfer), no delay or omission to exercise any right, power, or remedy accruing to any party under this Agreement, upon any breach or default of any other party under this Agreement, shall impair any such right, power, or remedy of such nonbreaching or nondefaulting party, nor shall it be construed to be a waiver of or acquiescence to any such breach or default, or to any similar breach or default thereafter occurring, nor shall any waiver of any single breach or default be deemed a waiver of any other breach or default theretofore or thereafter occurring. All remedies, whether under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

6.12 Submission to Jurisdiction. The parties hereto submit to the exclusive jurisdiction of any federal or state court located within the Commonwealth of Massachusetts over any dispute arising out of or relating to the Agreement or any of the transactions contemplated hereby and each party hereby agree that all claims in respect of such dispute or any

suit, action or proceeding related thereto may be heard and determined in such courts. The parties waive, to the fullest extent permitted by applicable law, any objection which they may not or hereafter have to the laying of venue of any such dispute brought in such court or any defense of inconvenient forum for the maintenance of such dispute. Each of the parties hereto agrees that a judgment in any such dispute may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by law.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

COMPANY:

MAGENTA THERAPEUTICS, INC.

By: /s/ Jason Gardner
Name: Jason Gardner
Title: President and Chief Executive Officer

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

THIRD ROCK VENTURES IV, L.P.

By: Third Rock Ventures GP IV, L.P., its general partner
By: TRV GP IV, LLC, its general partner

By: /s/ Kevin Gillis
Name: Kevin Gillis
Title: CFO/Partner

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

ATLAS VENTURE FUND X, L.P.

By: Atlas Venture Associates X, L.P.
Its General Partner

By: Atlas Venture Associates X, LLC
Its General Partner

By: /s/ Ommer Chohan
Name: Ommer Chohan
Title: CFO

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

GV 2016, L.P.

By: GV 2016 GP, L.P., its General Partner
By: GV 2016 GP, L.L.C., its General Partner

By: /s/ Jennifer L. Kercher
Name: Jennifer L. Kercher
Title: Authorized Signatory

Email: notice@gv.com

Attn: Jennifer L. Kercher
c/o GV
1600 Amphitheatre Parkway
Mountain View, CA 94043

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

BE THE MATCH BIOTHERAPIES, LLC

By: /s/ Amy Ronneberg
Name: Amy Ronneberg
Title: President

Address: 500 N. 5th Street
Minneapolis, Minnesota 55401-1206

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

ACCESS INDUSTRIES HOLDINGS LLC

By: Access Industries Management, LLC,
Its Manager

By: /s/ Richard B. Storey
Name: Richard B. Storey
Title: Executive Vice President

Address: Access Industries Holdings LLC
c/o Access Industries Management, LLC
730 Fifth Avenue, 20th Floor
New York, NY 10019
Email: legalnotices@accind.com
Attn: Legal Department

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

PARTNERS INNOVATION FUND LLC

By: /s/ Meredith Fisher
Name: Meredith Fisher
Title: Partner, Innovation Fund

Address: 215 First Street, 5th Floor
Cambridge, MA 02142

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ David Scadden
Name: David Scadden

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Derrick Rossi
Name: Derrick Rossi

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Jason Gardner
Name: Jason Gardner

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Bastiano Sanna
Name: Bastiano Sanna

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Michael Cooke
Name: Michael Cooke

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Christina Isacson

Name: Christina Isacson

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Thomas Daniel

Name: Thomas Daniel

Address:

IN WITNESS WHEREOF, the parties have executed this Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

/s/ Michael Bonney
Name: Michael Bonney

Address:

[Signature Page to Amended and Restated Investors' Rights Agreement]

MAGENTA THERAPEUTICS, INC.

Joinder Signature Page

By executing and delivering this signature page, the undersigned hereby acknowledges and agrees that it is being issued that number of shares of Series B Preferred Stock, par value $0.001 per share, of Magenta Therapeutics, Inc. (the "Company") for the dollar amount all as set forth under the undersigned's name below. By executing and delivering this signature page, the undersigned hereby joins in, becomes a party to and agrees to be bound by the terms and conditions of:

1. that certain Series B Preferred Stock Purchase Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Purchasers (as such term is defined therein) (the "Stock Purchase Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stock Purchase Agreement in all respects as a "Purchaser";

2. that certain Amended and Restated Investors' Rights Agreement dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Investors (as such term is defined therein) (the "Investors' Rights Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Investors' Rights Agreement in all respects as an "Investor"; and

3. that certain Amended and Restated Stockholders Agreement dated as of April 21, 2017, as may be amended from time to time, by and among the Company, the Investors and the Key Holders (as such terms are defined therein) (the "Stockholders Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stockholders Agreement in all respects as an "Investor" and "Stockholder" (as such terms are defined therein).

The undersigned hereby authorizes this signature page or a copy hereof to be attached to the Stock Purchase Agreement, the Investors' Rights Agreement and the Stockholders Agreement or counterparts thereof.

Dated: May 1, 2017

INVESTOR:

CASDIN PARTNERS MASTER FUND, LP

By: Casdin Partners GP, LLC, its General Partner

By: /s/ Eli Casdin
Name: Eli Casdin
Title: Managing Partner

Number of shares of Series B Preferred Stock received:
1,029,680

Purchase price: $3,999,997.90

ACKNOWLEDGED AND AGREED:

MAGENTA THERAPEUTICS, INC.

By: /s/ Jason Gardner
Name: Jason Gardner
Title: CEO and President

MAGENTA THERAPEUTICS, INC.

Joinder Signature Page

By executing and delivering this signature page, the undersigned hereby acknowledges and agrees that it is acquiring that number of shares of Series B Preferred Stock, par value $0.001 per share, of Magenta Therapeutics, Inc. (the "Company") as set forth under the undersigned's name below. By executing and delivering this signature page, the undersigned hereby joins in, becomes a party to and agrees to be bound by the terms and conditions of:

1. that certain Series B Preferred Stock Purchase Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Purchasers (as such term is defined therein) (the "Stock Purchase Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stock Purchase Agreement in all respects as a "Purchaser";

2. that certain Amended and Restated Investors' Rights Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Investors (as such term is defined therein) (the "Investors' Rights Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Investors' Rights Agreement in all respects as an "Investor"; and

3. that certain Amended and Restated Stockholders Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company, the Investors and the Key Holders (as such terms are defined therein) (the "Stockholders Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stockholders Agreement in all respects as an "Investor" and "Stockholder" (as such terms are defined therein).

The undersigned hereby authorizes this signature page or a copy hereof to be attached to the Stock Purchase Agreement, the Investors' Rights Agreement and the Stockholders Agreement or counterparts thereof.

Dated: November 30, 2017

INVESTOR:

PARTNERS INNOVATION FUND II, L.P.

By: /s/ Roger Kitterman
Name: Roger Kitterman
Title: Manager

Number of shares of Series B Preferred Stock acquired:
308,904

ACKNOWLEDGED AND AGREED:

MAGENTA THERAPEUTICS, INC.

By: /s/ Jason Gardner
Name: Jason Gardner
Title: CEO and President

MAGENTA THERAPEUTICS, INC.

Joinder Signature Page

By executing and delivering this signature page, the undersigned hereby acknowledges and agrees that it is acquiring that number of shares of Series B Preferred Stock, par value $0.001 per share, of Magenta Therapeutics, Inc. (the "Company") as set forth under the undersigned's name below. By executing and delivering this signature page, the undersigned hereby joins in, becomes a party to and agrees to be bound by the terms and conditions of:

1. that certain Series B Preferred Stock Purchase Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Purchasers (as such term is defined therein) (the "Stock Purchase Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stock Purchase Agreement in all respects as a "Purchaser";

2. that certain Amended and Restated Investors' Rights Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Investors (as such term is defined therein) (the "Investors' Rights Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Investors' Rights Agreement in all respects as an "Investor"; and

3. that certain Amended and Restated Stockholders Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company, the Investors and the Key Holders (as such terms are defined therein) (the "Stockholders Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stockholders Agreement in all respects as an "Investor" and "Stockholder" (as such terms are defined therein).

The undersigned hereby authorizes this signature page or a copy hereof to be attached to the Stock Purchase Agreement, the Investors' Rights Agreement and the Stockholders Agreement or counterparts thereof.

Dated: December 13, 2017

INVESTOR:

J.P. GARDNER IRREVOCABLE TRUST

By: /s/ Patcharin S. Gardner
Name: Patcharin S. Gardner
Title: Trustee

By: /s/ Peter M. Frasca
Name: Peter M. Frasca, Esq.
Title: Trustee

Number of shares of Series B Preferred Stock acquired: 15,000

ACKNOWLEDGED AND AGREED:

MAGENTA THERAPEUTICS, INC.

By: /s/ Bastiano Sanna
Name: Bastiano Sanna
Title: Chief Operating Officer

MAGENTA THERAPEUTICS, INC.

Joinder Signature Page

By executing and delivering this signature page, the undersigned hereby acknowledges and agrees that it is acquiring that number of shares of Series B Preferred Stock, par value $0.001 per share, of Magenta Therapeutics, Inc. (the "Company") as set forth under the undersigned's name below. By executing and delivering this signature page, the undersigned hereby joins in, becomes a party to and agrees to be bound by the terms and conditions of:

1. that certain Series B Preferred Stock Purchase Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Purchasers (as such term is defined therein) (the "Stock Purchase Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stock Purchase Agreement in all respects as a "Purchaser";

2. that certain Amended and Restated Investors' Rights Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company and the Investors (as such term is defined therein) (the "Investors' Rights Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Investors' Rights Agreement in all respects as an "Investor"; and

3. that certain Amended and Restated Stockholders Agreement, dated as of April 21, 2017, as may be amended from time to time, by and among the Company, the Investors and the Key Holders (as such terms are defined therein) (the "Stockholders Agreement"), under which the undersigned agrees to and shall be bound by and subject to the terms of the Stockholders Agreement in all respects as an "Investor" and "Stockholder" (as such terms are defined therein).

The undersigned hereby authorizes this signature page or a copy hereof to be attached to the Stock Purchase Agreement, the Investors' Rights Agreement and the Stockholders Agreement or counterparts thereof.

Dated: December 13, 2017

INVESTOR:

P.S. GARDNER IRREVOCABLE TRUST

By: /s/ Jason P. Gardner
Name: Jason P. Gardner
Title: Trustee

By: /s/ Peter M. Frasca
Name: Peter M. Frasca, Esq.
Title: Trustee

Number of shares of Series B Preferred Stock acquired: 19,314

ACKNOWLEDGED AND AGREED:

MAGENTA THERAPEUTICS, INC.

By: /s/ Bastiano Sanna
Name: Bastiano Sanna
Title: Chief Operating Officer

SCHEDULE A

Name and Contact of Investors

THIRD ROCK VENTURES IV, L.P.
29 Newbury Street; 3rd Floor
Boston, MA 02116
Phone: (617)585-2000
Fax: (617) 859-2891
http://www.thirdrockventures.com

Atlas Venture Fund X, L.P.
400 Technology Square, 10th Floor
Cambridge, MA 02139
Attention: Ommer Chohan
E-mail: ommer@atlasventure.com, with a copy to bruce@atlasventure.com

GV 2016, L.P.
Email: notice@gv.com
Attn: Jennifer Kercher
1600 Amphitheatre Parkway
Mountain View, CA 94043

Be The Match BioTherapies, LLC
500 N. 5th Street
Minneapolis, Minnesota 55401-1206
Attn: Amy Ronneberg

Novartis Institutes for Biomedical Research, Inc.
250 Massachusetts Avenue
Cambridge, MA 02139

Access Industries Holdings LLC
c/o Access Industries Management, LLC
730 Fifth Avenue, 20th Floor
New York, New York 10019

Partners Innovation Fund LLC
215 First Street
Cambridge, MA 02142

Casdin Partners Master Fund, LP

Partners Innovation Fund II, L.P.
215 First Street
Cambridge, MA 02142

David Scadden

Derrick Rossi

Jason Gardner

Bastiano Sanna

Michael Cooke

Christina Isacson

Thomas Daniel

Michael Bonney

J.P. Gardner Irrevocable Trust

P.S. Gardner Irrevocable Trust

Exhibit 10.1

MAGENTA THERAPEUTICS, INC.

2016 STOCK OPTION AND GRANT PLAN

SECTION 1. GENERAL PURPOSE OF THE PLAN; DEFINITIONS

The name of the plan is the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "*Plan*"). The purpose of the Plan is to encourage and enable the officers, employees, directors, Consultants and other key persons of Magenta Therapeutics, Inc., a Delaware corporation (including any successor entity, the "*Company*") and its Subsidiaries, upon whose judgment, initiative and efforts the Company largely depends for the successful conduct of its business, to acquire a proprietary interest in the Company.

The following terms shall be defined as set forth below:

"*Affiliate*" of any Person means a Person that directly or indirectly, through one or more intermediaries, controls, is controlled by or is under common control with the first mentioned Person. A Person shall be deemed to control another Person if such first Person possesses directly or indirectly the power to direct, or cause the direction of, the management and policies of the second Person, whether through the ownership of voting securities, by contract or otherwise.

"*Award*" or "*Awards*," except where referring to a particular category of grant under the Plan, shall include Incentive Stock Options, Non-Qualified Stock Options, Restricted Stock Awards, Unrestricted Stock Awards, Restricted Stock Units or any combination of the foregoing.

"Award Agreement" means a written or electronic agreement setting forth the terms and provisions applicable to an Award granted under the Plan. Each Award Agreement may contain terms and conditions in addition to those set forth in the Plan; *provided, however,* in the event of any conflict in the terms of the Plan and the Award Agreement, the terms of the Plan shall govern**.**

"*Board*" means the Board of Directors of the Company.

"*Cause*" shall have the meaning as set forth in the Award Agreement(s). In the case that any Award Agreement does not contain a definition of "Cause," it shall mean (i) the grantee's dishonest statements or acts with respect to the Company or any Affiliate of the Company, or any current or prospective customers, suppliers vendors or other third parties with which such entity does business; (ii) the grantee's commission of (A) a felony or (B) any misdemeanor involving moral turpitude, deceit, dishonesty or fraud; (iii) the grantee's failure to perform his assigned duties and responsibilities to the reasonable satisfaction of the Company which failure continues, in the reasonable judgment of the Company, after written notice given to the grantee by the Company; (iv) the grantee's gross negligence, willful misconduct or insubordination with respect to the Company or any Affiliate of the Company; or (v) the grantee's material violation of any provision of any agreement(s) between the grantee and the Company relating to noncompetition, nonsolicitation, nondisclosure and/or assignment of inventions.

"Chief Executive Officer" means the Chief Executive Officer of the Company or, if there is no Chief Executive Officer, then the President of the Company.

"*Code*" means the Internal Revenue Code of 1986, as amended, and any successor Code, and related rules, regulations and interpretations.

"*Committee*" means the Committee of the Board referred to in Section 2.

"Consultant" means any natural person that provides bona fide services to the Company (including a Subsidiary), and such services are not in connection with the offer or sale of securities in a capital-raising transaction and do not directly or indirectly promote or maintain a market for the Company's securities.

"*Disability*" means "disability" as defined in Section 422(c) of the Code.

"*Effective Date*" means the date on which the Plan is adopted as set forth on the final page of the Plan.

"*Exchange Act*" means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

"*Fair Market Value*" of the Stock on any given date means the fair market value of the Stock determined in good faith by the Committee based on the reasonable application of a reasonable valuation method not inconsistent with Section 409A of the Code. If the Stock is admitted to trade on a national securities exchange, the determination shall be made by reference to the closing price reported on such exchange. If there is no closing price for such date, the determination shall be made by reference to the last date preceding such date for which there is a closing price. If the date for which Fair Market Value is determined is the first day when trading prices for the Stock are reported on a national securities exchange, the Fair Market Value shall be the "Price to the Public" (or equivalent) set forth on the cover page for the final prospectus relating to the Company's Initial Public Offering.

"Good Reason" shall have the meaning as set forth in the Award Agreement(s). In the case that any Award Agreement does not contain a definition of "Good Reason," it shall mean (i) a material diminution in the grantee's base salary except for across-the-board salary reductions similarly affecting all or substantially all similarly situated employees of the Company or (ii) a change of more than 50 miles in the geographic location at which the grantee provides services to the Company, so long as the grantee provides at least ninety (90) days notice to the Company following the initial occurrence of any such event and the Company fails to cure such event within thirty (30) days thereafter.

"*Grant Date*" means the date that the Committee designates in its approval of an Award in accordance with applicable law as the date on which the Award is granted, which date may not precede the date of such Committee approval.

"Holder" means, with respect to an Award or any Shares, the Person holding such Award or Shares, including the initial recipient of the Award or any Permitted Transferee.

"*Incentive Stock Option*" means any Stock Option designated and qualified as an "incentive stock option" as defined in Section 422 of the Code.

"*Initial Public Offering*" means the consummation of the first firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act covering the offer and sale by the Company of its equity securities, as a result of or following which the Stock shall be publicly held.

"*Non-Qualified Stock Option*" means any Stock Option that is not an Incentive Stock Option.

"*Option*" or "*Stock Option*" means any option to purchase shares of Stock granted pursuant to Section 5.

"*Permitted Transferees*" shall mean any of the following to whom a Holder may transfer Shares hereunder (as set forth in Section 9(a)(ii)(A)): the Holder's child, stepchild, grandchild, parent, stepparent, grandparent, spouse, former spouse, sibling, niece, nephew, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, any person sharing the Holder's household (other than a tenant or employee), a trust in which these persons have more than fifty percent of the beneficial interest, a foundation in which these persons control the management of assets, and any other entity in which these persons own more than fifty percent of the voting interests*; provided, however,* that any such trust does not require or permit distribution of any Shares during the term of the Award Agreement unless subject to its terms. Upon the death of the Holder, the term Permitted Transferees shall also include such deceased Holder's estate, executors, administrators, personal representatives, heirs, legatees and distributees, as the case may be.

"*Person*" shall mean any individual, corporation, partnership (limited or general), limited liability company, limited liability partnership, association, trust, joint venture, unincorporated organization or any similar entity.

"Restricted Stock Award" means Awards granted pursuant to Section 6 and *"Restricted Stock"* means Shares issued pursuant to such Awards.

"Restricted Stock Unit" means an Award of phantom stock units to a grantee, which may be settled in cash or Shares as determined by the Committee, pursuant to Section 8.

"*Sale Event"* means the consummation of (i) the dissolution or liquidation of the Company, (ii) the sale of all or substantially all of the assets of the Company on a consolidated basis to an unrelated person or entity, (iii) a merger, reorganization or consolidation pursuant to which the holders of the Company's outstanding voting power immediately prior to such transaction do not own a majority of the outstanding voting power of the surviving or resulting entity (or its ultimate parent, if applicable), (iv) the acquisition of all or a majority of the outstanding voting stock of the Company in a single transaction or a series of related transactions by a Person or group of Persons, (v) a Deemed Liquidation Event (as defined in the Company's

Certificate of Incorporation (as may be amended, restated or otherwise modified from time to time)), or (vi) any other acquisition of the business of the Company, as determined by the Board; *provided, however,* that the Company's Initial Public Offering, any subsequent public offering or another capital raising event, or a merger effected solely to change the Company's domicile shall not constitute a "Sale Event."

"*Section 409A*" means Section 409A of the Code and the regulations and other guidance promulgated thereunder.

"*Securities Act*" means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

"*Service Relationship*" means any relationship as a full-time employee, part-time employee, director or other key person (including Consultants) of the Company or any Subsidiary or any successor entity (e.g., a Service Relationship shall be deemed to continue without interruption in the event an individual's status changes from full-time employee to part-time employee or Consultant).

"*Shares*" means shares of Stock.

"*Stock*" means the Common Stock, par value $0.001 per share, of the Company.

"*Subsidiary*" means any corporation or other entity (other than the Company) in which the Company has more than a 50 percent interest, either directly or indirectly.

"*Ten Percent Owner*" means an employee who owns or is deemed to own (by reason of the attribution rules of Section 424(d) of the Code) more than 10 percent of the combined voting power of all classes of stock of the Company or any parent of the Company or any Subsidiary.

"*Termination Event*" means the termination of the Award recipient's Service Relationship with the Company and its Subsidiaries for any reason whatsoever, regardless of the circumstances thereof, and including, without limitation, upon death, disability, retirement, discharge or resignation for any reason, whether voluntarily or involuntarily. The following shall not constitute a Termination Event: (i) a transfer to the service of the Company from a Subsidiary or from the Company to a Subsidiary, or from one Subsidiary to another Subsidiary or (ii) an approved leave of absence for military service or sickness, or for any other purpose approved by the Committee, if the individual's right to re-employment is guaranteed either by a statute or by contract or under the policy pursuant to which the leave of absence was granted or if the Committee otherwise so provides in writing.

"*Unrestricted Stock Award*" means any Award granted pursuant to Section 7 and "*Unrestricted Stock*" means Shares issued pursuant to such Awards.

SECTION 2. ADMINISTRATION OF PLAN; COMMITTEE AUTHORITY TO SELECT GRANTEES AND DETERMINE AWARDS

(a) Administration of Plan. The Plan shall be administered by the Board, or at the discretion of the Board, by a committee of the Board, comprised of not less than two (2) directors. All references herein to the "Committee" shall be deemed to refer to the group then responsible for administration of the Plan at the relevant time (i.e., either the Board of Directors or a committee or committees of the Board, as applicable).

(b) Powers of Committee. The Committee shall have the power and authority to grant Awards consistent with the terms of the Plan, including the power and authority:

(i) to select the individuals to whom Awards may from time to time be granted;

(ii) to determine the time or times of grant, and the amount, if any, of Incentive Stock Options, Non-Qualified Stock Options, Restricted Stock Awards, Unrestricted Stock Awards, Restricted Stock Units, or any combination of the foregoing, granted to any one or more grantees;

(iii) to determine the number of Shares to be covered by any Award and, subject to the provisions of the Plan, the price, exercise price, conversion ratio or other price relating thereto;

(iv) to determine and, subject to Section 12, to modify from time to time the terms and conditions, including restrictions, not inconsistent with the terms of the Plan, of any Award, which terms and conditions may differ among individual Awards and grantees, and to approve the form of Award Agreements;

(v) to accelerate at any time the exercisability or vesting of all or any portion of any Award;

(vi) to impose any limitations on Awards, including limitations on transfers, repurchase provisions and the like, and to exercise repurchase rights or obligations;

(vii) subject to Section 5(a)(ii) and any restrictions imposed by Section 409A, to extend at any time the period in which Stock Options may be exercised; and

(viii) at any time to adopt, alter and repeal such rules, guidelines and practices for administration of the Plan and for its own acts and proceedings as it shall deem advisable; to interpret the terms and provisions of the Plan and any Award (including Award Agreements); to make all determinations it deems advisable for the administration of the Plan; to decide all disputes arising in connection with the Plan; and to otherwise supervise the administration of the Plan.

All decisions and interpretations of the Committee shall be binding on all persons, including the Company and all Holders.

(c) Delegation of Authority to Grant Options. Subject to applicable law, the Committee, in its discretion, may delegate to the Chief Executive Officer of the Company the power to designate non-officer employees to be recipients of Options, and to determine the number of such Options to be received by such employees; provided, however, that the resolution so authorizing the Chief Executive Officer shall specify the total number of Options

the Chief Executive Officer may so award and may not delegate to the Chief Executive Officer the authority to set the exercise price or the vesting terms of such Options. Any such delegation by the Committee shall also provide that the Chief Executive Officer may not grant Awards to himself or herself (or other officers) without the approval of the Committee. The Committee may revoke or amend the terms of a delegation at any time but such action shall not invalidate any prior actions of the Committee's delegate or delegates that were consistent with the terms of the Plan.

(d) Award Agreement. Awards under the Plan shall be evidenced by Award Agreements that set forth the terms, conditions and limitations for each Award.

(e) Indemnification. Neither the Board nor the Committee, nor any member of either or any delegate thereof, shall be liable for any act, omission, interpretation, construction or determination made in good faith in connection with the Plan, and the members of the Board and the Committee (and any delegate thereof) shall be entitled in all cases to indemnification and reimbursement by the Company in respect of any claim, loss, damage or expense (including, without limitation, reasonable attorneys' fees) arising or resulting therefrom to the fullest extent permitted by law and/or under the Company's governing documents, including its certificate of incorporation or bylaws (each, as may be amended, restated, or otherwise modified from time to time), or any directors' and officers' liability insurance coverage which may be in effect from time to time and/or any indemnification agreement between such individual and the Company.

(f) Foreign Award Recipients. Notwithstanding any provision of the Plan to the contrary, in order to comply with the laws in other countries in which the Company and any Subsidiary operate or have employees or other individuals eligible for Awards, the Committee, in its sole discretion, shall have the power and authority to: (i) determine which Subsidiaries, if any, shall be covered by the Plan; (ii) determine which individuals, if any, outside the United States are eligible to participate in the Plan; (iii) modify the terms and conditions of any Award granted to individuals outside the United States to comply with applicable foreign laws; (iv) establish subplans and modify exercise procedures and other terms and procedures, to the extent the Committee determines such actions to be necessary or advisable (and such subplans and/or modifications shall be attached to the Plan as appendices); provided, however, that no such subplans and/or modifications shall increase the share limitation contained in Section 3(a) hereof; and (v) take any action, before or after an Award is made, that the Committee determines to be necessary or advisable to obtain approval or comply with any local governmental regulatory exemptions or approvals.

SECTION 3. STOCK ISSUABLE UNDER THE PLAN; MERGERS AND OTHER TRANSACTIONS; SUBSTITUTION

(a) Stock Issuable. The maximum number of Shares reserved and available for issuance under the Plan shall be 7,025,000 Shares, subject to adjustment as provided in Section 3(b). For purposes of this limitation, the Shares underlying any Awards that are forfeited, canceled, reacquired by the Company prior to vesting, satisfied without the issuance of Stock or otherwise terminated (other than by exercise) and Shares that are withheld upon exercise of an Option or settlement of an Award to cover the exercise price or tax withholding shall be added back to the Shares available for issuance under the Plan. Subject to such overall limitations,

Shares may be issued up to such maximum number pursuant to any type or types of Award, and no more than 50,000,000 Shares may be issued pursuant to Incentive Stock Options. The Shares available for issuance under the Plan may be authorized but unissued Shares or Shares reacquired by the Company. Beginning on the date that the Company becomes subject to Section 162(m) of the Code, Options with respect to no more than 7,025,000 Shares shall be granted to any one individual in any calendar year period.

(b) Changes in Stock. Subject to Section 3(c) hereof, if, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Company's capital stock, the outstanding Shares are increased or decreased or are exchanged for a different number or kind of shares or other securities of the Company, or additional Shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such Shares or other securities, in each case, without the receipt of consideration by the Company, or, if, as a result of any merger or consolidation, or sale of all or substantially all of the assets of the Company, the outstanding Shares are converted into or exchanged for other securities of the Company or any successor entity (or a parent or subsidiary thereof), the Committee shall make an appropriate and proportionate adjustment in (i) the maximum number of Shares reserved for issuance under the Plan, (ii) the number and kind of Shares or other securities subject to any then outstanding Awards under the Plan, (iii) the repurchase price, if any, per Share subject to each outstanding Award, and (iv) the exercise price for each Share subject to any then outstanding Stock Options under the Plan, without changing the aggregate exercise price (i.e., the per share exercise price multiplied by the number of shares underlying such Stock Options) as to which such Stock Options remain exercisable. The adjustment by the Committee shall be final, binding and conclusive. No fractional Shares shall be issued under the Plan resulting from any such adjustment, but the Committee in its discretion may make a cash payment in lieu of fractional shares.

(c) Sale Events.

(i) Options.

(A) In the case of and subject to the consummation of a Sale Event, the Plan and all outstanding Options issued hereunder shall terminate upon the effective time of any such Sale Event unless assumed or continued by the successor entity, or new stock options or other awards of the successor entity or parent thereof are substituted therefor, with an equitable or proportionate adjustment as to the number and kind of shares and, if appropriate, the per share exercise prices, as such parties shall agree (after taking into account any acceleration hereunder and/or pursuant to the terms of any Award Agreement).

(B) In the event of the termination of the Plan and all outstanding Options issued hereunder pursuant to Section 3(c), each Holder of Options shall be permitted, within a period of time prior to the consummation of the Sale Event as specified by the Committee, to exercise all such Options which are then exercisable or will become exercisable as of the effective time of the Sale Event; *provided, however*, that the exercise of Options not exercisable prior to the Sale Event shall be subject to the consummation of the Sale Event.

(C) Notwithstanding anything to the contrary in Section 3(c)(i)(A), in the event of a Sale Event, the Company shall have the right, but not the obligation, to make or provide for a cash payment to the Holders of Options, without any consent of the Holders, in exchange for the cancellation thereof, in an amount equal to the difference between (A) the value as determined by the Committee of the consideration payable per share of Stock pursuant to the Sale Event (the "*Sale Price*") times the number of Shares subject to outstanding Options being cancelled (to the extent then vested and exercisable, including by reason of acceleration in connection with such Sale Event, at prices not in excess of the Sale Price) and (B) the aggregate exercise price of all such outstanding vested and exercisable Options.

(ii) Restricted Stock and Restricted Stock Unit Awards.

(A) In the case of and subject to the consummation of a Sale Event, all Restricted Stock and unvested Restricted Stock Unit Awards (other than those becoming vested as a result of the Sale Event) issued hereunder shall be forfeited immediately prior to the effective time of any such Sale Event unless assumed or continued by the successor entity, or awards of the successor entity or parent thereof are substituted therefor, with an equitable or proportionate adjustment as to the number and kind of shares subject to such awards as such parties shall agree (after taking into account any acceleration hereunder and/or pursuant to the terms of any Award Agreement).

(B) In the event of the forfeiture of Restricted Stock pursuant to Section 3(c)(ii)(A), such Restricted Stock shall be repurchased from the Holder thereof at a price per share equal to the lower of the original per share purchase price paid by the Holder (subject to adjustment as provided in Section 3(b)) or the current Fair Market Value of such Shares, determined immediately prior to the effective time of the Sale Event.

(C) Notwithstanding anything to the contrary in Section 3(c)(ii)(A), in the event of a Sale Event, the Company shall have the right, but not the obligation, to make or provide for a cash payment to the Holders of Restricted Stock or Restricted Stock Unit Awards, without consent of the Holders, in exchange for the cancellation thereof, in an amount equal to the Sale Price times the number of Shares subject to such Awards, to be paid at the time of such Sale Event or upon the later vesting of such Awards.

SECTION 4. ELIGIBILITY

Grantees under the Plan will be such full or part-time officers and other employees, directors, Consultants and key persons of the Company and any Subsidiary who are selected from time to time by the Committee in its sole discretion; provided, however, that Awards shall be granted only to those individuals described in Rule 701(c) of the Securities Act.

SECTION 5. STOCK OPTIONS

Upon the grant of a Stock Option, the Company and the grantee shall enter into an Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee, and such terms and conditions may differ among individual Awards and grantees.

Stock Options granted under the Plan may be either Incentive Stock Options or Non-Qualified Stock Options. Incentive Stock Options may be granted only to employees of the Company or any Subsidiary that is a "subsidiary corporation" within the meaning of Section 424(f) of the Code. To the extent that any Option does not qualify as an Incentive Stock Option, it shall be deemed a Non-Qualified Stock Option.

(a) Terms of Stock Options. The Committee in its discretion may grant Stock Options to those individuals who meet the eligibility requirements of Section 4. Stock Options shall be subject to the following terms and conditions and shall contain such additional terms and conditions, not inconsistent with the terms of the Plan, as the Committee shall deem desirable.

(i) Exercise Price. The exercise price per share for the Shares covered by a Stock Option shall be determined by the Committee at the time of grant but shall not be less than 100 percent of the Fair Market Value on the Grant Date. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the exercise price per share for the Shares covered by such Incentive Stock Option shall not be less than 110 percent of the Fair Market Value on the Grant Date.

(ii) Option Term. The term of each Stock Option shall be fixed by the Committee, but no Stock Option shall be exercisable more than ten (10) years from the Grant Date. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the term of such Stock Option shall be no more than five (5) years from the Grant Date.

(iii) Exercisability; Rights of a Stockholder. Stock Options shall become exercisable and/or vested at such time or times, whether or not in installments, as shall be determined by the Committee at or after the Grant Date. The Award Agreement may permit a grantee to exercise all or a portion of a Stock Option immediately at grant; provided that the Shares issued upon such exercise shall be subject to restrictions and a vesting schedule identical to the vesting schedule of the related Stock Option, such Shares shall be deemed to be Restricted Stock for purposes of the Plan, and the optionee may be required to enter into an additional or new Award Agreement as a condition to exercise of such Stock Option. An optionee shall have the rights of a stockholder only as to Shares acquired upon the exercise of a Stock Option and not as to unexercised Stock Options. An optionee shall not be deemed to have acquired any Shares unless and until a Stock Option shall have been exercised pursuant to the terms of the Award Agreement and this Plan and the optionee's name has been entered on the books of the Company as a stockholder.

(iv) Method of Exercise. Stock Options may be exercised by an optionee in whole or in part, by the optionee giving written or electronic notice of exercise to the Company, specifying the number of Shares to be purchased. Payment of the purchase price may be made by one or more of the following methods (or any combination thereof) to the extent provided in the Award Agreement:

(A) In cash, by certified or bank check, by wire transfer of immediately available funds, or other instrument acceptable to the Committee;

(B) If permitted by the Committee, by the optionee delivering to the Company a promissory note, if the Board has expressly authorized the loan of funds to the optionee for the purpose of enabling or assisting the optionee to effect the exercise of his or her Stock Option; provided, that at least so much of the exercise price as represents the par value of the Stock shall be paid in cash if required by state law;

(C) If permitted by the Committee and the Initial Public Offering has occurred (or the Stock otherwise becomes publicly-traded), through the delivery (or attestation to the ownership) of Shares that have been purchased by the optionee on the open market or that are beneficially owned by the optionee and are not then subject to restrictions under any Company plan. To the extent required to avoid variable accounting treatment under ASC 718 or other applicable accounting rules, such surrendered Shares if originally purchased from the Company shall have been owned by the optionee for at least six (6) months. Such surrendered Shares shall be valued at Fair Market Value on the exercise date;

(D) If permitted by the Committee and the Initial Public Offering has occurred (or the Stock otherwise becomes publicly-traded), by the optionee delivering to the Company a properly executed exercise notice together with irrevocable instructions to a broker to promptly deliver to the Company cash or a check payable and acceptable to the Company for the purchase price; provided that in the event the optionee chooses to pay the purchase price as so provided, the optionee and the broker shall comply with such procedures and enter into such agreements of indemnity and other agreements as the Committee shall prescribe as a condition of such payment procedure; or

(E) If permitted by the Committee, and only with respect to Stock Options that are not Incentive Stock Options, by a “net exercise” arrangement pursuant to which the Company will reduce the number of Shares issuable upon exercise by the largest whole number of Shares with a Fair Market Value that does not exceed the aggregate exercise price.

Payment instruments will be received subject to collection. No certificates for Shares so purchased will be issued to the optionee or, with respect to uncertificated Stock, no transfer to the optionee on the records of the Company will take place, until the Company has completed all steps it has deemed necessary to satisfy legal requirements relating to the issuance and sale of the Shares, which steps may include, without limitation, (i) receipt of a representation from the optionee at the time of exercise of the Option that the optionee is purchasing the Shares for the optionee’s own account and not with a view to any sale or distribution of the Shares or other representations relating to compliance with applicable law governing the issuance of securities, (ii) the legending of the certificate (or notation on any book entry) representing the Shares to evidence the foregoing restrictions, (iii) obtaining from optionee payment or provision for all

withholding taxes due as a result of the exercise of the Option, and (iv) if required by the Company, the optionee's execution and delivery of any stockholders' agreements or other agreements with the Company and/or certain other stockholders of the Company relating to shares of the Stock. The delivery of certificates representing the shares of Stock (or the transfer to the optionee on the records of the Company with respect to uncertificated Stock) to be purchased pursuant to the exercise of a Stock Option will be contingent upon (A) receipt from the optionee (or a purchaser acting in his or her stead in accordance with the provisions of the Stock Option) by the Company of the full purchase price for such Shares and the fulfillment of any other requirements contained in the Award Agreement or applicable provisions of laws and (B) if required by the Company, the optionee shall have entered into any stockholders agreements or other agreements with the Company and/or certain other of the Company's stockholders relating to the Stock. In the event an optionee chooses to pay the purchase price by previously-owned Shares through the attestation method, the number of Shares transferred to the optionee upon the exercise of the Stock Option shall be net of the number of Shares attested to.

(b) Annual Limit on Incentive Stock Options. To the extent required for "incentive stock option" treatment under Section 422 of the Code, the aggregate Fair Market Value (determined as of the Grant Date) of the Shares with respect to which Incentive Stock Options granted under the Plan and any other plan of the Company or its parent and any Subsidiary that become exercisable for the first time by an optionee during any calendar year shall not exceed $100,000 or such other limit as may be in effect from time to time under Section 422 of the Code. To the extent that any Stock Option exceeds this limit, it shall constitute a Non-Qualified Stock Option.

(c) Termination. Any portion of a Stock Option that is not vested and exercisable on the date of termination of an optionee's Service Relationship shall immediately expire and be null and void. Once any portion of the Stock Option becomes vested and exercisable, the optionee's right to exercise such portion of the Stock Option (or the optionee's representatives and legatees as applicable) in the event of a termination of the optionee's Service Relationship shall continue until the earliest of: (i) the date which is: (A) twelve (12) months following the date on which the optionee's Service Relationship terminates due to death or Disability (or such longer period of time as determined by the Committee and set forth in the applicable Award Agreement), or (B) three (3) months following the date on which the optionee's Service Relationship terminates if the termination is due to any reason other than death or Disability (or such longer period of time as determined by the Committee and set forth in the applicable Award Agreement), or (ii) the Expiration Date set forth in the Award Agreement; provided that notwithstanding the foregoing, an Award Agreement may provide that if the optionee's Service Relationship is terminated for Cause, the Stock Option shall terminate immediately and be null and void upon the date of the optionee's termination and shall not thereafter be exercisable.

SECTION 6. RESTRICTED STOCK AWARDS

(a) Nature of Restricted Stock Awards. The Committee may, in its sole discretion, grant (or sell at par value or such other purchase price determined by the Committee) to an eligible individual under Section 4 hereof a Restricted Stock Award under the Plan. The Committee shall determine the restrictions and conditions applicable to each Restricted Stock Award at the time of grant. Conditions may be based on continuing employment (or other

Service Relationship), achievement of pre-established performance goals and objectives and/or such other criteria as the Committee may determine. Upon the grant of a Restricted Stock Award, the Company and the grantee shall enter into an Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee, and such terms and conditions may differ among individual Awards and grantees.

(b) Rights as a Stockholder. Upon the grant of the Restricted Stock Award and payment of any applicable purchase price, a grantee of Restricted Stock shall be considered the record owner of and shall be entitled to vote the Restricted Stock if, and to the extent, such Shares are entitled to voting rights, subject to such conditions contained in the Award Agreement. The grantee shall be entitled to receive all dividends and any other distributions declared on the Shares; provided, however, that the Company is under no duty to declare any such dividends or to make any such distribution. Unless the Committee shall otherwise determine, certificates evidencing the Restricted Stock shall remain in the possession of the Company until such Restricted Stock is vested as provided in subsection (d) below of this Section, and the grantee shall be required, as a condition of the grant, to deliver to the Company a stock power endorsed in blank and such other instruments of transfer as the Committee may prescribe.

(c) Restrictions. Restricted Stock may not be sold, assigned, transferred, pledged or otherwise encumbered or disposed of except as specifically provided herein or in the Award Agreement. Except as may otherwise be provided by the Committee either in the Award Agreement or, subject to Section 12 below, in writing after the Award Agreement is issued, if a grantee's Service Relationship with the Company and any Subsidiary terminates, the Company or its assigns shall have the right, as may be specified in the relevant instrument, to repurchase some or all of the Shares subject to the Award at such purchase price as is set forth in the Award Agreement.

(d) Vesting of Restricted Stock. The Committee at the time of grant shall specify in the Award Agreement the date or dates and/or the attainment of pre-established performance goals, objectives and other conditions on which the substantial risk of forfeiture imposed shall lapse and the Restricted Stock shall become vested, subject to such further rights of the Company or its assigns as may be specified in the Award Agreement.

SECTION 7. UNRESTRICTED STOCK AWARDS

The Committee may, in its sole discretion, grant (or sell at par value or such other purchase price determined by the Committee) to an eligible person under Section 4 hereof an Unrestricted Stock Award under the Plan. Unrestricted Stock Awards may be granted in respect of past services or other valid consideration, or in lieu of cash compensation due to such grantee.

SECTION 8. RESTRICTED STOCK UNITS

(a) Nature of Restricted Stock Units. The Committee may, in its sole discretion, grant to an eligible person under Section 4 hereof Restricted Stock Units under the Plan. The Committee shall determine the restrictions and conditions applicable to each Restricted Stock Unit at the time of grant. Vesting conditions may be based on continuing employment (or other

Service Relationship), achievement of pre-established performance goals and objectives and/or other such criteria as the Committee may determine. Upon the grant of Restricted Stock Units, the grantee and the Company shall enter into an Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee and may differ among individual Awards and grantees. On or promptly following the vesting date or dates applicable to any Restricted Stock Unit, but in no event later than March 15 of the year following the year in which such vesting occurs, such Restricted Stock Unit(s) shall be settled in the form of cash or shares of Stock, as specified in the Award Agreement. Restricted Stock Units may not be sold, assigned, transferred, pledged, or otherwise encumbered or disposed of.

(b) Rights as a Stockholder. A grantee shall have the rights of a stockholder only as to Shares, if any, acquired upon settlement of Restricted Stock Units. A grantee shall not be deemed to have acquired any such Shares unless and until the Restricted Stock Units shall have been settled in Shares pursuant to the terms of the Plan and the Award Agreement, the Company shall have issued and delivered a certificate representing the Shares to the grantee (or transferred on the records of the Company with respect to uncertificated stock), and the grantee's name has been entered in the books of the Company as a stockholder.

(c) Termination. Except as may otherwise be provided by the Committee either in the Award Agreement or in writing after the Award Agreement is issued, a grantee's right in all Restricted Stock Units that have not vested shall automatically terminate upon the grantee's cessation of Service Relationship with the Company and any Subsidiary for any reason.

SECTION 9. TRANSFER RESTRICTIONS; COMPANY RIGHT OF FIRST REFUSAL; COMPANY REPURCHASE RIGHTS

(a) Restrictions on Transfer.

(i) Non-Transferability of Stock Options. Stock Options and, prior to exercise, the Shares issuable upon exercise of such Stock Option, shall not be transferable by the optionee otherwise than by will, or by the laws of descent and distribution, and all Stock Options shall be exercisable, during the optionee's lifetime, only by the optionee, or by the optionee's legal representative or guardian in the event of the optionee's incapacity. Notwithstanding the foregoing, the Committee, in its sole discretion, may provide in the Award Agreement regarding a given Stock Option that the optionee may transfer by gift, without consideration for the transfer, his or her Non-Qualified Stock Options to his or her family members (as defined in Rule 701 of the Securities Act), to trusts for the benefit of such family members, or to partnerships in which such family members are the only partners (to the extent such trusts or partnerships are considered "family members" for purposes of Rule 701 of the Securities Act), provided that the transferee agrees in writing with the Company to be bound by all of the terms and conditions of this Plan and the applicable Award Agreement, including the execution of a stock power upon the issuance of Shares. Stock Options, and the Shares issuable upon exercise of such Stock Options, shall be restricted as to any pledge, hypothecation, or other transfer, including any short position, any "put equivalent position" (as defined in the Exchange Act) or any "call equivalent position" (as defined in the Exchange Act) prior to exercise.

(ii) Shares. No Shares shall be sold, assigned, transferred, pledged, hypothecated, given away or in any other manner disposed of or encumbered, whether voluntarily or by operation of law, unless (i) the transfer is in compliance with the terms of the applicable Award Agreement, all applicable securities laws (including, without limitation, the Securities Act), and with the terms and conditions of this Section 9, (ii) the transfer does not cause the Company to become subject to the reporting requirements of the Exchange Act, and (iii) the transferee consents in writing to be bound by the provisions of the Plan and the Award Agreement, including this Section 9. In connection with any proposed transfer, the Committee may require the transferor to provide at the transferor's own expense an opinion of counsel to the transferor, satisfactory to the Committee, that such transfer is in compliance with all foreign, federal and state securities laws (including, without limitation, the Securities Act). Any attempted transfer of Shares not in accordance with the terms and conditions of this Section 9 shall be null and void, and the Company shall not reflect on its records any change in record ownership of any Shares as a result of any such transfer, shall otherwise refuse to recognize any such transfer and shall not in any way give effect to any such transfer of Shares. The Company shall be entitled to seek protective orders, injunctive relief and other remedies available at law or in equity including, without limitation, seeking specific performance or the rescission of any transfer not made in strict compliance with the provisions of this Section 9. Subject to the foregoing general provisions, and unless otherwise provided in the applicable Award Agreement, Shares may be transferred pursuant to the following specific terms and conditions (provided that with respect to any transfer of Restricted Stock, all vesting and forfeiture provisions shall continue to apply with respect to the original recipient):

(A) Transfers to Permitted Transferees. The Holder may transfer any or all of the Shares to one or more Permitted Transferees; *provided, however*, that following such transfer, such Shares shall continue to be subject to the terms of this Plan (including this Section 9) and such Permitted Transferee(s) shall, as a condition to any such transfer, deliver a written acknowledgment to that effect to the Company and shall deliver a stock power to the Company with respect to the Shares. Notwithstanding the foregoing, the Holder may not transfer any of the Shares to a Person whom the Company reasonably determines is a direct competitor or a potential competitor of the Company or any of its Subsidiaries.

(B) Transfers Upon Death. Upon the death of the Holder, any Shares then held by the Holder at the time of such death and any Shares acquired after the Holder's death by the Holder's legal representative shall be subject to the provisions of this Plan, and the Holder's estate, executors, administrators, personal representatives, heirs, legatees and distributees shall be obligated to convey such Shares to the Company or its assigns under the terms contemplated by the Plan and the Award Agreement.

(b) Right of First Refusal. In the event that a Holder desires at any time to sell or otherwise transfer all or any part of his or her Shares (other than shares of Restricted Stock which by their terms are not transferrable), the Holder first shall give written notice to the Company of the Holder's intention to make such transfer. Such notice shall state the number of Shares that the Holder proposes to sell (the "*Offered Shares*"), the price and the terms at which the proposed sale is to be made and the name and address of the proposed transferee. At any time within thirty (30) days after the receipt of such notice by the Company, the Company or its

assigns may elect to purchase all or any portion of the Offered Shares at the price and on the terms offered by the proposed transferee and specified in the notice. The Company or its assigns shall exercise this right by mailing or delivering written notice to the Holder within the foregoing thirty (30) day period. If the Company or its assigns elect to exercise its purchase rights under this Section 9(b), the closing for such purchase shall, in any event, take place within forty-five (45) days after the receipt by the Company of the initial notice from the Holder. In the event that the Company or its assigns do not elect to exercise such purchase right, or in the event that the Company or its assigns do not pay the full purchase price within such forty-five (45) day period, the Holder may, within sixty (60) days thereafter, sell the Offered Shares to the proposed transferee and at the same price and on the same terms as specified in the Holder's notice. Any Shares not sold to the proposed transferee shall remain subject to the Plan. If the Holder is a party to any stockholders agreements or other agreements with the Company and/or certain other of the Company's stockholders relating to the Shares, (i) the transferring Holder shall comply with the requirements of such stockholders agreements or other agreements relating to any proposed transfer of the Offered Shares, and (ii) any proposed transferee that purchases Offered Shares shall enter into such stockholders agreements or other agreements with the Company and/or certain of the Company's stockholders relating to the Offered Shares on the same terms and in the same capacity as the transferring Holder.

(c) Company's Right of Repurchase.

(i) Right of Repurchase for Unvested Shares Issued Upon the Exercise of an Option. Upon a Termination Event, the Company or its assigns shall have the right and option to repurchase from a Holder of Shares acquired upon exercise of a Stock Option which are still subject to a risk of forfeiture as of the Termination Event. Such repurchase rights may be exercised by the Company within the later of (A) six (6) months following the date of such Termination Event or (B) seven (7) months after the acquisition of Shares upon exercise of a Stock Option. The repurchase price shall be equal to the lower of the original per share price paid by the Holder, subject to adjustment as provided in Section 3(b) of the Plan, or the current Fair Market Value of such Shares as of the date the Company elects to exercise its repurchase rights.

(ii) Right of Repurchase With Respect to Restricted Stock. Upon a Termination Event, the Company or its assigns shall have the right and option to repurchase from a Holder of Shares received pursuant to a Restricted Stock Award any Shares that are still subject to a risk of forfeiture as of the Termination Event. Such repurchase right may be exercised by the Company within six (6) months following the date of such Termination Event. The repurchase price shall be the lower of the original per share purchase price paid by the Holder, subject to adjustment as provided in Section 3(b) of the Plan, or the current Fair Market Value of such Shares as of the date the Company elects to exercise its repurchase rights.

(iii) Procedure. Any repurchase right of the Company shall be exercised by the Company or its assigns by giving the Holder written notice on or before the last day of the repurchase period of its intention to exercise such repurchase right. Upon such notification, the Holder shall promptly surrender to the Company, free and clear of any liens or encumbrances, any certificates representing the Shares being purchased, together with a duly executed stock power for the transfer of such Shares to the Company or the Company's assignee or assignees.

Upon the Company's or its assignee's receipt of the certificates from the Holder, the Company or its assignee or assignees shall deliver to him, her or them a check for the applicable repurchase price; *provided, however*, that the Company may pay the repurchase price by offsetting and canceling any indebtedness then owed by the Holder to the Company.

(d) Drag Along Right. In the event the holders of a majority of the Company's equity securities then outstanding (the "*Majority Shareholders*") determine to enter into a Sale Event in a bona fide negotiated transaction (a "*Sale*"), with any non-Affiliate of the Company or any majority shareholder (in each case, the "*Buyer*"), a Holder of Shares, including any Permitted Transferee, shall be obligated to and shall upon the written request of the Majority Shareholders: (a) sell, transfer and deliver, or cause to be sold, transferred and delivered, to the Buyer, his or her Shares (including for this purpose all of such Holder's Shares that presently or as a result of any such transaction may be acquired upon the exercise of an Option (following the payment of the exercise price therefor)) on substantially the same terms applicable to the Majority Shareholders (with appropriate adjustments to reflect the conversion of convertible securities, the redemption of redeemable securities and the exercise of exercisable securities as well as the relative preferences and priorities of preferred stock); and (b) execute and deliver such instruments of conveyance and transfer and take such other action, including voting such Shares in favor of any Sale proposed by the Majority Shareholders and executing any purchase agreements, merger agreements, indemnity agreements, escrow agreements or related documents as the Majority Shareholders or the Buyer may reasonably require in order to carry out the terms and provisions of this Section 9(d).

(e) Escrow Arrangement.

(i) Escrow. In order to carry out the provisions of this Section 9 of this Plan more effectively, the Company shall hold any Shares issued pursuant to Awards granted under the Plan in escrow together with separate stock powers executed by the Holder in blank for transfer. The Company shall not dispose of the Shares except as otherwise provided in this Plan. In the event of any repurchase by the Company (or any of its assigns), the Company is hereby authorized by the Holder, as the Holder's attorney-in-fact, to date and complete the stock powers necessary for the transfer of the Shares being purchased and to transfer such Shares in accordance with the terms hereof. At such time as any Shares are no longer subject to the Company's repurchase and first refusal rights, the Company shall, at the written request of the Holder, deliver to the Holder a certificate representing such Shares with the balance of the Shares to be held in escrow pursuant to this Section.

(ii) Remedy. Without limitation of any other provision of this Plan or other rights, in the event that a Holder or any other Person is required to sell a Holder's Shares pursuant to the provisions of Sections 9(b) or (c) hereof and in the further event that he or she refuses or for any reason fails to deliver to the Company or its designated purchaser of such Shares the certificate or certificates evidencing such Shares together with a related stock power, the Company or such designated purchaser may deposit the applicable purchase price for such Shares with a bank designated by the Company, or with the Company's independent public accounting firm, as agent or trustee, or in escrow, for such Holder or other Person, to be held by such bank or accounting firm for the benefit of and for delivery to him, her, them or it, and/or, in its discretion, pay such purchase price by offsetting any indebtedness then owed by such Holder

as provided above. Upon any such deposit and/or offset by the Company or its designated purchaser of such amount and upon notice to the Person who was required to sell the Shares to be sold pursuant to the provisions of Sections 9(b) or (c), such Shares shall at such time be deemed to have been sold, assigned, transferred and conveyed to such purchaser, such Holder shall have no further rights thereto (other than the right to withdraw the payment thereof held in escrow, if applicable), and the Company shall record such transfer in its stock transfer book or in any appropriate manner.

(f) Lockup Provision. If requested by the Company, a Holder shall not sell or otherwise transfer or dispose of any Shares (including, without limitation, pursuant to Rule 144 under the Securities Act) held by him or her for such period following the effective date of a public offering by the Company of Shares as the Company shall specify reasonably and in good faith. If requested by the underwriter engaged by the Company, each Holder shall execute a separate letter confirming his or her agreement to comply with this Section.

(g) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding Shares are increased or decreased or are exchanged for a different number or kind of securities of the Company, the restrictions contained in this Section 9 shall apply with equal force to additional and/or substitute securities, if any, received by Holder in exchange for, or by virtue of his or her ownership of, Shares.

(h) Termination. The terms and provisions of Section 9(b) and Section 9(c) (except for the Company's right to repurchase Shares still subject to a risk of forfeiture upon a Termination Event) shall terminate upon the closing of the Company's Initial Public Offering or upon consummation of any Sale Event, in either case as a result of which Shares are registered under Section 12 of the Exchange Act and publicly-traded on any national security exchange.

SECTION 10. TAX WITHHOLDING

(a) Payment by Grantee. Each grantee shall, no later than the date as of which the value of an Award or of any Shares or other amounts received thereunder first becomes includable in the gross income of the grantee for income tax purposes, pay to the Company, or make arrangements satisfactory to the Committee regarding payment of, any Federal, state, or local taxes of any kind required by law to be withheld by the Company with respect to such income. The Company and any Subsidiary shall, to the extent permitted by law, have the right to deduct any such taxes from any payment of any kind otherwise due to the grantee. The Company's obligation to deliver stock certificates (or evidence of book entry) to any grantee is subject to and conditioned on any such tax withholding obligations being satisfied by the grantee.

(b) Payment in Stock. The Company's minimum required tax withholding obligation may be satisfied, in whole or in part, by the Company withholding from Shares to be issued pursuant to an Award a number of Shares having an aggregate Fair Market Value (as of the date the withholding is effected) that would satisfy the minimum withholding amount due.

SECTION 11. SECTION 409A AWARDS.

To the extent that any Award is determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A (a "*409A Award*"), the Award shall be subject to such additional rules and requirements as may be specified by the Committee from time to time. In this regard, if any amount under a 409A Award is payable upon a "separation from service" (within the meaning of Section 409A) to a grantee who is considered a "specified employee" (within the meaning of Section 409A), then no such payment shall be made prior to the date that is the earlier of (i) six (6) months and one day after the grantee's separation from service, or (ii) the grantee's death, but only to the extent such delay is necessary to prevent such payment from being subject to interest, penalties and/or additional tax imposed pursuant to Section 409A. The Company makes no representation or warranty and shall have no liability to any grantee under the Plan or any other Person with respect to any penalties or taxes under Section 409A that are, or may be, imposed with respect to any Award.

SECTION 12. AMENDMENTS AND TERMINATION

The Board may, at any time, amend or discontinue the Plan and the Committee may, at any time, amend or cancel any outstanding Award for the purpose of satisfying changes in law or for any other lawful purpose, but no such action shall adversely affect rights under any outstanding Award without the consent of the holder of the Award. The Committee may exercise its discretion to reduce the exercise price of outstanding Stock Options or effect repricing through cancellation of outstanding Stock Options and by granting such holders new Awards in replacement of the cancelled Stock Options. To the extent determined by the Committee to be required either by the Code to ensure that Incentive Stock Options granted under the Plan are qualified under Section 422 of the Code or otherwise, Plan amendments shall be subject to approval by the Company stockholders entitled to vote at a meeting of stockholders. Nothing in this Section 12 shall limit the Board's or Committee's authority to take any action permitted pursuant to Section 3(c). The Board reserves the right to amend the Plan and/or the terms of any outstanding Stock Options to the extent reasonably necessary to comply with the requirements of the exemption pursuant to paragraph (f)(4) of Rule 12h-1 of the Exchange Act.

SECTION 13. STATUS OF PLAN

With respect to the portion of any Award that has not been exercised and any payments in cash, Stock or other consideration not received by a grantee, a grantee shall have no rights greater than those of a general creditor of the Company unless the Committee shall otherwise expressly so determine in connection with any Award.

SECTION 14. GENERAL PROVISIONS

(a) No Distribution; Compliance with Legal Requirements. The Committee may require each person acquiring Shares pursuant to an Award to represent to and agree with the Company in writing that such person is acquiring the Shares without a view to distribution thereof. No Shares shall be issued pursuant to an Award until all applicable securities law and other legal and stock exchange or similar requirements have been satisfied. The Committee may require the placing of such stop-orders and restrictive legends on certificates for Stock and Awards as it deems appropriate.

(b) Delivery of Stock Certificates. Stock certificates to grantees under the Plan shall be deemed delivered for all purposes when the Company or a stock transfer agent of the Company shall have mailed such certificates in the United States mail, addressed to the grantee, at the grantee's last known address on file with the Company; provided that stock certificates to be held in escrow pursuant to Section 9 of the Plan shall be deemed delivered when the Company shall have recorded the issuance in its records. Uncertificated Stock shall be deemed delivered for all purposes when the Company or a stock transfer agent of the Company shall have given to the grantee by electronic mail (with proof of receipt) or by United States mail, addressed to the grantee, at the grantee's last known address on file with the Company, notice of issuance and recorded the issuance in its records (which may include electronic "book entry" records).

(c) No Employment Rights**.** The adoption of the Plan and the grant of Awards do not confer upon any Person any right to continued employment or Service Relationship with the Company or any Subsidiary.

(d) Trading Policy Restrictions. Option exercises and other Awards under the Plan shall be subject to the Company's insider trading policy-related restrictions, terms and conditions as may be established by the Committee, or in accordance with policies set by the Committee, from time to time.

(e) Designation of Beneficiary. Each grantee to whom an Award has been made under the Plan may designate a beneficiary or beneficiaries to exercise any Award on or after the grantee's death or receive any payment under any Award payable on or after the grantee's death. Any such designation shall be on a form provided for that purpose by the Committee and shall not be effective until received by the Committee. If no beneficiary has been designated by a deceased grantee, or if the designated beneficiaries have predeceased the grantee, the beneficiary shall be the grantee's estate.

(f) Legend. Any certificate(s) representing the Shares shall carry substantially the following legend (and with respect to uncertificated Stock, the book entries evidencing such shares shall contain the following notation):

> The transferability of this certificate and the shares of stock represented hereby are subject to the restrictions, terms and conditions (including repurchase and restrictions against transfers) contained in the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan and any agreements entered into thereunder by and between the company and the holder of this certificate (a copy of which is available at the offices of the company for examination).

(g) Information to Holders of Options. In the event the Company is relying on the exemption from the registration requirements of Section 12(g) of the Exchange Act contained in paragraph (f)(1) of Rule 12h-1 of the Exchange Act, the Company shall provide the information

described in Rule 701(e)(3), (4) and (5) of the Securities Act to all holders of Options in accordance with the requirements thereunder. The foregoing notwithstanding, the Company shall not be required to provide such information unless the optionholder has agreed in writing, on a form prescribed by the Company, to keep such information confidential.

SECTION 15. EFFECTIVE DATE OF PLAN

The Plan shall become effective upon adoption by the Board and shall be approved by stockholders in accordance with applicable state law and the Company's certificate of incorporation and bylaws within twelve (12) months thereafter. If the stockholders fail to approve the Plan within twelve (12) months after its adoption by the Board of Directors, then any Awards granted or sold under the Plan shall be rescinded and no additional grants or sales shall thereafter be made under the Plan. Subject to such approval by stockholders and to the requirement that no Shares may be issued hereunder prior to such approval, Stock Options and other Awards may be granted hereunder on and after adoption of the Plan by the Board. No grants of Stock Options and other Awards may be made hereunder after the tenth anniversary of the date the Plan is adopted by the Board or the date the Plan is approved by the Company's stockholders, whichever is earlier.

SECTION 16. GOVERNING LAW

This Plan, all Awards and any controversy arising out of or relating to this Plan and all Awards shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the State of Massachusetts.

DATE ADOPTED BY THE BOARD OF DIRECTORS: November 1, 2016

DATE APPROVED BY THE STOCKHOLDERS: November 1, 2016

Amendment to increase number of shares reserved under the Plan to 10,377,440 shares approved and adopted by the Board on April 21, 2017 and by the stockholders on April 21, 2017.

RESTRICTED STOCK AWARD NOTICE
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN

Pursuant to the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "Plan"), Magenta Therapeutics, Inc., a Delaware corporation (together with any successor, the "Company"), hereby grants, sells and issues to the individual named below, the Shares at the Per Share Purchase Price, subject to the terms and conditions set forth in this Restricted Stock Award Notice (the "Award Notice"), the attached Restricted Stock Agreement (the "Agreement") and the Plan. The Grantee agrees to the provisions set forth herein and acknowledges that each such provision is a material condition of the Company's agreement to issue and sell the Shares to him or her. The Company hereby acknowledges receipt of **$[ ]** in full payment for the Shares. All references to share prices and amounts herein shall be equitably adjusted to reflect stock splits, stock dividends, recapitalizations, mergers, reorganizations and similar changes affecting the capital stock of the Company, and any shares of capital stock of the Company received on or in respect of Shares in connection with any such event (including any shares of capital stock or any right, option or warrant to receive the same or any security convertible into or exchangeable for any such shares or received upon conversion of any such shares) shall be subject to this Agreement on the same basis and extent at the relevant time as the Shares in respect of which they were issued, and shall be deemed Shares as if and to the same extent they were issued at the date hereof.

Name of Grantee:	(the "Grantee")
No. of Shares:	Shares of Common Stock (the "Shares")
Grant Date:	, [1]
Date of Purchase of Shares:	,
Vesting Commencement Date:	, (the "Vesting Commencement Date")
Per Share Purchase Price:	$ (the "Per Share Purchase Price")
Vesting Schedule:	[25] percent of the Shares shall vest on the first anniversary of the Vesting Commencement Date; provided that the Grantee continues to have a Service Relationship with the Company at such time. Thereafter, the remaining [75] percent of the Shares shall vest in [36] equal monthly installments following the first anniversary of the Vesting Commencement Date until [ ], on which date, subject to the vesting conditions herein, all remaining Shares shall vest, provided the Grantee continues to have a Service Relationship with the Company at such time. Notwithstanding anything in the Agreement to the contrary in the case of a Sale Event, the Shares of Restricted Stock shall be treated as provided in Section 3(c) of the Plan.

[1] 83(b) Election must be made within 30 days of the date of sale or grant.

Attachments: Restricted Stock Agreement, 2016 Stock Option and Grant Plan

RESTRICTED STOCK AGREEMENT
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Award Notice and the Plan.

1. Purchase and Sale of Shares; Vesting; Investment Representations.

(a) Purchase and Sale. The Company hereby sells to the Grantee, and the Grantee hereby purchases from the Company, the number of Shares set forth in the Award Notice for the Per Share Purchase Price.

(b) Vesting. Initially, all of the Shares are non-transferable and subject to a substantial risk of forfeiture and are Shares of Restricted Stock. The risk of forfeiture shall lapse with respect to the Shares on the respective dates indicated on the Vesting Schedule set forth in the Award Notice.

(c) Investment Representations. In connection with the purchase and sale of the Shares contemplated by Section 1(a) above, the Grantee hereby represents and warrants to the Company as follows:

(i) The Grantee is purchasing the Shares for the Grantee's own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) The Grantee has had such an opportunity as he or she has deemed adequate to obtain from the Company such information as is necessary to permit him or her to evaluate the merits and risks of the Grantee's investment in the Company and has consulted with the Grantee's own advisers with respect to the Grantee's investment in the Company.

(iii) The Grantee has sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) The Grantee can afford a complete loss of the value of the Shares and is able to bear the economic risk of holding such Shares for an indefinite period.

(v) The Grantee understands that the Shares are not registered under the Act (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Act and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirements thereof). The Grantee further acknowledges that certificates representing the Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

(vi) The Grantee has read and understands the Plan and acknowledges and agrees that the Shares are subject to all of the relevant terms of the Plan, including without limitation, the transfer restrictions set forth in Section 9 of the Plan.

(vii) The Grantee understands and agrees that the Company has a right of first refusal with respect to the Shares pursuant to Section 9(b) of the Plan.

(viii) The Grantee understands and agree that the Company has certain repurchase rights with respect to the Shares pursuant to Section 9(c) of the Plan.

(ix) The Grantee understands and agrees that the Grantee may not sell or otherwise transfer or dispose of the Shares for a period of time following the effective date of a public offering by the Company as described in Section 9(f) of the Plan.

2. Repurchase Right. Upon a Termination Event, the Company shall have the right to repurchase Shares of Restricted Stock that are unvested as of the date of such Termination Event as set forth in Section 9(c) of the Plan.

3. Restrictions on Transfer of Shares. The Shares (whether or not vested) shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan

4. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Restricted Stock Award shall be subject to and governed by all the terms and conditions of the Plan.

5. Miscellaneous Provisions.

(a) Record Owner; Dividends. The Grantee and any Permitted Transferees, during the duration of this Agreement, shall be considered the record owners of and shall be entitled to vote the Shares if and to the extent the Shares are entitled to voting rights. The Grantee and any Permitted Transferees shall be entitled to receive all dividends and any other distributions declared on the Shares; provided, however, that the Company is under no duty to declare any such dividends or to make any such distribution.

(b) Section 83(b) Election. The Grantee shall consult with the Grantee's tax advisor to determine whether it would be appropriate for the Grantee to make an election under Section 83(b) of the Code with respect to this Award. Any such election must be filed with the Internal Revenue Service within 30 days of the date of this Award. If the Grantee makes an election under Section 83(b) of the Code, the Grantee shall give prompt notice to the Company (and provide a copy of such election to the Company).

(c) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(d) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Grantee.

(e) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(f) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(g) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(h) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Grantee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(i) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(j) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

(k) Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter. The execution of this Agreement satisfies in full any express or implied obligation, agreement or promise by or on the part of the Company to grant or issue to the Grantee any equity interest in the Company pursuant to any offer letter, employment agreement, consulting or other written or oral agreement or arrangement as of the Grant Date.

6. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or the Shares, this Agreement, or the breach, termination or validity of the Plan, the Shares or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1—16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Grantee, each party to the Agreement and any other holder of Shares issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 6 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each

other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Restricted Stock Agreement is hereby accepted and the terms and conditions thereof are hereby agreed to by the undersigned as of the date of purchase of Shares above written.

MAGENTA THERAPEUTICS, INC.

By: _____
Name:
Title:

Address:

_____

_____

_____

The undersigned hereby acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof and understands that the Shares granted hereby are subject to the terms of the Plan and of this Agreement. This Agreement is hereby accepted, and the terms and conditions of the Plan, the Award Notice and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS SET FORTH IN SECTION 6 OF THIS AGREEMENT, are hereby agreed to, by the undersigned as of the date first above written.

GRANTEE:

_____
Name:

Address:

_____

_____

_____

[SPOUSE'S CONSENT[2]
I acknowledge that I have read the
foregoing Restricted Stock Agreement
and understand the contents thereof.

_____]

[2] A spouse's consent is required only if the Grantee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, New Mexico, Nevada, Texas, Washington and Wisconsin.

INCENTIVE STOCK OPTION GRANT NOTICE
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN

Pursuant to the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "Plan"), Magenta Therapeutics, Inc., a Delaware corporation (together with any successor, the "Company"), has granted to the individual named below, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value $0.001 per share ("Common Stock"), of the Company indicated below (the "Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Incentive Stock Option Grant Notice (the "Grant Notice"), the attached Incentive Stock Option Agreement (the "Agreement") and the Plan. This Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code"). To the extent that any portion of the Stock Option does not so qualify, it shall be deemed a non-qualified stock option.

Name of Optionee:	(the "Optionee")
No. of Shares:	Shares of Common Stock
Grant Date:	
Vesting Commencement Date:	(the "Vesting Commencement Date")
Expiration Date:	(the "Expiration Date")
Option Exercise Price/Share:	$ (the "Option Exercise Price")
Vesting Schedule:	[25] percent of the Shares shall vest and become exercisable on the first anniversary of the Vesting Commencement Date; provided that the Optionee continues to have a Service Relationship with the Company at such time. Thereafter, the remaining [75] percent of the Shares shall vest and become exercisable in [36] equal monthly installments following the first anniversary of the Vesting Commencement Date, provided the Optionee continues to have a Service Relationship with the Company on each vesting date. [Notwithstanding anything in the Agreement to the contrary, in the case of a Sale Event, this Stock Option and the Shares shall be treated as provided in Section 3(c) of the Plan] **[provided; however INSERT ANY ACCELERATED VESTING PROVISION HERE].**

Attachments: Incentive Stock Option Agreement, 2016 Stock Option and Grant Plan

INCENTIVE STOCK OPTION AGREEMENT
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Grant Notice and the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Except as set forth below, and subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall be vested and exercisable on the respective dates indicated below:

(i) This Stock Option shall initially be unvested and unexercisable.

(ii) This Stock Option shall vest and become exercisable in accordance with the Vesting Schedule set forth in the Grant Notice.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case, to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or Disability, this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or Disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or Disability, and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees. Any portion of this Stock Option that is not vested and exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

(d) It is understood and intended that this Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422 of the Code to the extent permitted under applicable law. Accordingly, the Optionee understands that in order to obtain the benefits of an incentive stock option under Section 422 of the Code, no sale or other disposition may be made of Shares for which incentive stock option treatment is desired within the one-year period beginning on the day after the day of the transfer of such Shares to him or her, nor within the two-year period beginning on the day after Grant Date of this Stock Option and further that this Stock Option must be exercised within three months after termination of employment as an employee (or 12 months in the case of death or disability) to qualify as an incentive stock option. If the Optionee disposes (whether by sale, gift, transfer or otherwise) of any such Shares within either of these periods, he or she will notify the Company within 30 days after such disposition. The Optionee also agrees to provide the Company with any information concerning any such dispositions required by the Company for tax purposes. Further, to the extent this Stock Option and any other incentive stock options of the Optionee having an aggregate Fair Market Value in excess of $100,000 (determined as of the Grant Date) first become exercisable in any year, such options will not qualify as incentive stock options.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an "Exercise Notice") in the form of Appendix A hereto indicating his or her election to purchase some or all of the Shares with respect to which this Stock Option is then exercisable. Such notice shall specify the number of Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Section 5 of the Plan, subject to the limitations contained in such Section of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Stock Option is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee's lifetime only by the Optionee (or by the Optionee's guardian or personal representative in the event of the Optionee's incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee's Stock Option in the event of the Optionee's death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee's death.

5. Restrictions on Transfer of Shares. The Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of securities of the Company, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, this Stock Option or Shares acquired pursuant thereto.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

(j) Integration. This Agreement constitutes the entire agreement between the parties with respect to this Stock Option and supersedes all prior agreements and discussions between the parties concerning such subject matter. The execution of this Agreement satisfies in full any express or implied obligation, agreement or promise by or on the part of the Company to grant or issue to the Grantee any equity interest in the Company pursuant to any offer letter, employment agreement, consulting or other written or oral agreement or arrangement as of the Grant Date.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1 16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Shares issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

MAGENTA THERAPEUTICS, INC.

By: _____
Name:
Title:

Address:

_____

_____

_____

The undersigned hereby acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that this Stock Option is subject to the terms of the Plan and of this Agreement. This Agreement is hereby accepted, and the terms and conditions of the Plan, the Grant Notice and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS SET FORTH IN SECTION 7 OF THIS AGREEMENT, are hereby agreed to, by the undersigned as of the date first above written.

OPTIONEE:

_____
Name:

Address:

_____

_____

_____

[SPOUSE'S CONSENT[3]
I acknowledge that I have read the foregoing Incentive Stock Option Agreement and understand the contents thereof.

_____]

3 A spouse's consent is recommended only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary's Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Magenta Therapeutics, Inc.
Attention: [_____]

_____

_____

Pursuant to the terms of the grant notice and stock option agreement between the undersigned and Magenta Therapeutics, Inc. (the "Company") dated (the "Agreement") under the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan, I, [Insert Name] , hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of $ representing the purchase price for [Fill in number of Shares] Shares. I have chosen the following form(s) of payment:

[ ] 1. Cash

[ ] 2. Certified or bank check payable to Magenta Therapeutics, Inc.

[ ] 3. Other (as referenced in the Agreement and described in the Plan (please describe))
_____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period of time.

(v) I understand that the Shares may not be registered under the Securities Act of 1933 (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

(vi) I have read and understand the Plan and acknowledge and agree that the Shares are subject to all of the relevant terms of the Plan, including without limitation, the transfer restrictions set forth in Section 9 of the Plan.

(vii) I understand and agree that the Company has a right of first refusal with respect to the Shares pursuant to Section 9(b) of the Plan.

(viii) I understand and agree that the Company has certain repurchase rights with respect to the Shares pursuant to Section 9(c) of the Plan.

(ix) I understand and agree that I may not sell or otherwise transfer or dispose of the Shares for a period of time following the effective date of a public offering by the Company as described in Section 9(f) of the Plan.

Sincerely yours,

Name: _____

Address: _____

_____

_____

_____

Date: _____

NON-QUALIFIED STOCK OPTION GRANT NOTICE
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN

Pursuant to the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "Plan"), Magenta Therapeutics, Inc., a Delaware corporation (together with any successor, the "Company"), has granted to the individual named below, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value $0.001 per share ("Common Stock"), of the Company indicated below (the "Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Non-Qualified Stock Option Grant Notice (the "Grant Notice"), the attached Non-Qualified Stock Option Agreement (the "Agreement") and the Plan. This Stock Option is not intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code").

Name of Optionee:		(the "Optionee")
No. of Shares:	Shares of Common Stock	
Grant Date:		
Vesting Commencement Date:		(the "Vesting Commencement Date")
Expiration Date:		(the "Expiration Date")
Option Exercise Price/Share:	$	(the "Option Exercise Price")
Vesting Schedule:	[25] percent of the Shares shall vest and become exercisable on the first anniversary of the Vesting Commencement Date; provided that the Optionee continues to have a Service Relationship with the Company at such time. Thereafter, the remaining [75] percent of the Shares shall vest and become exercisable in [36] equal monthly installments following the first anniversary of the Vesting Commencement Date, provided the Optionee continues to have a Service Relationship with the Company on each vesting date. [Notwithstanding anything in the Agreement to the contrary, in the case of a Sale Event, this Stock Option and the Shares shall be treated as provided in Section 3(c) of the Plan] [**provided; however INSERT ANY ACCELERATED VESTING PROVISION HERE]**.	

Attachments: Non-Qualified Stock Option Agreement, 2016 Stock Option and Grant Plan

NON-QUALIFIED STOCK OPTION AGREEMENT
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Grant Notice and the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Except as set forth below, and subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall be vested and exercisable on the respective dates indicated below:

(i) This Stock Option shall initially be unvested and unexercisable.

(ii) This Stock Option shall vest and become exercisable in accordance with the Vesting Schedule set forth in the Grant Notice.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case, to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or Disability, this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or Disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or Disability, and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees and any Permitted Transferee. Any portion of this Stock Option that is not vested and exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an "Exercise Notice") in the form of Appendix A hereto indicating his or her election to purchase some or all of the Shares with respect to which this Stock Option is then exercisable. Such notice shall specify the number of Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Section 5 of the Plan, subject to the limitations contained in such Section of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Stock Option is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee's lifetime only by the Optionee (or by the Optionee's guardian or personal representative in the event of the Optionee's incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee's Stock Option in the event of the Optionee's death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee's death.

5. Restrictions on Transfer of Shares. The Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of securities of the Company, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, this Stock Option or Shares acquired pursuant thereto.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

(j) Integration. This Agreement constitutes the entire agreement between the parties with respect to this Stock Option and supersedes all prior agreements and discussions between the parties concerning such subject matter. The execution of this Agreement satisfies in full any express or implied obligation, agreement or promise by or on the part of the Company to grant or issue to the Grantee any equity interest in the Company pursuant to any offer letter, employment agreement, consulting or other written or oral agreement or arrangement as of the Grant Date.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1-16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Shares issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

MAGENTA THERAPEUTICS, INC.

By: _____
Name:
Title:

Address:

_____

_____

_____

The undersigned hereby acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that this Stock Option is subject to the terms of the Plan and of this Agreement. This Agreement is hereby accepted, and the terms and conditions of the Plan, the Grant Notice and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS SET FORTH IN SECTION 7 OF THIS AGREEMENT, are hereby agreed to, by the undersigned as of the date first above written.

OPTIONEE:

_____
Name:

Address:

_____

_____

_____

[SPOUSE'S CONSENT[4]
I acknowledge that I have read the
foregoing Non-Qualified Stock Option Agreement
and understand the contents thereof.

_____]

[4] A spouse's consent is recommended only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary’s Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Magenta Therapeutics, Inc.
Attention: [_____]

_____

_____

Pursuant to the terms of the grant notice and stock option agreement between the undersigned and Magenta Therapeutics, Inc. (the "Company") dated (the "Agreement") under the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan, I, [Insert Name] , hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of $ representing the purchase price for [Fill in number of Shares] Shares. I have chosen the following form(s) of payment:

[ ] 1. Cash

[ ] 2. Certified or bank check payable to Magenta Therapeutics, Inc.

[ ] 3. Other (as referenced in the Agreement and described in the Plan (please describe)) _____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period of time.

(v) I understand that the Shares may not be registered under the Securities Act of 1933 (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

(vi) I have read and understand the Plan and acknowledge and agree that the Shares are subject to all of the relevant terms of the Plan, including without limitation, the transfer restrictions set forth in Section 9 of the Plan.

(vii) I understand and agree that the Company has a right of first refusal with respect to the Shares pursuant to Section 9(b) of the Plan.

(viii) I understand and agree that the Company has certain repurchase rights with respect to the Shares pursuant to Section 9(c) of the Plan.

(ix) I understand and agree that I may not sell or otherwise transfer or dispose of the Shares for a period of time following the effective date of a public offering by the Company as described in Section 9(f) of the Plan.

Sincerely yours,

_____

Name:

Address:

_____

_____

_____

Date: _____

EXHIBIT 10.6

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

Execution Copy

LICENSE AGREEMENT

This License Agreement (this "Agreement") is entered into as of this 2nd day of November, 2016 (the "Effective Date"), by and between Magenta Therapeutics, Inc., a corporation existing under the laws of the State of Delaware, having a place of business at 245 First St. 4th Floor, Cambridge MA 02142 ("Licensee") and **President and Fellows of Harvard College**, an educational and charitable corporation existing under the laws and the constitution of the Commonwealth of Massachusetts, having a place of business at Richard A. and Susan F. Smith Campus Center, Suite 727, 1350 Massachusetts Avenue, Cambridge, Massachusetts 02138 ("Harvard").

WHEREAS, the technology claimed in the Patent Rights (as defined below) was developed through research conducted by Dr. David T. Scadden and other Harvard researchers;

WHEREAS, Harvard owns the Patent Rights related to Harvard Case #[***], as described in Exhibit 1.18 hereto, jointly with The General Hospital Corporation d/b/a Massachusetts General Hospital, with offices at 55 Fruit Street, Boston, MA 02114 ("MGH"), and Children's Medical Center Corporation, with offices at 300 Longwood Avenue, Boston, MA 02115 ("Children's," and collectively with MGH and Harvard, the "Institutions"), and Harvard owns the Patent Rights related to Harvard Case ## [***] and [***], as described in Exhibit 1.18 hereto, jointly with MGH;

WHEREAS, as between the Institutions, Harvard has the sole and exclusive right and authority to grant licenses under the Patent Rights, on behalf of itself, Children's and MGH, pursuant to that certain Invention Administration Agreement dated as of October 4, 2016, by and between Harvard, Children's and MGH, and pursuant to that certain Invention Administration Agreement dated as of November 2, 2016, by and between Harvard and MGH;

WHEREAS, Licensee wishes to obtain a license under the Patent Rights;

WHEREAS, Harvard desires to have products based on the inventions described in the Patent Rights developed and commercialized to benefit the public;

WHEREAS, such products and/or services may be applicable to the improvement of the health of individuals throughout the world; and

WHEREAS, Licensee has represented to Harvard, in order to induce Harvard to enter into this Agreement, that Licensee shall commit itself to commercially reasonable efforts to develop, obtain regulatory approval for and commercialize such products;

NOW, THEREFORE, in consideration of the mutual covenants and promises herein, the sufficiency of which is hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree as follows:

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

1. Definitions.

As used in this Agreement, the terms with initial letters capitalized, whether used in the singular or plural form, shall have the meanings set forth in this Article 1 or, if not listed below, the meaning designated in places throughout this Agreement.

1.1. "Affiliate" means, with respect to a person, organization or entity, any person, organization or entity controlling, controlled by or under common control with, such person, organization or entity. For purposes of this definition only, "control" of another person, organization or entity will mean the possession, directly or indirectly, of the power to direct or cause the direction of the activities, management or policies of such person, organization or entity, whether through the ownership of voting securities, by contract or otherwise. Without limiting the foregoing, control will be presumed to exist when a person, organization or entity (a) owns or directly controls fifty percent (50%) or more of the outstanding voting stock or other ownership interest of the other organization or entity or (b) possesses, directly or indirectly, the power to elect or appoint fifty percent (50%) or more of the members of the governing body of the other organization or entity. The parties acknowledge that in the case of certain entities organized under the laws of certain countries outside of the United States, the maximum percentage ownership permitted by law for a foreign investor may be less than fifty percent (50%), and that in such cases such lower percentage will be substituted in the preceding sentence.

1.2. "Calendar Quarter" means each of the periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31 during the Term.

1.3. "Commercially Reasonable Efforts" means the level of efforts and resources consistent with the efforts and resources normally used by a similarly situated biotechnology company in the exercise of commercially reasonable business discretion relating to the development, manufacture or commercialization of a biopharmaceutical product with similar scientific and technical product characteristics that is of similar market potential at a similar stage of development or commercialization, taking into account issues of efficacy, safety, product profile, anticipated or approved labeling, present and future market potential, competitive market conditions, the proprietary position of the drug substance or product, the regulatory structure involved, the complexity, costs and challenges of clinical development, and other key technical, legal, scientific, medical or commercial factors or challenges, and the likely profitability of the product.

1.4. "Covered" means, when referring to an invention, an invention is disclosed in a patent or pending patent application and is recited in one or more claims of said patent or patent application.

1.5. "Development Milestones" means the development and commercialization milestones set forth in Exhibit 1.5 hereto.

1.6. "Development Plan" means the plan for the development and commercialization of Licensed Products attached hereto as Exhibit 1.6, as such plan may be adjusted from time to time pursuant to Section 3.2.

1.7. "Dominated by" means, when used to refer to any invention as "Dominated by" any other patent or patent application, that, without a license to practice such other patent or patent application, the practice of such invention would infringe at least one claim made under such other patent or patent application.

1.8. "FDA" means the United States Food and Drug Administration.

1.9. "Field" means the treatment, palliation or prevention of any disease, disorder or condition in humans or animals.

1.10. "First Commercial Sale" means the date of the first sale by Licensee, its Affiliate or a Sublicensee of a Licensed Product to a Third Party for end use or consumption of such Licensed Product following receipt of any required Marketing Authorization in the country in which such Licensed Product is sold, excluding, however, any sale or other distribution for use in a clinical study.

1.11. "Improvement" means a patentable invention (a) disclosed to Harvard's Office of Technology Development within [***] following the Effective Date; (b) that is Dominated by a claim of a granted patent of the Patent Rights or would be Dominated by a claim of a pending application of the Patent Rights, (c) arises [***], and (d) is available for licensing after satisfaction of any obligations to Third Parties under binding agreements with such Third Parties, including without limitation, sponsors of the research leading to such invention.

1.12. "Infringed Patent" means an issued and unexpired patent, or a pending patent application not within the Patent Rights (a) that is not Dominated by a Valid Claim, (b) has not been abandoned, held invalid, revoked, held or rendered unenforceable or lost through interference, and (c) the claims of which would be infringed by Licensee's making, using, selling, offering for sale or importing of a Type I Licensed Product.

1.13. "IND" means an FDA investigational new drug application, clinical study application, clinical trial exemption, or similar application or submission for approval to conduct human clinical investigations filed with or submitted to a Regulatory Authority in any country in conformance with the requirements of such Regulatory Authority.

1.14. "Licensed Product" means any Type I Licensed Product and any Type II Licensed Product.

1.15. "Marketing Authorization" means all approvals from the relevant Regulatory Authority necessary to market and sell a Licensed Product in a country.

1.16. "Net Sales" means the gross amount billed or invoiced by or on behalf of Licensee, any Sublicensee or any of their Affiliates (each, an "Invoicing Entity") from the sales of Licensed Products to independent third party customers by or on behalf of Licensee, such Sublicensee or Affiliate, as applicable, in bona-fide arms-length transactions less the following deductions, which may not exceed reasonable and customary amounts in the biopharmaceutical industry in the country in which the transaction occurs:

(a) Customer freight charges actually paid by the Invoicing Entity;

(b) Trade, quantity, cash or other discounts and brokers' or agents' commissions, if any, actually allowed and taken by the Invoicing Entity;

(c) Price reductions or rebates, retroactive or otherwise, imposed by, negotiated with or otherwise paid to governmental authorities or other payees;

(d) Credits or allowances made or given on account of rejects, defects, recalls, returns, or retroactive price reductions for any amount not collected that are specifically identifiable or allocable to Licensed Products; and

(e) Any tax or governmental charge directly on sale or transportation, use or delivery of products paid by or on behalf of the Invoicing Entity and not recovered from the purchaser, but not including any tax levied with respect to income.

In the event that an Invoicing Entity receives non-cash consideration for any Licensed Products or in the case of transactions not at arm's length with a non-Affiliate of an Invoicing Entity, Net Sales will be calculated based on the fair market value of such consideration or transaction, assuming an arm's length transaction made in the ordinary course of.

In any transfers of Licensed Products between an Invoicing Entity and an Affiliate of such Invoicing Entity not for the purpose of resale by such Affiliate, Net Sales will be equal to the fair market value of the Licensed Products so transferred, assuming an arm's length transaction made in the ordinary course of business.

Sales of Licensed Products by an Invoicing Entity to its Affiliate or a Sublicensee for resale by such Affiliate or Sublicensee will not be deemed Net Sales. Instead, Net Sales will be determined based on the gross amount billed or invoiced by such Affiliate or Sublicensee upon resale of such Licensed Products to a third party purchaser.

Net Sales shall exclude sales or transfers of Licensed Products for charitable or government-approved programs for compassionate use purposes or named patient programs or any other similar program that provides for the legally-permitted sale or transfer to an end-user of a Licensed Product for such Licensed Product in such country.

1.17. "Non-Royalty Income" means any payments or other consideration that Licensee or any of its Affiliates receives in connection with a Sublicense or a Strategic Partnership, other than (a) royalties based on Net Sales, (b) amounts received to cover future reasonable, fully-burdened costs incurred by Licensee or its Affiliates in the performance of research and development of Licensed Products after the Effective Date, (c) amounts received as reimbursement for out-of-pocket costs incurred by Licensee in the preparation, filing, prosecution and maintenance of the Patent Rights, or (d) consideration for the issuance of equity or debt interests in Licensee to the extent the amount paid for such equity or debt does not exceed its fair market value; provided, that, [***]. If Licensee or its Affiliate receives non-cash consideration in connection with a Sublicense or Strategic Partnership or in the case of transactions not at arm's length, Non-Royalty Income will be calculated based on the fair market value of such consideration or transaction, at the time of the transaction, assuming an arm's length transaction made in the ordinary course of business. To the extent Licensee receives

compensation for both a grant of a Sublicense of rights under Section 2.1 and the grant of other rights or licenses to intellectual property other than a Sublicense of rights granted under Section 2.1, other than a right or license to intellectual property not owned by Harvard but Dominated by any Valid Claim within the Patent Rights, such compensation will be reasonably apportioned between that amount attributable to the sublicense of rights under Section 2.1, which shall be deemed Non-Royalty Income, and that amount attributable to the grant of other rights or licenses in such other intellectual property, which shall be excluded from Non-Royalty Income, such apportionment to be reasonably agreed upon by the Parties; provided, that in any event, the portion of the total overall transaction value of such sublicenses attributable directly to the Sublicense of the Patent Rights shall not be less than 50%. For the avoidance of doubt, Non-Royalty Income shall not include consideration received by Licensee or its equityholders in connection with a merger, consolidation, or sale of equity, of Licensee, or the sale or transfer of all or substantially all of the assets or business of Licensee pertaining to the subject matter of this Agreement, to a successor (any such transaction to be referred to as an "M&A Transaction").

1.18. "Patent Rights" means, in each case to the extent owned and controlled by Harvard: (a) the patents and patent applications listed in Exhibit 1.18 (including the PCT and/or U.S. utility application claiming priority to such application(s) that are filed on or before the one year conversion date of such application(s)); (b) any patent or patent application that claims priority to and is a divisional, continuation, reissue, renewal, reexamination, substitution or extension of any patent application identified in (a); (c) any patents issuing on any patent application identified in (a) or (b), including any reissues, renewals, reexaminations, substitutions or extensions thereof; (d) any claim of a continuation-in-part application or patent (including any reissues, renewals, reexaminations, substitutions or extensions thereof) that is entitled to the priority date of, and is directed specifically to subject matter specifically described in, at least one of the patents or patent applications identified in (a), (b) or (c); (e) any foreign counterpart (including PCTs) of any patent or patent application identified in (a), (b) or (c) or of the claims identified in (d); and (f) any supplementary protection certificates, pediatric exclusivity periods, any other patent term extensions and exclusivity periods and the like of any patents and patent applications identified in (a) through (e).

1.19. "Patient Treatment Purposes" means (i) use in patient care; or (ii) a clinical trial that is not funded or sponsored by any Third Party for-profit or commercial entity, and for which no Third Party for-profit or commercial entity acquires license rights, option rights or ownership of any results of such clinical trial.

1.20. "Phase 1 Clinical Study" means a clinical study in any country involving the initial introduction of an investigational new drug into humans, typically designed to determine the metabolism and pharmacologic actions of the drug in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness. In the United States, "Phase 1 Clinical Study" means a human clinical study that satisfies the requirements of 21 C.F.R. § 312.21(a).

1.21. "Phase 2 Clinical Study" means a human clinical study in any country conducted to evaluate the effectiveness of a drug for a particular indication or indications in patients with the disease or condition under study and, possibly, to determine the common short-term side effects and risks associated with the drug. In the United States, "Phase 2 Clinical Study" means a human clinical study that satisfies the requirements of 21 C.F.R. § 312.21 (b).

1.22. "Phase 3 Clinical Study" means a human clinical study in any country, whether controlled or uncontrolled, that is performed after preliminary evidence suggesting effectiveness of the drug under evaluation has been obtained, and intended to gather the additional information about effectiveness and safety that is needed to evaluate the overall benefit-risk relationship of the drug and to provide an adequate basis for physician labeling. In the United States, "Phase 3 Clinical Study means a human clinical study that satisfies the requirements of 21 C.F.R. § 312.21 (c).

1.23. "Regulatory Authority" means any applicable government regulatory authority involved in granting approvals for the manufacturing and marketing of a Licensed Product, including, in the United States, the FDA.

1.24. "Strategic Partner" means any entity that agrees to compensate Licensee or its Affiliate in exchange for: Licensee's or its Affiliate's practice of the Patent Rights and/or development of Licensed Products, on behalf of or in collaboration with such entity, including without limitation, for commercialization and development activities for Licensed Products. Any entity which meets the foregoing criteria, that also receives a Sublicense shall be considered a Sublicensee, and not a Strategic Partner, for the purposes of this Agreement.

1.25. "Strategic Partnership" means any agreement between Licensee or any of its Affiliates and a Strategic Partner.

1.26. "Sublicense" means: (a) any right granted, license given or agreement entered into by Licensee to or with any other person or entity, under or with respect to or permitting any use or exploitation of any of the Patent Rights or otherwise permitting the development, manufacture, marketing, distribution, use and/or sale of Licensed Products; (b) any option or other right granted by Licensee to any other person or entity to negotiate for or receive any of the rights described under clause (a); or (c) any standstill or similar obligation undertaken by Licensee toward any other person or entity not to grant any of the rights described in clause (a) or (b) to any third party; in each case regardless of whether such grant of rights, license given or agreement entered into is referred to or is described as a sublicense.

1.27. "Sublicensee" means any person or entity granted a Sublicense.

1.28. "Term" means the term of this Agreement as set forth in Section 10.1.

1.29. "Third Party" means any entity or person other than Harvard or Licensee or its Affiliates.

1.30. "Type I Licensed Product" means on a country-by-country basis, any product or service, the making, using, selling, offering for sale, importing, exporting or performing in the country in question would (without the license granted hereunder) infringe, directly, indirectly by inducement of infringement, or through contributory infringement, at least one pending Valid Claim (were it to have issued) or issued Valid Claim in that country.

1.31. "Type II Licensed Product" means any product, other than a Type I Licensed Product, which (i) is a modification, improvement or optimization of a Type I Licensed Product, or (ii) is described in, or is developed through the practice of the technology enabled by the subject matter of the Patent Rights, including, without limitation, the Patent Rights listed on Exhibit 1.18 as of the Effective Date.

1.32. "Valid Claim" means: (a) a claim of an issued and unexpired patent within the Patent Rights that has not been (i) held permanently revoked, unenforceable, unpatentable or invalid by a decision of a court or governmental body of competent jurisdiction, unappealable or unappealed within the time allowed for appeal, (ii) rendered unenforceable through disclaimer or otherwise, (iii) abandoned or (iv) permanently lost through an interference or opposition proceeding without any right of appeal or review; or (b) a pending claim of a pending patent application within the Patent Rights that (i) has been asserted and continues to be prosecuted in good faith, (ii) has not been abandoned or finally rejected without the possibility of appeal or refiling, and (iii) has not been pending for more than seven (7) years from the date of issuance of the first substantive patent office action considering patentability of such claim by the relevant patent office in the country or territory in which such claim is pending. For purposes of calculating the end of the seven (7) years for which a given pending claim upon which a first substantive patent office action has been received remains a Valid Claim in accordance with clause (b)(iii) of the preceding sentence, that claim as originally filed and as it subsequently may be amended shall be deemed to be one and the same single claim entitled to a single period of seven (7) years, such period commencing upon the first substantive patent office action that occurs for any version of such single claim.

2. License.

2.1. License Grant. Subject to the terms and conditions set forth in this Agreement, Harvard hereby grants to Licensee an exclusive, worldwide, royalty-bearing license under the Patent Rights, solely to research, develop, make, have made, use, sell, offer for sale, have sold, export and import Licensed Products solely for use within the Field; provided, however, that:

2.1.1. Harvard retains the right, for itself, the Institutions, and for other not-for-profit research organizations, to practice the Patent Rights within the scope of the license granted above, solely for research, educational and scholarly purposes, and for Patient Treatment Purposes by Institutions' clinical affiliates; provided, that such retained rights shall not include the right to grant any license, sublicense or option right in or to the Patent Rights to make, have made, sell, offer for sale, have sold, export or import products for use within the Field to any third party for-profit or commercial entity; and

2.1.2. the United States federal government retains rights in the Patent Rights pursuant to 35 U.S.C. §§ 200-212 and 37 C.F.R. § 401 et seq., and any right granted in this Agreement greater than that permitted under 35 U.S.C. §§ 200-212 or 37 C.F.R. § 401 et seq. will be subject to modification as may be required to conform to the provisions of those statutes and regulations.

2.2. Affiliates. The license granted to Licensee under Section 2.1 includes the right to have some or all of Licensee's rights or obligations under this Agreement exercised or performed by one or more of Licensee's Affiliates, solely on Licensee's behalf; provided, however, that:

2.2.1. no such Affiliate shall be entitled to grant, directly or indirectly, to any third party any right of whatever nature under, or with respect to, or permitting any use or exploitation of, any of the Patent Rights, including any right to develop, manufacture, market or sell Licensed Products; and

2.2.2. any act or omission taken or made by an Affiliate of Licensee under this Agreement will be deemed an act or omission by Licensee under this Agreement.

2.3. Sublicenses.

2.3.1. Sublicense Grant. Licensee will be entitled to grant Sublicenses to Third Parties under the licenses granted pursuant to clause (a) of Section 2.1, subject to the terms of this Section 2.3; provided, that, [***]. Such Sublicenses shall include the right to grant further Sublicenses through any number of tiers. All Sublicenses shall be subject to the terms of this Section 2.3, and otherwise on terms and conditions in compliance with and not inconsistent with the terms of this Agreement.

2.3.2. Sublicense Agreements. Licensee shall grant sublicenses pursuant to written agreements, which will be subject and subordinate to the terms and conditions of this Agreement. Such Sublicense agreements will contain, among other things, the following:

2.3.2.1. all provisions necessary to ensure Licensee's ability to perform its obligations under this Agreement;

2.3.2.2. a section substantially the same as Article 9 of this Agreement, which also will state that the Indemnitees (as defined in Section 9.1) are intended third party beneficiaries of such Sublicense agreement for the purpose of enforcing such indemnification;

2.3.2.3. a provision clarifying that, in the event of termination of the license set forth in Section **2.1** (in whole or in part (e.g., termination in a particular country)), any existing Sublicense agreement shall terminate to the extent of such terminated license; provided that such Sublicensee shall have the right to enter into a direct license with Harvard under the terms set forth in Section **10**.3**.1** so long as such Sublicensee is in good standing under such Sublicense agreement and has not otherwise caused a material breach under this Agreement;

2.3.2.4. a provision clarifying that the Sublicensee shall only be entitled to sublicense its rights under such Sublicense agreement on the terms set forth in this Section 2.3; and

2.3.2.5. a provision prohibiting the Sublicensee from assigning the Sublicense agreement without the prior written consent of Harvard, except that Sublicensee may assign the Sublicense agreement to an Affiliate of such Sublicensee or to a successor in connection with the merger, consolidation or reorganization of such Sublicensee, or the sale of all or substantially all of its assets or that portion of its business to which the Sublicense agreement relates; provided, however, that any permitted assignee agrees in writing to be bound by the terms of such Sublicense agreement.

2.**3.3. Delivery of Sublicense Agreement.** Licensee shall furnish Harvard with a fully executed copy of any Sublicense agreement, promptly after its execution. Harvard shall keep all such copies in its confidential files and shall use them solely for the purpose of monitoring Licensee's and Sublicensees' compliance with their obligations hereunder and enforcing Harvard's rights under this Agreement.

2.3.4. Breach by Sublicensee. Licensee shall be responsible for any breach of a Sublicense agreement by any Sublicensee that results in or would have constituted a material breach of this Agreement had it been an act or omission by Licensee. Licensee shall either (a) cure such breach in accordance with Section 10.2.2 of this Agreement or (b) enforce its rights by terminating such Sublicense agreement in accordance with the terms thereof.

2.4. Option to Improvements.

2.4.1. Harvard shall promptly provide Licensee with written notice of each Improvement of which it becomes aware, and Licensee agrees to keep the contents of any such notice confidential, and shall not share any such information with any third party without Harvard's prior written consent. With respect to such Improvement, Licensee shall have the right to request, in writing and delivered to Harvard by Licensee within [***] days following Licensee's receipt of Harvard's notice, an option to negotiate a license under Harvard's interest in any patent application Harvard controls to the extent that such Improvement is Covered in such patent application (the "Improvement Patent Rights").

2.4.2. If Licensee notifies Harvard in accordance with Section 2.5.1 above, Licensee shall provide to Harvard, within [***] days following Harvard's receipt of Licensee's notice, a development plan for Licensed Products covered by the Improvement Patent Rights (which shall include specific development milestones), for Harvard's review and approval, not to be unreasonably withheld.

2.4.3. Subject to (i) any legal or contractual obligations of Harvard to Third Parties, but with the understanding that Harvard otherwise shall be obligated to offer such Improvement Patent Rights to Company first for licensing, and (ii) the agreement of each of the inventors of such Improvement, upon the date of Harvard's approval of Licensee's development plan, the Parties shall enter into negotiations for a period of up to [***] days (the "Amendment Negotiation Period") to amend this Agreement to include a grant of rights under Harvard's interest in the Improvement Patent Rights in the Field upon commercially reasonable financial terms (including, for example, an upfront fee, maintenance fees, milestone payments, etc.). [***].

2.5. No Other Grant of Rights. Except as expressly provided herein, nothing in this Agreement will be construed to confer any ownership interest, license or other rights upon Licensee by implication, estoppel or otherwise as to any technology, intellectual property rights, products or biological materials of Harvard, or any other entity, regardless of whether such technology, intellectual property rights, products or biological materials are dominant, subordinate or otherwise related to any Patent Rights.

3. Development and Commercialization.

3.1. Diligence.

3.1.1. General. Licensee shall use Commercially Reasonable Efforts and shall cause its Sublicensees to use Commercially Reasonable Efforts: [***]. [***]. In addition, Licensee, by itself or through its Affiliates or Sublicensees, shall achieve each of the Development Milestones within the time periods specified in Exhibit 1.5. For purposes of this Agreement, "Conditioning" shall mean depletion or ablation of endogenous hematopoietic stem cells and/or progenitor cells in a target tissue, and "Mobilization" shall mean mobilization of hematopoietic stem cells and/or progenitor cells for transplantation.

3.2. Adjustments of Development Plan. Licensee will be entitled, from time to time, to make such adjustments to the then applicable Development Plan as Licensee believes, in its good faith judgment, are needed in order to improve Licensee's ability to meet the Development Milestones.

3.3. Reporting. Within [***] days after the end of each calendar year, Licensee shall furnish Harvard with a written report summarizing its, its Affiliates' and its Sublicensees' efforts during the prior year to develop and commercialize Licensed Products, including: (a) research and development activities; (b) commercialization and/or other distribution efforts; and (c) marketing efforts. Each report must contain a sufficient level of detail for Harvard to assess whether Licensee is in compliance with its obligations under Section 3.1 and a discussion of intended efforts for the then current year. Together with each report, Licensee shall provide Harvard with a copy of the then current Development Plan.

3.4. Failure to Meet Development Milestone; Opportunity to Cure. If Licensee believes that it will not achieve a Development Milestone, it may notify Harvard in writing in advance of the relevant deadline. Licensee shall include with such notice (a) a reasonable explanation of the reasons for such failure (and lack of finances will not constitute reasonable basis for such failure) ("Explanation") and (b) a reasonable, detailed, written plan for promptly achieving a reasonable extended and/or amended milestone ("Plan"). If Licensee so notifies Harvard, but fails to provide Harvard with both an Explanation and Plan, then Licensee will have [***] to meet such Development Milestone. [***]. If Licensee so notifies Harvard and provides Harvard with an Explanation and Plan, both of which are reasonably acceptable to Harvard in its good-faith reasonable discretion, then Exhibit 1.5 will be amended automatically to incorporate the extended and/or amended milestone set forth in the Plan. If Licensee so notifies Harvard and provides Harvard with an Explanation and Plan, but the Explanation is not reasonably acceptable to Harvard in its good-faith reasonable discretion (e.g., but excluding Licensee asserting lack of finances or development preference for a non-Licensed Product without other reasons or factors to be considered), then Licensee will have [***] to meet such Development Milestone. Licensee's failure to do so shall constitute a material breach of this Agreement and Harvard shall have the right to terminate this Agreement immediately upon written notice to Licensee. If Licensee so notifies Harvard and provides Harvard with an Explanation and Plan, but the Plan is

not reasonably acceptable to Harvard in its good-faith reasonable discretion, then Harvard will explain to Licensee why the Plan is not acceptable and provide Licensee with suggestions for an acceptable Plan. Licensee will have one opportunity to provide Harvard with an acceptable Plan within [***] days, during which time Harvard agrees to work with Licensee in its effort to develop an acceptable Plan. If, within such [***] days, Licensee provides Harvard with an acceptable Plan, then Exhibit 1.5 will be amended automatically to incorporate the extended and/or amended milestone set forth in the Plan. If, within such [***] days, Licensee fails to provide an acceptable Plan, then Licensee will have an additional [***] days or until the original deadline of the relevant Development Milestone, whichever is later, to meet such Development Milestone. Licensee's failure to do so shall constitute a material breach of this Agreement and Harvard shall have the right to terminate this Agreement immediately upon written notice to Licensee. For clarity, if Licensee fails to achieve a Development Milestone and does not avail itself of the procedure set forth in this Section 3.4, such failure shall be a material breach that entitles Harvard to proceed under Section 10.2.2.1.

4. Consideration for Grant of License.

4.1. License Issuance Fee. Licensee shall pay Harvard [***]

4.2. Equity.

4.2.1. Issuance.

As partial consideration for the license granted hereunder and pursuant to a mutually-agreeable stock purchase or subscription agreement, within [***] days after the Effective Date, Licensee shall issue directly to Harvard, MGH and Children's, collectively, 995,000 shares of Licensee's common stock, representing [***] of Licensee's capital stock on a Fully Diluted Basis (as defined below) after giving effect to such issuance. Licensee shall issue to each Institution that number of shares set forth beside such Institution's name in Exhibit 4.2.1 hereto. If Licensee issues more than an aggregate of [***] of its Series A Preferred Stock, then, until Licensee has issued Series A Preferred Stock in exchange for an aggregate of [***] of cash investment, Licensee shall issue an additional number of shares of Licensee's common stock to the Institutions in proportion to their stockholdings in Licensee, as necessary to cause the Institutions' collective equity ownership to equal [***] of the issued and outstanding capital stock of Licensee calculated on a Fully Diluted Basis, (any such grant of additional shares of common stock, the "Anti-Dilution Adjustment"). All shares of common stock issued to the Institutions pursuant to the two foregoing sentences are referred to herein as the "Shares." In no event shall the Anti-Dilution Adjustment result in the Institutions receiving additional shares of common stock as a result of Licensee issuing shares of preferred stock that are not shares of its Series A Preferred Stock. For purposes of this Section 4.2, "Fully Diluted Basis" shall mean, as of a specified date, the number of shares of common stock of Licensee then-outstanding (assuming conversion of all outstanding stock other than common stock into common stock), plus the number of shares of common stock of Licensee issuable upon exercise or conversion of then-outstanding convertible securities, options, rights or warrants of Licensee (which shall be determined without regard to whether such securities are then vested, exercisable or convertible), plus the number of shares of common stock of Licensee that would be outstanding or acquirable, directly or indirectly, upon the issuance (and exercise, conversion or exchange, if applicable) of

all securities reserved or otherwise intended for future issuance under any stock purchase, stock option or other compensatory benefit plan or arrangement of Licensee; and "Series A Preferred Stock" shall mean those shares of preferred stock of Licensee issued, in one or more tranches, in exchange for investment of up to [***], pursuant to that certain Series A Preferred Stock Purchase Agreement entered into by Licensee on or about the Effective Date of this Agreement, which agreement shall be in form and substance substantially the same as that draft provided to Harvard by Licensee prior to the Effective Date. Licensee represents and warrants that the Shares have the rights and obligations set forth in the Certificate of Incorporation and Bylaws of Licensee in effect as of the effective date of the Series A Preferred Stock Purchase Agreement, which such documents shall be in the same form, without modification, amendment or supplement, as those provided to Harvard prior to the Effective Date. Harvard shall become a party to the Stockholders Agreement entered into in connection with the issuance of the Series A Preferred Stock for purposes of the board composition section and the drag-along right. In connection with the issuance of the Series A Preferred Stock, each Institution shall have the right to review and enter into any agreement (e.g., stockholders agreement, investors rights agreement, right of first refusal and co-sale agreement, etc.) to the same extent that any other owner of common stock of Licensee has such rights regarding any such agreement.

4.2.2. Representations and Warranties. Licensee represents and warrants to the Institutions that, upon each issuance of the Shares:

4.2.2.1. the pro forma capitalization table as attached at Exhibit 4.2.2.1 reflecting the initial issuance of Shares pursuant to Section 4.2.1, and as updated and provided to Harvard by Licensee upon issuance of any additional Shares in connection with an Anti-Dilution Adjustment, as the case may be (the "Cap Table"), sets forth all of the capital stock of Licensee on a Fully-Diluted Basis as of the date of issuance of such Shares;

4.2.2.2. other than as set forth in the Cap Table, as attached hereto at Exhibit 4.2.2.1 as of the Effective Date, and as updated as of the date of each issuance of the Shares, there are no outstanding shares of capital stock, convertible securities, outstanding warrants, options or other rights to subscribe for, purchase or acquire from Licensee any capital stock of Licensee and there are no contracts or binding commitments providing for the issuance of, or the granting of rights to acquire, any capital stock of Licensee or under which Licensee is, or may become, obligated to issue any of its securities; and

4.2.2.3. the Shares, when issued pursuant to the terms hereof, shall, upon such issuance, be duly authorized, validly issued, fully paid and nonassessable.

4.3. Annual License Maintenance Fees. Licensee shall pay Harvard annual license maintenance fees as follows:

4.3.1. [***] for [***];

4.3.2. [***] for [***];

4.3.3. [***] for [***].

Each such fee shall be due and payable on January 15th of the calendar year to which such fee applies.

Each annual license maintenance fee shall be creditable against any royalty amounts payable under Section 4.5 below with respect to Licensed Products sold in the same calendar year that such annual license maintenance fee was due.

4.4. Milestone Payments.

4.4.1. Licensee shall pay Harvard the following milestone payments with respect to only the first two Licensed Products under this Agreement to reach each milestone, regardless of whether such milestone is achieved by Licensee or any Affiliate, Sublicensee or licensee of Licensee. The amounts shown below are applicable for Type I Licensed Products, and the applicable milestone payments shall each be reduced by [***] in the case of any Type II Licensed Product:

4.4.1.1. [***];

4.4.1.2. [***];

4.4.1.3. [***];

4.4.1.4. [***];

4.4.1.5. [***]; and

4.4.1.6. [***].

4.4.2. Licensee shall notify Harvard in writing within [***] days following the achievement of each milestone described in Section 4.3.1, and shall make the appropriate milestone payment within [***] days after the achievement of such milestone.

4.4.3. The milestones set forth in Section 4.4.1.1-4.4.1.3 are intended to be successive. If a Licensed Product is not required to undergo the event associated with a particular milestone for a Licensed Product ("Skipped Milestone"), such Skipped Milestone will be deemed to have been achieved upon the achievement by such Licensed Product of the next successive milestone set forth in Section 4.4.1.1-4.4.1.3 or any milestone set forth in Sections 4.4.1.4-4.4.1.6 ("Achieved Milestone"). Payment for any Skipped Milestone that is owed in accordance with the provisions of this Section 4.4 shall be due within [***] days after the achievement of the Achieved Milestone.

4.4.4. If Licensee or any of its Affiliates receives Non-Royalty Income with respect to the achievement of any milestone listed in Section 4.4.1, such amounts payable by Licensee to Harvard under this Section 4.4 with respect to such milestone may be deducted from the aggregate amount of Non-Royalty Income on which Licensee must pay fees to Harvard under Section 4.6.

4.5. Royalty on Net Sales.

4.5.1. Type I Licensed Product Rate. Licensee shall pay Harvard an amount equal to [***] of Net Sales of Type I Licensed Products on a country-by-country basis made at any time prior to the expiration of the last to expire Valid Claim in the applicable country covering or claiming the composition, manufacture, sale or use of such Type I Licensed Product.

4.5.2. Type II Licensed Product Rate. Licensee shall pay Harvard an amount equal to [***] of Net Sales of Type II Licensed Products on a country-by-country basis for a period of [***] from the date of the First Commercial Sale of such Licensed Product in such country (each, a "Type II Royalty Period"). For clarity, the Parties hereby agree that if a Licensed Product ceases to be a Type I Licensed Product in such country due to expiration of Patent Rights prior to the end of the [***] period following First Commercial Sale of such Licensed Product in such country, such Licensed Product shall thereafter be subject to the royalty terms set forth in this Section 4.5.2 regarding Type II Licensed Products, and Licensee will pay Harvard royalties on Net Sales of such Licensed Product in accordance with this Section 4.5.2, until the expiration of the applicable [***] period, measured as [***] from the date of the First Commercial Sale of such Licensed Product in such country.

4.5.3. Third Party Royalty Set-Off. If Licensee obtains a license from a third party to an Infringed Patent or a license from a third party to any Infringed Patent that is licensed together with any other pending or issued patents or know-how after arm's length negotiations, it may offset [***] of any running royalty payments due thereunder with respect to sales of Type I Licensed Products that, without such third party license would infringe such Infringed Patent, against the royalty payments that are due to Harvard with respect to Net Sales of such Type I Licensed Products, on a country-by-country basis; provided that in no event shall (a) the royalty payments to Harvard with respect to such Type I Licensed Products be reduced by more than [***] of the amount otherwise due (i.e. an effective [***] royalty rate), and (b) the percentage offset that Licensee is entitled to make against royalty payments due to Harvard be greater than any percentage offset that Licensee is entitled to make against royalty payments due to such third party licensor on account of royalty payments made to Harvard with respect to such Type I Licensed Product.

4.5.4. Patent Challenge. If Licensee, its Affiliate or a Sublicensee ("Challenging Party") commences a legal action in which it challenges the validity, enforceability or scope of any of the Patent Rights (a "Challenge Proceeding"), the royalty rate specified in Sections 4.5.1 and 4.5.2 will be doubled with respect to Net Sales of Licensed Products that are sold during the pendency of such Challenge Proceeding. If the outcome of such Challenge Proceeding is a determination against the Challenging Party, (a) the royalty rate specified in Sections 4.5.1 with respect to Net Sales of Licensed Products that are covered by the Patent Rights that are the subject of such Challenge Proceeding shall remain at such doubled rate and (b) Licensee shall reimburse Harvard for all expenses incurred by Harvard (including reasonable attorneys' fees) in connection with such Challenge Proceeding. If the outcome of such Challenge Proceeding is a determination in favor of the Challenging Party, Licensee will have no right to recoup any royalties paid before or during the pendency of such Challenge Proceeding.

4.5.5. Bad Debt. If, after exercising good faith, commercially reasonable collection efforts for at least two Calendar Quarters after the Calendar Quarter in which Net Sales are made for which Licensee is unable to collect any amount that it has billed or invoiced with respect to such Net Sales for which it has already paid royalties under Sections 4.5.1 or 4.5.2, Licensee shall be entitled to deduct the amount of such royalties with respect to such uncollected amount from the royalty payments due under Sections 4.5.1 and 4.5.2 in the next succeeding (third) Calendar Quarter, which deduction shall be set forth in the corresponding report under Section 5.1 below. If, at any time after such deduction Licensee does collect on the Net Sales for which such deduction was made, such collected amount shall be included as Net Sales in the Calendar Quarter in which they are collected and Licensee shall pay Harvard royalties thereon accordingly.

4.6. Non-Royalty Income. Licensee will pay Harvard an amount equal to (a) [***] of all Non-Royalty Income derived under Sublicenses and Strategic Partnerships entered into prior to the submission of the first IND for a Licensed Product, (b) [***] of all Non-Royalty Income derived under Sublicenses and Strategic Partnerships entered into after submission of the first IND for a Licensed Product and before enrollment of the first patient in a Phase 2 Clinical Trial, and (c) [***] of all Non-Royalty Income derived under Sublicenses and Strategic Partnerships entered into after enrollment of the first patient in a Phase 2 Clinical Trial. For clarity, this section and the requirements for the payment of Non-Royalty Income shall not apply to any M&A Transactions.

5. Reports; Payments; Records.

5.1. Reports and Payments.

5.1.1. Reports. Within [***] days after the conclusion of each Calendar Quarter commencing with the first Calendar Quarter in which Net Sales are generated or Non-Royalty Income is received, Licensee shall deliver to Harvard a report containing the following information (in each instance, with a Licensed Product-by-Licensed Product and country-by-country breakdown):

5.1.1.1. [***];

5.1.1.2. [***];

5.1.1.3. [***];

5.1.1.4. [***];

5.1.1.5. [***]; and

5.1.1.6. [***].

Each such report shall be certified on behalf of Licensee as true, correct and complete in all material respects. If no amounts are due to Harvard for a particular Calendar Quarter, the report shall so state.

5.1.2. Payment. Within [***] days after the end of each Calendar Quarter, Licensee shall pay Harvard all amounts due with respect to Net Sales and Non-Royalty Income for the applicable Calendar Quarter.

5.2. Payment Currency. All payments due under this Agreement will be paid in U.S. Dollars. Conversion of foreign currency to U.S. Dollars will be made at the conversion rate existing in the United States (as reported in the *Wall Street Journal)* on the last working day of the applicable Calendar Quarter. Such payments will be without deduction of exchange, collection or other charges.

5.3. Records. Licensee shall maintain, and shall cause its Affiliates and Sublicensees to maintain, complete and accurate records of Licensed Products that are made, used, sold, leased or transferred under this Agreement, any amounts payable to Harvard in relation to such Licensed Products, and all Non-Royalty Income received by Licensee and its Affiliates, which records shall contain sufficient information to permit Harvard to confirm the accuracy of any reports or notifications delivered to Harvard under Section 5.1. Licensee, its Affiliates and/or its Sublicensees, as applicable, shall retain such records relating to a given Calendar Quarter for at least [***] years after the conclusion of that Calendar Quarter, during which time Harvard will have the right, at its expense, to cause an independent, certified public accountant (or, in the event of a non-financial audit, other appropriate auditor) to inspect such records during normal business hours for the purposes of verifying the accuracy of any reports and payments delivered under this Agreement and Licensee's compliance with the terms hereof. Such accountant or other auditor, as applicable, shall not disclose to Harvard any information other than information relating to the accuracy of reports and payments delivered under this Agreement. The parties shall reconcile any underpayment or overpayment within [***] days after the accountant delivers the results of the audit. If any audit performed under this Section 5.3 reveals an underpayment in excess of [***] in any calendar year, Licensee shall reimburse Harvard for all amounts incurred in connection with such audit. Harvard may exercise its rights under this Section 5.3 [***] and only with reasonable prior notice to the audited entity.

5.4. Late Payments. Any payments by Licensee that are not paid on or before the date such payments are due under this Agreement will bear interest at the lower of (a) [***] per month and (b) the maximum rate allowed by law. Interest will accrue beginning on the first day following the due date for payment and will be compounded quarterly. Payment of such interest by Licensee shall not limit, in any way, Harvard's right to exercise any other remedies Harvard may have as a consequence of the lateness of any payment.

5.5. Payment Method. Each payment due to Harvard under this Agreement shall be paid by check or wire transfer of funds to Harvard's account in accordance with written instructions provided by Harvard. If made by wire transfer, such payments shall be marked so as to refer to this Agreement.

5.6. Withholding and Similar Taxes. All amounts to be paid to Harvard pursuant to this Agreement shall be without deduction of exchange, collection, or other charges, and, specifically, without deduction of withholding or similar taxes or other government imposed fees or taxes, except as permitted in the definition of Net Sales.

5.7. Licensee acknowledges that policies of the Institutions and affiliated organizations, relating to, inter alia, conflicts of interest and intellectual property, may affect certain direct and indirect arrangements between inventors and Licensee or related organizations. During the Term, to the extent Licensee becomes actually aware, Licensee shall notify the inventor's Institution in writing at least [***] days before, or immediately thereafter if Licensee or its subsidiaries plans to enter or enters into any agreement other than this Agreement with or involving the inventors of the Patent Rights, or members or staff of their respective laboratories, whether relating to sponsored research, consulting, board membership, securities, or otherwise. Licensee's notice to each such Institution shall include a detailed description of all proposed terms and conditions. Licensee shall not enter into such an agreement if it would violate such policies unless the terms and conditions of the agreement have been duly approved by the applicable Institution or its Affiliates pursuant to such policies.

6. Patent Filing, Prosecution and Maintenance.

6.1. Control. Harvard will be responsible for the preparation, filing, prosecution, protection, defense and maintenance of all Patent Rights, using independent patent counsel reasonably acceptable to Licensee. Harvard will: (a) instruct such patent counsel to furnish the Licensee with copies of all correspondence and office actions relating to the Patent Rights from or with the United States Patent and Trademark Office (USPTO) and any other patent office, as well as copies of all proposed responses to such correspondence and office actions in time for Licensee to review and provide comments and input on such response; (b) give Licensee an opportunity to review and provide comments and input on the text of each patent application before filing; (c) consult with Licensee with respect thereto; (d) supply Licensee with a copy of the application as filed, together with notice of its filing date and serial number; and (e) keep Licensee advised of the status of actual and prospective patent filings. Harvard shall give Licensee the opportunity to provide comments and input on and make requests of Harvard concerning the preparation, filing, prosecution, protection, defense and maintenance of the Patent Rights, and shall seriously consider all such comments, input and requests; however, final decision-making authority shall vest in Harvard.

6.2. Expenses. Subject to Section 6.3 below, Licensee shall reimburse Harvard for all documented, out-of-pocket expenses incurred by the Institutions after the Effective Date pursuant to this Article 6 ("**Ongoing Patent Expenses**") within [***] days after the date of each invoice from Harvard for such expenses. In addition, within [***] days after the Effective Date, Licensee shall reimburse Harvard for all documented, out-of-pocket expenses incurred by the Institutions prior to the Effective Date with respect to the preparation, filing, prosecution, protection and maintenance of Patent Rights ("**Back Patent Expenses**"), as well as an amount equal to [***] as reimbursement for out of pocket costs incurred by Harvard in connection with inventorship analysis regarding certain Patent Rights. As of the Effective Date, such Back Patent Expenses total approximately [***]. For purposes of this Section 6.2, expenses with respect to the preparation, filing, prosecution, protection and maintenance of Patent Rights authorized prior to the Effective Date for which Harvard has not yet received a bill from outside counsel as of the Effective Date shall be deemed incurred after the Effective Date and included in Ongoing Patent Expenses.

6.3. Abandonment. If Licensee decides that it does not wish to pay for the preparation, filing, prosecution, protection or maintenance of any Patent Rights in a particular country ("Abandoned Patent Rights"), Licensee shall provide Harvard with prompt written notice of such election. Upon receipt of such notice by Harvard, Licensee shall be released from its obligation to reimburse Harvard for the expenses incurred thereafter as to such Abandoned Patent Rights; provided, however, that expenses authorized prior to the receipt by Harvard of such notice shall be deemed incurred prior to the notice. In the event of Licensee's abandonment of any Patent Rights, any license granted by Harvard to Licensee hereunder with respect to such Abandoned Patent Rights will terminate, and Licensee will have no rights whatsoever to exploit such Abandoned Patent Rights. Harvard will then be free, without further notice or obligation to Licensee, to grant rights in and to such Abandoned Patent Rights to third parties.

6.4. Small Entity Designation. If Licensee, its Affiliates, any Sublicensee and/or any holder of an option to obtain a Sublicense does not qualify, or at any point during the Term ceases to qualify, as an entity entitled to pay lesser fees as provided by the USPTO (i.e., a "small entity") or the patent office of any other country, Licensee shall so notify Harvard immediately, in order to enable Harvard to comply with regulations regarding payment of fees with respect to Patent Rights..

6.5. Marking. Licensee shall, and shall cause its Affiliates and Sublicensees to, mark all Licensed Products sold or otherwise disposed of in such a manner as to conform with the patent laws and practice of the country to which such products are shipped or in which such products are sold for purposes of ensuring maximum enforceability of Patent Rights in such country.

7. Enforcement of Patent Rights.

7.1. Notice. In the event either party becomes aware of any possible or actual infringement of any Patent Rights with respect to Licensed Products in the Field (an "Infringement"), that party shall promptly notify the other party and provide it with details regarding such Infringement.

7.2. Suit by Licensee. Licensee shall have the first right, but not the obligation, to take action in the prosecution, prevention, or termination of any Infringement. Before Licensee commences an action with respect to any Infringement, Licensee shall consider in good faith the views of the Institutions and potential effects on the public interest in making its decision whether to take such action. Should Licensee elect to bring suit against an infringer, Licensee shall keep the Institutions reasonably informed of the progress of the action and shall give each Institution a reasonable opportunity in advance to consult with Licensee and offer its views about major decisions affecting the litigation. Licensee shall give careful consideration to those views, but shall have the right to control the action; provided, however, that if Licensee fails to defend in good faith the validity and/or enforceability of the Patent Rights in the action or, or if Licensee's license to a Valid Claim in the suit terminates, Harvard may elect to take control of the action pursuant to Section 7.3. Any and all expenses, including reasonable attorneys' fees, incurred by Harvard with respect to the prosecution, adjudication and/or settlement of such suit, including any related appeals, shall be paid for entirely by Licensee and Licensee shall hold Harvard free, clear and harmless from and against any and all such expenses. The expenses of

such suit or suits that Licensee elects to bring, including any expenses of each Institution incurred in conjunction with the prosecution of such suits or the settlement thereof, shall be paid for entirely by Licensee and Licensee shall hold each Institution free, clear and harmless from and against any and all costs of such litigation, including reasonable attorneys' fees. Licensee shall not compromise or settle such litigation without the prior written consent of each Institution, which consent shall not be unreasonably withheld or delayed. In the event Licensee exercises its right to sue pursuant to this Section 7.2, it shall first reimburse itself out of any sums recovered in such suit or in settlement thereof for all costs and expenses of every kind and character, including reasonable attorneys' fees, necessarily incurred in the prosecution of any such suit. If, after such reimbursement, any funds shall remain from said recovery, then Harvard shall receive an amount equal to [***] of such funds and the remaining [***] of such funds shall be retained by Licensee.

7.3. Suit by Harvard. If Licensee does not take action in the prosecution, prevention, or termination of any Infringement pursuant to Section 7.2 above, and has not commenced negotiations with the infringer for the discontinuance of said Infringement, within ninety (90) days after receipt of notice to Licensee by Harvard of the existence of an Infringement, Harvard may elect to do so. Should Harvard elect to bring suit against an infringer and Licensee is joined as party plaintiff in any such suit, Licensee shall have the right to approve the counsel selected by Harvard to represent Harvard and Licensee, such approval not to be unreasonably withheld. Any and all expenses, including reasonable attorneys' fees, incurred by Licensee with respect to the prosecution, adjudication and/or settlement of such suit, including any related appeals, shall be paid for entirely by Harvard and Harvard shall hold Licensee free, clear and harmless from and against any and all such expenses. Harvard shall not compromise or settle such litigation without the prior written consent of Licensee, which consent shall not be unreasonably withheld or delayed. In the event Harvard exercises its right to sue pursuant to this Section 7.3, it shall first reimburse itself out of any sums recovered in such suit or in settlement thereof for all costs and expenses of every kind and character, including reasonable attorneys' fees, necessarily incurred in the prosecution of any such suit. If, after such reimbursement, any funds shall remain from said recovery, then Licensee shall receive an amount equal to [***] of such funds and the remaining [***] of such funds shall be retained by Harvard.

7.4. Own Counsel. Each party shall always have the right to be represented by counsel of its own selection and at its own expense in any suit instituted under this Article 7 by the other party for Infringement.

7.5. Cooperation. Each party agrees to cooperate fully in any action under this Article 7 that is controlled by the other party, provided that the controlling party reimburses the cooperating party promptly for any costs and expenses incurred by the cooperating party in connection with providing such assistance.

7.6. Declaratory Judgment. If a declaratory judgment action is brought naming Licensee and/or any of its Affiliates or Sublicensees as a defendant and alleging invalidity or unenforceability of any claims within the Patent Rights, Licensee shall promptly notify each Institution in writing and the Institutions may elect, upon written notice to Licensee within thirty (30) days after they each receive notice of the commencement of such action, to take over the sole defense of the invalidity and/or unenforceability aspect of the action at its own expense.

8. Warranties; Limitation of Liability.

8.1. Compliance with Law. Licensee represents and warrants that it will comply, and will ensure that its Affiliates and Sublicensees comply, with all local, state, federal and international laws and regulations relating to the development, manufacture, use, sale and importation of Licensed Products. Without limiting the foregoing, Licensee represents and warrants, on behalf of itself and its Affiliates and Sublicensees, that it shall comply with all United States laws and regulations controlling the export of certain commodities and technical data, including without limitation all Export Administration Regulations of the United States Department of Commerce. Among other things, these laws and regulations prohibit or require a license for the export of certain types of commodities and technical data to specified countries. Licensee hereby gives written assurance that it will comply with, and will cause its Affiliates to comply with (and will contractually obligate its Sublicensees to comply with), all United States export control laws and regulations, that it bears sole responsibility for any violation of such laws and regulations by itself or its Affiliates or Sublicensees, and that it will indemnify, defend, and hold Harvard harmless (in accordance with Section 9.1) for the consequences of any such violation.

8.2. Limited Representation and Disclaimer of other Warranties.

8.2.1. (A) HARVARD HEREBY REPRESENTS TO LICENSEE THAT, AS OF THE EFFECTIVE DATE, TO THE ACTUAL KNOWLEDGE OF THE RESPONSIBLE LICENSING OFFICER(S) AT HARVARD'S OFFICE OF TECHNOLOGY DEVELOPMENT ("OTD"), WITHOUT ANY FURTHER INVESTIGATION OR FURTHER INQUIRY WITHIN HARVARD, HARVARD HAS NOT RECEIVED WRITTEN NOTICE OF ANY PENDING OR THREATENED LAWSUIT OR LEGAL PROCEEDING OR ACTION BY A THIRD PARTY ASSERTING THAT THE PATENT RIGHTS INFRINGE OR MISAPPROPRIATE THE INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY. IN THE EVENT THAT AFTER THE EFFECTIVE DATE, OTD RECEIVES SUCH WRITTEN NOTICE, IT SHALL NOTIFY LICENSEE PROMPTLY.

(B) NOTHING CONTAINED HEREIN SHALL BE DEEMED TO BE A WARRANTY BY HARVARD THAT IT CAN OR WILL BE ABLE TO OBTAIN PATENTS ON PATENT APPLICATIONS INCLUDED IN THE PATENT RIGHTS, OR THAT ANY OF THE PATENT RIGHTS WILL AFFORD ADEQUATE OR COMMERCIALLY WORTHWHILE PROTECTION.

8.2.2. HARVARD MAKES NO WARRANTIES WHATSOEVER AS TO THE COMMERCIAL OR SCIENTIFIC VALUE OF THE PATENT RIGHTS. HARVARD MAKES NO REPRESENTATION THAT THE PRACTICE OF THE PATENT RIGHTS OR THE DEVELOPMENT, MANUFACTURE, USE, SALE OR IMPORTATION OF ANY LICENSED PRODUCT, OR ANY ELEMENT THEREOF, WILL NOT INFRINGE ANY PATENT OR PROPRIETARY RIGHTS.

8.2.3. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN THIS AGREEMENT, NEITHER PARTY MAKES ANY WARRANTY WITH RESPECT TO ANY TECHNOLOGY, PATENTS, GOODS, SERVICES, RIGHTS OR OTHER SUBJECT MATTER OF THIS AGREEMENT AND EACH PARTY HEREBY DISCLAIMS WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT WITH RESPECT TO ANY AND ALL OF THE FOREGOING.

8.3. Limitation of Liability.

8.3.1. Except with respect to matters for which Licensee is obligated to indemnify Harvard under Article 9, neither party will be liable to the other with respect to any subject matter of this Agreement under any contract, negligence, strict liability or other legal or equitable theory for (a) any indirect, incidental, consequential or punitive damages or lost profits or (b) cost of procurement of substitute goods, technology or services. In addition, neither MGH nor Children's, or any of their respective trustees, directors, officers, medical and professional staff, employees and agents be liable to Licensee or any of its Affiliates, Sublicensees or distributors for indirect, special, incidental or consequential damages of any kind arising in any way out of this Agreement or the license rights granted hereunder, however caused and on any theory of liability, including without limitation economic damages or injury to property or lost profits, regardless of whether MGH or Children's shall be advised, shall have other reason to know, or in fact shall know of the possibility of the foregoing.

8.3.2. Except with respect to Harvard's obligations of confidentiality hereunder, or Harvard's willful misconduct under this Agreement, Harvard's aggregate liability for all damages of any kind arising out of or relating to this Agreement or its subject matter under any contract, negligence, strict liability or other legal or equitable theory shall not exceed the amounts paid to Harvard under this Agreement.

9. Indemnification and Insurance.

9.1. Indemnity.

9.1.1. Licensee shall indemnify, defend and hold harmless each of Harvard, Children's and MGH and their current and former directors, governing board members, trustees, officers, faculty, medical and professional staff, employees, students, and agents and their respective successors, heirs and assigns (collectively, the "Indemnitees") from and against any claim, liability, cost, expense, damage, deficiency, loss or obligation of any kind or nature (including reasonable attorneys' fees and other costs and expenses of litigation), based upon, arising out of, or otherwise relating to the practice of any rights as granted by Harvard to Licensee under this Agreement by Licensee, any of its Affiliates or any Sublicensee under any Sublicense, including any cause of action relating to product liability concerning any product, process, or service made, used, sold or performed pursuant to any right or license granted from Harvard to Licensee under this Agreement (collectively, "Claims"), except to the extent that any such Claim is attributable to the gross negligence or willful misconduct of such Indemnitee or the breach by Harvard of any provision of this Agreement. Neither Licensee nor Harvard shall settle any Claim without the prior written consent of the other, which consent shall not be unreasonably withheld.

9.1.2. Licensee shall, at its own expense, provide attorneys reasonably acceptable to the applicable Institution to defend against any actions brought or filed against any Indemnitee hereunder with respect to the subject of indemnity contained herein, whether or not such actions are rightfully brought.

9.2. Insurance.

9.2.1. Beginning at the time any Licensed Product is being commercially distributed or sold (other than for the purpose of obtaining regulatory approvals) by Licensee, or by an Affiliate, Sublicensee or agent of Licensee, Licensee shall, at its sole cost and expense, procure and maintain commercial general liability insurance in amounts not less than $[***] per incident and $[***] annual aggregate and naming the Indemnitees as additional insureds. During clinical trials of any such Licensed Product, Licensee shall, at its sole cost and expense, procure and maintain commercial general liability insurance in such equal or lesser amount as may be consistent with such prudent practices, but in any event no less than $[***] per incident and $[***] annual aggregate, naming the Indemnitees as additional insureds. Such commercial general liability insurance shall provide: (a) product liability coverage and (b) broad form contractual liability coverage for Licensee's indemnification obligations under this Agreement.

9.2.2. If Licensee elects to self-insure all or part of the limits described above in Section 9.2.1 (including deductibles or retentions that are in excess of $[***] annual aggregate) such self-insurance program must be acceptable to Harvard and CRICO/RMF (Harvard's insurer) in their reasonable discretion. The minimum amounts of insurance coverage required shall not be construed to create a limit of Licensee's liability with respect to its indemnification obligations under this Agreement.

9.2.3. Licensee shall provide Harvard with written evidence of such insurance upon request of Harvard. Licensee shall provide Harvard with written notice at least [***] days prior to the cancellation, non-renewal or material change in such insurance. If Licensee does not obtain replacement insurance providing comparable coverage within such [***] day period, Harvard shall have the right to terminate this Agreement effective at the end of such [***] day period without notice or any additional waiting periods.

9.2.4. Licensee shall maintain such commercial general liability insurance beyond the expiration or termination of this Agreement during: (a) the period that any Licensed Product is being commercially distributed or sold by Licensee, or an Affiliate, Sublicensee or agent of Licensee; and (b) a reasonable period after the period referred to in (a) above which in no event shall be less than [***] years.

10. Term and Termination.

10.1. Term. The term of this Agreement shall commence on the Effective Date and, unless earlier terminated as provided in this Article 10, shall continue in full force and effect until the later of [***] (the "Term").

10.2. Termination.

10.2.1. Termination Without Cause. Licensee may terminate this Agreement for any reason (or merely for convenience) upon [***] days prior written notice to Harvard.

10.2.2. Termination for Default.

10.2.2.1. In the event that either party commits a material breach of its obligations under this Agreement and fails to cure that breach within [***] days after receiving written notice thereof, the other party may terminate this Agreement immediately upon written notice to the party in breach.

10.2.2.2. If Licensee defaults in its obligations under Section 9.2 to procure and maintain insurance or, if Licensee has in any event failed to comply with the notice requirements contained therein, then Harvard may terminate this Agreement immediately without notice or additional waiting period.

10.2.2.3. Harvard shall be entitled to terminate this Agreement in accordance with the provisions of Section 3.4.

10.2.3. Bankruptcy. Harvard may terminate this Agreement upon notice to Licensee if Licensee becomes insolvent, is adjudged bankrupt, applies for judicial or extra-judicial settlement with its creditors, makes an assignment for the benefit of its creditors, voluntarily files for bankruptcy or has a receiver or trustee (or the like) in bankruptcy appointed by reason of its insolvency, or in the event an involuntary bankruptcy action is filed against Licensee and not dismissed within [***] days, or if Licensee becomes the subject of liquidation or dissolution proceedings or otherwise discontinues business.

10.3. Effect of Termination.

10.3.1. Termination of Rights. Upon expiration or termination of this Agreement by either party pursuant to any of the provisions of Section 10.2: (a) the rights and licenses granted to Licensee under Article 2 shall terminate, all rights in and to and under the Patent Rights will revert to Harvard and neither Licensee nor its Affiliates may make any further use or exploitation of the Patent Rights; and (b) any existing agreements that contain a Sublicense shall terminate to the extent of such Sublicense; provided, however, that, notwithstanding the foregoing, each Sublicensee that is not at that time in breach of its Sublicense shall have the right to obtain a license from Harvard on substantially the same terms and conditions as set forth herein, which shall not impose any representations, warranties, obligations or liabilities on Harvard that are not included in this Agreement; provided, that (i) the scope of the license granted directly by Harvard to such Sublicensee shall be co-extensive with the scope of the Sublicense granted by Licensee to such Sublicensee, (ii) if the Sublicense granted to such Sublicensee was non-exclusive, such Sublicensee shall not have the right to participate in the prosecution or enforcement of the Patent Rights under the license granted to it directly by Harvard, (iii) if there is more than one Sublicensee, each Sublicensee that is granted a direct license shall be responsible for a pro rata share of the reimbursement due under Section 6.2 of this Agreement (based on the number of direct licenses under the Patent Rights in effect on the date of reimbursement), (iv) the financial terms of such direct license by Harvard shall be

no less favorable to Harvard than the financial terms that apply to Licensee under this Agreement, (v) Harvard shall not have any obligations that are greater than or inconsistent with the obligations of Harvard under this Agreement or the nature of Harvard as an academic and non-profit entity, or any fewer rights than Harvard has under this Agreement, and (vi) all obligations arising prior to execution of such direct license shall remain the responsibility of Licensee and Harvard shall be released from any and all liability relating to such obligations. If any Sublicensee desires to enter into such a direct license, it shall be wholly the responsibility of that Sublicensee to notify Harvard of such desire no later than [***] days after the effective date of termination of this Agreement.

10.3.2. Accruing Obligations. Termination or expiration of this Agreement shall not relieve the parties of obligations accruing prior to such termination or expiration, including obligations to pay amounts accruing hereunder up to the date of termination or expiration. After the date of termination or expiration (except in the case of termination by Harvard pursuant to Section 10.2), Licensee, its Affiliates and Sublicensees (a) may sell Licensed Products then in stock and (b) may complete the production of Licensed Products then in the process of production and sell the same; provided that, in the case of both (a) and (b), Licensee shall pay the applicable royalties and payments to Harvard in accordance with Article 4, provide reports and audit rights to Harvard pursuant to Article 5 and maintain insurance in accordance with the requirements of Section 9.2. The parties agree that the obligations in Section 4.1 (License Fee), Section 4.2 (Equity) and Section 6.2 (Patent Expenses) will accrue immediately upon execution of this Agreement by both parties, regardless of the events, invoice and payment timing details set forth therein.

10.3.3. Regulatory Filings. Licensee shall have the exclusive right to prepare and present all regulatory filings necessary or appropriate in any country and to obtain and maintain any regulatory approval required to market Licensed Products in any such country. Licensee shall solely own all right, title and interest in and to all such regulatory approvals and filings; provided, however, that in the event Licensee terminates this Agreement pursuant to Section 10.2.1 or Harvard terminates this Agreement pursuant to any of the provisions of Section 10.2, Licensee and Harvard will, for a period of [***] days thereafter, exclusively negotiate in good faith for the terms to be applicable to a potential license or assignment agreement, under which Licensee would license or assign to Harvard and provide Harvard with the right to reference, cross-reference, review, have access to, incorporate and use all documents and other materials filed by or on behalf of Licensee and its Affiliates with any Regulatory Authority in furtherance of applications for regulatory approval in the relevant country with respect to Licensed Products; provided, however, that neither Party shall be under any obligation to enter into any such license or assignment agreement, and Licensee shall not be required to grant any such rights to Harvard unless the Parties enter into a mutually acceptable definitive agreement, at the sole discretion of each Party.

10.4. Survival. The parties' respective rights, obligations and duties under Articles 5, 9, 10 and 11 and Sections 4.2, 4.5.2, 4.5.4, 8.2 and 8.3, as well as any rights, obligations and duties which by their nature extend beyond the expiration or termination of this Agreement, shall survive any expiration or termination of this Agreement. In addition, Licensee's obligations under Section 4.6 with respect to Sublicenses granted and Strategic Partnerships entered into prior to expiration or termination of the Agreement shall survive such expiration or termination.

11. Miscellaneous.

11.1. Preference for United States Industry. During the period of exclusivity of this license in the United States, Licensee shall comply with 37 C.F.R. § 401.14 (i) or any successor rule or regulation.

11.2. No Security Interest. Licensee shall not enter into any agreement under which Licensee grants to or otherwise creates in any third party a security interest in this Agreement or any of the rights granted to Licensee herein. Any grant or creation of a security interest purported or attempted to be made in violation of the terms of this Section 11.2 shall be null and void and of no legal effect.

11.3. Use of Name. Except as provided below, Licensee shall not, and shall ensure that its Affiliates and Sublicensees shall not, use or register the name of any Institution (alone or as part of another name) or any logos, seals, insignia or other words, names, symbols or devices that identify any Institution or any Institution school, unit, division or affiliate ("Institution Names") for any purpose except with the prior written approval of, and in accordance with restrictions required by, the applicable Institution. Without limiting the foregoing, Licensee shall, and shall ensure that its Affiliates and Sublicensees shall, cease all use of Institution Names on the termination or expiration of this Agreement except as otherwise approved by each applicable Institution. This restriction shall not apply to any information required by law to be disclosed to any governmental entity.

11.4. Entire Agreement. This Agreement is the sole agreement with respect to the subject matter hereof and except as expressly set forth herein, supersedes all other agreements and understandings between the parties with respect to the same.

11.5. Notices. Unless otherwise specifically provided, all notices required or permitted by this Agreement shall be in writing and may be delivered personally, or may be sent by facsimile, expedited delivery or certified mail, return receipt requested, to the following addresses, unless the parties are subsequently notified of any change of address in accordance with this Section 11.5:

If to Licensee (other than invoices):	Magenta Therapeutics, Inc. [***]
If to Licensee (invoices only):	Magenta Therapeutics, Inc [***]
If to Harvard:	Office of Technology Development Harvard University [***] Attn.: Chief Technology Development Officer

Any notice shall be deemed to have been received as follows: (a) by personal delivery or expedited delivery, upon receipt; (b) by facsimile, one business day after transmission or dispatch; (c) by certified mail, as evidenced by the return receipt. If notice is sent by facsimile, a confirming copy of the same shall be sent by mail to the same address.

11.6. Governing Law and Jurisdiction. This Agreement will be governed by, and construed in accordance with, the substantive laws of the Commonwealth of Massachusetts, without giving effect to any choice or conflict of law provision, except that questions affecting the construction and effect of any patent shall be determined by the law of the country in which the patent shall have been granted. Any action, suit or other proceeding arising under or relating to this Agreement (a "Suit") shall be brought in a court of competent jurisdiction in the Commonwealth of Massachusetts, and the parties hereby consent to the sole jurisdiction of the state and federal courts sitting in the Commonwealth of Massachusetts. Each party agrees not to raise any objection at any time to the laying or maintaining of the venue of any Suit in any of the specified courts, irrevocably waives any claim that Suit has been brought in any inconvenient forum and further irrevocably waives the right to object, with respect to any Suit, that such court does not have any jurisdiction over such party.

11.7. Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties and their respective legal representatives, successors and permitted assigns.

11.8. Headings. Section and subsection headings are inserted for convenience of reference only and do not form a part of this Agreement.

11.9. Counterparts. The parties may execute this Agreement in two or more counterparts, each of which shall be deemed an original, but both of which together shall constitute one and the same instrument. Transmission by facsimile or electronic mail of an executed counterpart of this Agreement shall be deemed to constitute due and sufficient delivery of such counterpart. If by electronic mail, the executed Agreement must be delivered in a .pdf format.

11.10. Amendment; Waiver. This Agreement may be amended, modified, superseded or canceled, and any of the terms may be waived, only by a written instrument executed by each party or, in the case of waiver, by the party waiving compliance. The delay or failure of either party at any time or times to require performance of any provisions hereof shall in no manner affect the rights at a later time to enforce the same. No waiver by either party of any condition or of the breach of any term contained in this Agreement, whether by conduct, or otherwise, in any one or more instances, shall be deemed to be, or considered as, a further or continuing waiver of any such condition or of the breach of such term or any other term of this Agreement.

11.11. No Agency or Partnership. Nothing contained in this Agreement shall give either party the right to bind the other, or be deemed to constitute either party as agent for or partner of the other or any third party.

11.12. Assignment and Successors. This Agreement may not be assigned by either party without the consent of the other, which consent shall not be unreasonably withheld, conditioned or delayed, except that Licensee may, without the consent of Harvard, assign this Agreement, in its entirety, and the rights, obligations and interests of Licensee hereunder (i) to any purchaser of all of the equity of Licensee, or (ii) to any successor corporation resulting from

any merger or consolidation of Licensee with or into such corporation, or (iii) to any purchaser of all or substantially all of the assets of Licensee; provided, in each case, that the assignee agrees in writing to be bound by the terms of this Agreement. Any assignment purported or attempted to be made in violation of the terms of this Section 11.12 shall be null and void and of no legal effect. For clarity, a restructuring or reorganization of Licensee in which the stockholders of Licensee immediately before such transaction directly or indirectly beneficially own (as such term is used in Rule 13d-3 under the Securities Exchange Act of 1934, as amended), immediately thereafter, at least a majority of the outstanding equity of Licensee or the entity that acquires Licensee's assets or stock shall not be deemed to be an assignment of this Agreement for any purpose hereunder.

11.13. Force Majeure. Except for monetary obligations hereunder, neither party will be responsible for delays resulting from causes beyond the reasonable control of such party, including fire, explosion, flood, war, strike, or riot, provided that the nonperforming party uses commercially reasonable efforts to avoid or remove such causes of nonperformance and continues performance under this Agreement with reasonable dispatch whenever such causes are removed.

11.14. Interpretation. Each party hereto acknowledges and agrees that: (a) it and/or its counsel reviewed and negotiated the terms and provisions of this Agreement and has contributed to its revision; (b) the rule of construction to the effect that any ambiguities are resolved against the drafting party shall not be employed in the interpretation of this Agreement; (c) the terms and provisions of this Agreement shall be construed fairly as to both parties hereto and not in favor of or against either party, regardless of which party was generally responsible for the preparation of this Agreement; and (d) the use of "include," "includes," or "including" herein shall not be limiting and "or" shall not be exclusive.

11.15. Severability. If any provision of this Agreement is or becomes invalid or is ruled invalid by any court of competent jurisdiction or is deemed unenforceable, it is the intention of the parties that the remainder of this Agreement shall not be affected.

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives as of the date first written above.

President and Fellows of Harvard College

By: /s/ Isaac T. Kohlberg

Name: Isaac T. Kohlberg

Title: Senior Associate Provost
Chief Technology Development Officer
Office of Technology Development
Harvard University

Magenta Therapeutics, Inc.

By: /s/ Jason Gardner

Name: Jason Gardner

Title: CEO

Exhibit 1.5
Development Milestones

With respect to a Licensed Product for Mobilization:

Initiation of IND-enabling Preclinical Toxicology Study of a Licensed Product within [***] of the Effective Date;

Submission of an IND for a Licensed Product to [***] within [***] of the Effective Date;

Enrollment of the first subject in the first Phase 2 Clinical Study, within [***] of IND filing;

Enrollment of the first subject in the first Phase 3 Clinical Study of a Licensed Product within [***] after initiation of the first Phase 2 Clinical Study; and

Submission of a Licensed Product for Marketing Authorization in [***] within [***] from initiation of the first Phase 3 Clinical Study for such Licensed Product or [***] from the Effective Date.

With respect to a Licensed Product for Conditioning:

Initiation of IND-enabling Preclinical Toxicology Study of a Licensed Product within [***] of the Effective Date;

Submission of an IND for a Licensed Product to [***] within [***] of the Effective Date;

Enrollment of the first subject in the first Phase 2 Clinical Study, within [***] of IND filing;

Enrollment of the first subject in the first Phase 3 Clinical Study of a Licensed Product within [***] initiation of the first Phase 2 Clinical Study; and

Submission of a Licensed Product for Marketing Authorization in [***] within [***] from initiation of the first Phase 3 Clinical Study for such Licensed Product or [***].

Exhibit 1.6
Development Plan

See attached.

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

[***]

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

[***]

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Exhibit 1.18
Patent Rights

Harvard Case No.	Application or Patent No.	Filing or Issue Date	Title
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

Exhibit 4.2.1

Initial Equity Issuance: Shares/Percentages

[***]

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

Exhibit 4.2.2.1

Capitalization Table

See attached.

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

[***]

Exhibit 10.7

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

Execution Version

LICENSE AGREEMENT

THIS LICENSE AGREEMENT ("**Agreement**") is made effective as of the 3rd day of April, 2017 (the "**Effective Date**"), by and between Magenta Therapeutics, Inc., a Delaware corporation with its principal place of business located at 50 Hampshire Street, 8th floor, Cambridge, MA 02139 ("**LICENSEE**") and Novartis International Pharmaceutical Ltd., a for-profit corporation with its principal place of business at Lichtstrasse 35, CH-4056 Basel, Switzerland ("**NOVARTIS**"). LICENSEE and NOVARTIS may, from time-to-time, be individually referred to as a "**Party**" and collectively referred to as the "**Parties**".

RECITALS

WHEREAS, NOVARTIS Controls the Licensed Technology (hereinafter defined); and

WHEREAS, LICENSEE wishes to obtain, and NOVARTIS wishes to grant, certain licenses under the Licensed Technology on the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the mutual agreements and covenants set forth herein and other good and valuable consideration, the receipt and sufficiency of which the Parties hereby acknowledge, the Parties, intending to be legally bound hereby, agree to the foregoing and as follows:

1. DEFINITIONS

1.1 "**Accounting Standards**" means, with respect to LICENSEE, United States Generally Accepted Accounting Principles, and, with respect to Novartis, International Financial Reporting Standards, in both cases as consistently applied throughout the Party's organization. Each Party will promptly notify the other Party in the event that it changes the Accounting Standards pursuant to which its records relating to this Agreement are maintained; *provided, however,* that each Party may only use internationally recognized accounting principles *(e.g.,* IFRS, US GAAP, *etc.).*

1.2 "**Affiliate**" means, with respect to a Party, any Person that controls, is controlled by, or is under common control with that Party. For the purpose of this definition, "control" shall refer to: (a) the possession, directly or indirectly, of the power to direct the management or policies of an entity, whether through the ownership of voting securities, by contract or otherwise; or (b) the ownership, directly or indirectly, of fifty percent (50%) or more of the voting securities of such entity.

1.3 "**Applicable Laws**" means all applicable laws, statutes, rules, regulations and guidelines, including all good manufacturing practices and all applicable standards or guidelines promulgated by the appropriate Regulatory Authority.

1.4 "**Approval Application**" means a BLA or similar application or submission for a Product filed with a Regulatory Authority in a country or group of countries to obtain marketing approval for a biological or pharmaceutical product in that country or group of countries.

1.5 "**Biologics License Application**" or "**BLA**" means a Biologics License Application submitted to the FDA under subsection (a) of Section 351 of the PHSA or any corresponding foreign application in the Territory, including, with respect to the European Union, a marketing authorization application filed with the EMA pursuant to the centralized approval procedure or with the applicable Regulatory Authority of a country in Europe with respect to the mutual recognition or any other national approval.

1.6 "**BLA-Enabling Clinical Trial**" means (a) a Phase III Clinical Trial, or (b) a Clinical Trial regarding the efficacy and safety of a Product, which is designed to demonstrate statistically whether such Product is effective and safe for use in a particular Indication in a manner that generates data sufficient (by itself or together with other Clinical Trials) to permit the submission of a BLA for such Product, consistent with regional regulatory requirement for an accelerated approval pathway. To the extent that such approval is associated with conditional approval in Japan for a hematology oncology indication, which may be granted on the temporary basis with Phase 2 data, and that a further confirmatory Clinical Trial is required before the full approval can be granted in Japan, then 50% of the BLA-enabling Clinical Trial milestone will be due sixty (60) days after receipt of such conditional approval, with the other 50% becoming due within sixty (60) days after the date that the database for the confirmatory Clinical Trial has been locked.

1.7 "**Business Day**" means any day other than a Saturday, a Sunday or a day on which commercial banks located in Boston, Massachusetts are authorized or required by law to remain closed.

1.8 "**Calendar Quarter**" means the respective periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31.

1.9 "**Calendar Year**" means any twelve (12) month period commencing on January 1.

1.10 "**Change in Control**" of a Person means (a) a merger, consolidation, reorganization, amalgamation, arrangement, share exchange, tender or exchange offer, private purchase, business combination, recapitalization or other transaction involving such Person that results in the stockholders of such Person immediately prior thereto ceasing to hold at least fifty percent (50%) of the outstanding shares, or less than fifty percent (50%) of the combined voting power of the surviving entity or the ultimate parent entity of the surviving entity immediately after such transaction, (b) a transaction or series of related transactions in which a Third Party, together with its Affiliates, becomes the beneficial owner of fifty percent (50%) or more of the combined voting power of the outstanding securities of such Person, (c) the sale or other transfer (in one transaction or a series of related transactions) to a Third Party of all or substantially all of such Person's assets (or, in the case of a Party, all or substantially all of such Party's business to which this Agreement relates), or (d) the adoption of a plan relating to the liquidation or dissolution of a Person, other than in connection with a corporate reorganization (without limitation of clause (a) above).

1.11 "**Clinical Trials**" means Phase I Clinical Trials, Phase II Clinical Trials, Phase III Clinical Trials or Phase IV Clinical Trials.

1.12 "**Combination Product**" means a therapeutic product that includes, incorporates, or embodies a Product together with at least one (1) Other Active Ingredient.

1.13 "**Commercialize**" or "**Commercialization**" means to manufacture for sale, market, promote, otherwise offer for sale, distribute or sell.

1.14 "**Commercially Reasonable Efforts**" means [***].

1.15 "**Compounds**" means the compounds designated by NOVARTIS as [***] and [***], together with such other compounds as may be disclosed in the Licensed Patent Rights that claim [***] and [***].

1.16 "**Control**" or "**Controlled**" means, with respect to any Intellectual Property Rights, the legal authority or right (whether by ownership, license or otherwise other than pursuant to this Agreement) of a Party to grant a license or a Sublicense of or under such Intellectual Property Rights to the other Party without breaching the terms of any agreement with a Third Party.

1.17 "**Covered IP**" means any Intellectual Property Rights that are related to and reasonably necessary for the Use of the Compounds or the Development, manufacture or Commercialization of any Product to the extent such activities are undertaken in connection with activities under this Agreement commencing with the manufacturing of such Compounds and ending with the packaging of cryopreserved Product (including all activities that would be undertaken between such commencing and ending activities). For the avoidance of doubt, Covered IP does not include Intellectual Property Rights solely for Use in conditioning regimens or transfusion protocols.

1.18 "**Develop**" or "**Development**" means all research, development and regulatory activities regarding a Product, including the Use of a Compound to manufacture a Product. Development shall include all preclinical and other nonclinical testing, test method development and stability testing, toxicology, formulation, process development, manufacturing scale-up, qualification and validation, quality assurance or quality control, Clinical Trials, manufacturing clinical supplies, regulatory affairs, statistical analysis, report writing, and all other activities necessary or reasonably useful or otherwise requested or required by a Regulatory Authority as a condition or in support of obtaining or maintaining Regulatory Approval. When used as a verb, "**Develop**" shall mean to engage in Development.

1.19 "**Distributor**" means a Third Party, other than a Third Party to which any Sublicense hereunder is granted, that (a) purchases any Products in finished form from LICENSEE or any of its Affiliates or Sublicensees with the intent or purpose of reselling such Products; and (b) has the right to Commercialize such Products in one or more regions.

1.20 "**EMA**" means the European Medicines Agency, or any successor agency thereto.

1.21 "**European Markets**" means the United Kingdom, France, Germany, Spain and Italy.

1.22 "**FDA**" means the United States Food and Drug Administration, or a successor federal agency thereto.

1.23 "**FD&C Act**" means the United States Federal Food, Drug, and Cosmetic Act, as amended, and the rules and regulations promulgated thereunder.

1.24 "**Field**" means all uses of HSCs other than Gene-Edited/-Modified HSCs.

1.25 "**First Commercial Sale**" means with respect to a Product, the first sale of such Product by LICENSEE or any of its Affiliates or Sublicensees to a Third Party for use or consumption of the Product following receipt of Regulatory Approval, for such Product in a country in the Territory.

1.26 "**FPFD**" means, with respect to a Clinical Trial, the first dosing of the first subject or patient in such Clinical Trial.

1.27 "**GAAP**" means the generally accepted accounting principles in the United States, consistently applied.

1.28 "**Gene-Edited/-Modified HSC**" means HSCs that have had their DNA or RNA altered by any means (other than naturally occurring mutations).

1.29 "**Generic Equivalent**" means, with respect to a Product in a country, any product that (a) has Regulatory Approval for use in such country pursuant to a regulatory process governing approval of generic, interchangeable or biosimilar pharmaceutical or biological product based on the then-current standards for regulatory approval in such country, where such Regulatory Approval relied on or incorporated clinical data generated by LICENSEE pursuant to this Agreement or was obtained using an abbreviated, expedited or other similar process; (b) during the Term, is not Controlled by LICENSEE (in the case of Products Commercialized by LICENSEE, its Affiliates, or their Sublicensees) under this Agreement, and (c) is sold in the same country as the relevant Product by a Third Party that is not a Sublicensee of LICENSEE (in the case of Products Commercialized by LICENSEE, its Affiliates, or their Sublicensees), and that did not purchase such product in a chain of distribution that included LICENSEE, or of any of its respective Affiliates or Sublicensees.

1.30 "**Good Manufacturing Practices**" means the then-current standards for good manufacturing practices for biological or pharmaceutical products (as applicable), as set forth in the FD&C Act and applicable regulations and guidance promulgated thereunder, including the Code of Federal Regulations, as amended from time to time, or under any other Applicable Laws.

1.31 "**Governmental Authority**" means any court, agency, department, authority or other instrumentality of any national, state, county, city or other political subdivision.

1.32 "**Hemoglobinopathy Indication**" means sickle cell disease or beta-thalassemia.

1.33 "**HSC**" means hematopoietic stem cells.

1.34 "**IND**" means: (a) an investigational new drug application filed with the FDA for authorization for the investigation of a Product; or (b) any foreign equivalents as filed with the applicable Regulatory Authorities in other countries or regulatory jurisdictions in the Territory, as applicable.

1.35 "**Indication**" for a Product means the use of such Product for treating a particular disease or medical condition.

1.36 "**Information**" means all technical, scientific and other know-how and information, trade secrets, knowledge, technology, means, methods, processes, practices, formulae, instructions, skills, techniques, procedures, experiences, ideas, technical assistance, designs, drawings, assembly procedures, computer programs, apparatuses, specifications, data, results and other material, including: biological, chemical, pharmacological, toxicological, pharmaceutical, physical and analytical, pre-clinical, clinical, safety, manufacturing and quality control data and information, including study designs and protocols, assays and biological methodology, in each case (whether or not confidential, proprietary, patented or patentable) in written, electronic or any other form now known or hereafter developed.

1.37 "**Intellectual Property Rights**" means all trade secrets, copyrights, Patents, Trademarks, moral rights, know-how and any and all other intellectual property or proprietary rights now known or hereafter recognized in any jurisdiction.

1.38 "**Invention**" means any invention, whether or not patentable, together with all intellectual property rights therein.

1.39 "**Knowledge of Novartis**" shall mean, with respect to NOVARTIS, [***].

1.40 "**Knowledge of the Novartis Deal Team**" shall mean, with respect to NOVARTIS, the actual knowledge of [***].

1.41 "**Knowledge of the Patent Associates**" shall mean, with respect to NOVARTIS, the actual knowledge of [***], in each case after review of such named individuals' relevant files and records on the Effective Date.

1.42 "**Licensed Know-How**" means Information and regulatory filings, whether or not patentable, that are owned or Controlled by NOVARTIS or its Affiliates on the Effective Date and that are included in the Covered IP, which are described generally on Exhibit B-1 (as of the Effective Date or as amended pursuant to Section 3.2).

1.43 "**Licensed Patent Rights**" means all Patents that are owned or Controlled by NOVARTIS or its Affiliates on the Effective Date, and that are included in Covered IP for use in the Territory in the Field, including those Patents listed on Schedule A.

1.44 "**Licensed Patent Rights Improvements**" means Patents owned or Controlled by either Party or its Affiliates that are created, conceived of, or reduced to practice after the Effective Date that consist of improvements to the Licensed Technology; and that are Covered IP.

1.45 "**Licensed Technology**" means collectively, the Licensed Patent Rights and Licensed Know-How.

1.46 "**Loss of Market Exclusivity**" means, with respect to any Product in any country, (a) the Net Sales of such Product in that country in any Calendar Quarter are at least [***] less, as compared with the Net Sales of such Product in that country in the Calendar Quarter immediately preceding the marketing or sale of the first Generic Equivalent of such Product; and (b) the decline in sales is reasonably attributable in material part to the availability of a Generic Equivalent in such market.

1.47 "**MAA**" means (a) a Marketing Authorization Application for a Product filed with (i) the EMA under the centralized European procedure (including amendments and supplements thereto) or (ii) a Regulatory Authority in any country in the European Union if the centralized European procedure is not used to obtain Regulatory Approval of such Product; or (b) any other equivalent or related Regulatory Filing, such as a Type II variation, to gain Regulatory Approval of a Product in any country in the European Union.

1.48 "**Major Markets**" means the United States, the United Kingdom, France, Germany, Spain, Italy and Japan.

1.49 "**Milestone**" means each milestone set forth in Section 5.2.

1.50 "**Net Sales**" means the net sales recorded by LICENSEE or any of its Affiliates or Sublicensees for any Product sold to Third Parties other than Sublicensees, as determined by computing the gross sales of such Product and deducting the following amounts, in all cases to the extent permitted by LICENSEE's Accounting Standards, as consistently applied, [***].

1.51 "**Other Active Ingredient**" means any therapeutically active pharmaceutical ingredient other than a Product.

1.52 "**Other Indication**" means an Indication that is not an Ultra Orphan Indication or an Hemoglobinopathy Indication.

1.53 "**Patents**" means: (a) all national, regional and international patents and patent applications, including provisional patent applications; (b) all patent applications filed either from such patents, patent applications or provisional applications or from an application claiming priority from either of these, including divisionals, continuations, continuations-in-part, provisionals, converted provisionals and continued prosecution applications; (c) any and all patents that have issued or in the future issue from the foregoing patent applications ((a) and (b)), including utility models, petty patents, innovation patents and design patents and certificates of invention; (d) any and all extensions or restorations by existing or future extension or restoration mechanisms, including revalidations, reissues, re-examinations and extensions (including any supplementary protection certificates and the like) of the foregoing patents or patent applications ((a), (b) and (c)); and (e) any similar rights, including so-called pipeline protection or any importation, revalidation, confirmation or introduction patent or registration patent or patent of additions to any of such foregoing patent applications and patents.

1.54 "**Person**" means an individual, corporation, partnership, limited liability company, trust, business trust, association, joint stock company, joint venture, pool, syndicate, sole proprietorship, unincorporated organization, Governmental Authority or any other form of entity not specifically listed herein.

1.55 "**Phase I Clinical Trial**" means a human clinical trial of a product, the principal purpose of which is a determination of initial tolerance or safety of such product in healthy volunteers and/or the target patient population, as described in 21 CFR 312.21(a) (as amended or any replacement thereof), or a similar clinical trial prescribed by the Regulatory Authority in a country other than the United States.

1.56 "**Phase II Clinical Trial**" means a human clinical trial of a product, the principal purpose of which is a determination of safety and efficacy in the target patient population, as described in 21 C.F.R. 312.21(b) (as amended or any replacement thereof), or a similar clinical trial prescribed by the Regulatory Authority in a country other than the United States.

1.57 "**Phase III Clinical Trial**" means a human clinical trial of a product, the design of which is acknowledged by the FDA to be sufficient for such clinical trial to satisfy the requirements of 21 C.F.R. 312.21(c) (as amended or any replacement thereof), or a similar human clinical trial prescribed by the Regulatory Authority in a country other than the United States, the design of which is acknowledged by such Regulatory Authority to be sufficient for such clinical trial to satisfy the requirements of a pivotal efficacy and safety clinical trial.

1.58 "**Phase IV Clinical Trial**" means any study of a product following the first Regulatory Approval for the sale of such product whether or not required by a Governmental Authority. Phase IV Clinical Trials may include epidemiological studies, modeling and pharmacoeconomic studies, postmarketing surveillance studies and clinical or other research studies.

1.59 "**Product**" means cord blood derived non-Gene-Edited/-Modified HSCs, expanded in the presence of the Compounds, or created through the use of Licensed Know-How, in any and all dosage forms, presentations and formulations.

1.60 "**Progress Milestone**" means [***].

1.61 "**Regulatory Approval**" means, with respect to a Product in any country or regulatory jurisdiction, any approval (including where required or otherwise reasonably necessary to determine commercial viability, pricing and reimbursement approvals), registration, license or authorization that is required by the applicable Regulatory Authority to market and sell such Product in such country or regulatory jurisdiction.

1.62 "**Regulatory Authority**" means any Governmental Authority responsible for granting Regulatory Approvals for a Product in the Territory.

1.63 "**Regulatory Filings**" means, with respect to a Product, any submission to a Regulatory Authority of any appropriate regulatory application, including, without limitation, any IND, any BLA, any submission to a regulatory advisory board, any marketing authorization application (including any MAA), and any supplement or amendment thereto.

1.64 "**Royalty Term**" means, on a Product-by-Product and country-by country basis, the period commencing on the First Commercial Sale of such Product in such country and expiring upon the later of: (a) expiration of the last Valid Claim of a Licensed Patent Right that covers the manufacture, use, or sale of such Product or a Compound used in the manufacture of such Product in such country; or (b) [***] following the date of First Commercial Sale of such Product in such country.

1.65 "**Sublicense**" means a bona fide, arms length agreement (other than a permitted assignment of this Agreement) in which a Party (a) grants or otherwise transfers any of the rights licensed to such Party hereunder, (b) agrees not to assert such rights or to sue, prevent or seek a legal remedy for the performance or practice of same, or (c) is under an obligation to grant, assign or otherwise transfer any such rights or non-assertion, or to forebear from granting or otherwise transferring such rights to any other entity. Agreements expressly considered Sublicenses include (x) licenses, option agreements, "lock up" agreements, right of first refusal agreements, non-assertion agreements, covenants not to sue, distribution agreements that grant or otherwise transfer any rights licensed to a Party hereunder, or similar agreements and (y) agreements that grant or otherwise transfer rights licensed to a Party under this Agreement along with rights owned by such Party or granted to such party by a Third Party. For the avoidance of doubt, if a Sublicense is entered into pursuant to an option or similar agreement that is also a Sublicense, then the date of the exercise of the option or similar agreement shall be deemed the execution date, not the date of the execution of the Sublicense.

1.66 "**Sublicense Income**" shall mean consideration in any form that LICENSEE or any of its Affiliates receives in consideration of a Sublicense of any Product under such Sublicense. Sublicense Income shall include any license fee, license maintenance fee, option fee, milestones (other than sales milestones relating to Net Sales of greater than [***]) and fair market value of equity securities received by LICENSEE or an Affiliate in consideration of such Sublicense that is not issued in exchange for any cash payment; ***provided that*** in the event a milestone payment is due to LICENSEE under a Sublicense, on the one hand, and to NOVARTIS under this Agreement, on the other hand, for the same or reasonably similar milestone event, the amount of Sublicense Income that LICENSEE receives shall be deemed to be the difference between the milestone payment payable under the Sublicense minus the Milestone Payment due under this Agreement to NOVARTIS. In the event LICENSEE or an Affiliate receives non-monetary consideration in connection with a Sublicense, Sublicense Income shall be calculated based on the fair market value of such consideration at the time of the transaction assuming an arm's length transaction made in the ordinary course of business.

Sublicense Income specifically excludes the following:

[***]

1.67 "**Sublicensee**" shall mean any entity to which LICENSEE or its Affiliate has granted a Sublicense.

1.68 "**Territory**" means worldwide.

1.69 "**Third Party**" means any Person other than a Party or an Affiliate of a Party.

1.70 "**TSRI**" means The Scripps Research Institute.

1.71 "**TSRI Agreement**" means the license agreement by and between TSRI and Novartis Pharmaceuticals Corporation, dated May 30, 2008, pursuant to which certain of the Licensed Patent Rights and Licensed Know-How were licensed to Novartis' Affiliate.

1.72 "**TSRI IP**" means the portion of the Licensed Patent Rights and Licensed Know-How that were licensed to Novartis' Affiliate pursuant to the TSRI Agreement.

1.73 "**Trademarks**" means all registered and unregistered trademarks, service marks, trade dress, trade names, logos, insignias, domain names, symbols, designs, and combinations thereof.

1.74 "**Ultra Orphan Indication**" means (i) the diseases or medical conditions included in the three families of diseases or medical conditions set forth on Schedule 1.74, to the extent the various diseases or medical conditions are expressly identified on that schedule; and (ii) any other Indication for a disease or medical condition with a prevalence of ten (10) cases or less per one hundred thousand (100,000) persons as published by either one (or both) of Orphanet or the National Institutes of Health National Library of Medicine. For purposes of this Section 1.74, any group of Indications for which a single Regulatory Approval may be obtained shall be considered a single Indication, and if each Indication in such group of Indications meets the criteria described in clause (ii) above, such group of Indications shall together be considered a single Ultra Orphan Indication, unless the total prevalence of all diseases in the group exceeds 30 in 100,000. If the patient numbers in a relevant publication are given in a range, then for the purpose of determining the prevalence of the disease, the geometric mean of such range will be used *(i.e.*, the following formula will be used: $P = \sqrt{(L * H)}$, where *P* is the total prevelance for the purpose of this definition, *L* is the low end (minimum) of the relevant prevelance range, and *H* is the high end (maximum) of the relevant prevelance range).

1.75 "**Use**" means to research, develop, make, have made, use, sell, offer for sale, market, distribute, import, export or otherwise exploit.

1.76 "**Valid Claim**" means either: (a) a claim of an issued and unexpired Patent included within the Licensed Patent Rights, which has not been permanently revoked or declared unenforceable or invalid by an unreversed and unappealable or unreversed and unappealed decision of a court or other appropriate body of competent jurisdiction and which has not been abandoned, disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination, disclaimer or otherwise; or (b) a claim of a pending patent application included within the Licensed Patent Rights that has been pending for less than seven (7) years from the earliest claimed priority date, which claim was filed in good faith and has not been cancelled, withdrawn, abandoned or finally disallowed without the possibility of appeal or refiling of such application.

1.77 **Additional Definitions**. Each of the following definitions is set forth in the Section indicated below:

Definition	Section
AAA	16.2
Agreement	Preamble
Allocation Arbitrator	5.2.6(c)
Allocation Dispute	5.2.6(b)
Allocation Notice	5.2.6(b)
Allocation Notice Period	5.2.6(b)
Arbitrator	16.2
Bankruptcy Code	13.4

Bankruptcy Event	13.4
CDA	17.11
Certificate of Analysis	4.4.1(b)
Claims	11.1
Defense Action	8.1
Designated Affiliate/Third Party	13.6.4(e)
Developed IP	7.2
Effective Date	Preamble
Existing Supply	4.4.1(a)
Fees	6.1.1
Force Majeure Event	17.4
HemOnc IND	4.3.1(a)
IMD IND	4.3.1(b)
Indemnification Claim Notice	11.3.1
Indemnified Party	11.3.1
Indemnifying Party	11.3.1
LICENSEE	Preamble
LICENSEE Indemnitees	11.2
LICENSEE Inventory	13.6.4(e)
Losses	11.1
Milestone	5.2.1
Milestone Payment	5.2.1
Multi-Product Sublicense	5.2.6(b)
Notice Period	13.2.1
NOVARTIS	Preamble
NOVARTIS Indemnitees	11.1
Part(ies)	Preamble
Pharmacovigilance Agreement	4.3.3
Proposed Allocation	5.2.6(b)
Proposed Dispute Allocation	5.2.6(c)
Public Company	5.1.2
Recipients	9.2
Relevant Records	6.1.1
Remaining Recoveries	8.2.4
Reversion IP	13.6.4(a)
Royalty Payment	5.2.5(a)(vi)
Series A Preferred Stock	5.1.1
Series B Financing	5.1.2
Series B Preferred Stock	5.1.2
Specifications	4.4.1(b)
Subsequent Shares	5.1.2
Term	13.1
Third Party Infringement	8.1
Third Party IP	5.2.5(b)
Third Party Payment	5.2.5(b)
Transfer Activities	3.1
Upfront Shares	5.1.1
VAT	5.4.1

2. LICENSES AND IMPROVEMENTS.

2.1 License Grant.

2.1.1 **Licensed Technology**. NOVARTIS hereby grants to LICENSEE a sublicensable (subject to Section 2.2), royalty-bearing right and license under the Licensed Technology and under all Information contained in the HemOnc IND (a) to research, Develop, and manufacture Compounds for the purpose of Using such Compounds to manufacture and Commercialize Products in the Field in the Territory, and (b) to research, Develop, manufacture, and Commercialize Products in the Field in the Territory, including, for the avoidance of doubt, in the case of Information contained in the HemOnc IND, to include such Information in Regulatory Filings filed by LICENSEE, its Affiliates or Sublicensees in connection with the research, Development or manufacture of Compounds or Products in the Field in the Territory. The license granted under this Section 2.1.1 shall be exclusive even as to NOVARTIS and its Affiliates with respect to Products in the Field; *provided*, *however*, that (a) TSRI retains the right to practice and Use the TRSI IP for its own research and educational purposes, and retains the right to grant licenses to the TSRI IP to other non-profit organizations, government agencies, and universities for their research and educational purposes; (b) NOVARTIS and its Affiliates will retain the right to practice and Use the Licensed Technology in the Field for internal research (but not Development or Commercialization) purposes; and (c) LICENSEE acknowledges that portions of the TSRI IP may be considered "Subject Inventions" under 35 U.S.C. § 200-212, and as a result, the United States Government retains certain rights to the TSRI IP under Applicable Law. For the avoidance of doubt, Novartis and its Affiliates will retain the right to Use and practice the Licensed Technology other than for the purpose of manufacturing, Developing, and Commercializing Products in the Field.

2.1.2 **Affiliates**. To the extent that any of the Licensed Technology is Controlled by an Affiliate of NOVARTIS (including but not limited to, *e.g.*, the TSRI IP), then promptly following the Effective Date, NOVARTIS shall procure that such Affiliate undertakes all necessary actions to give effect to the licenses granted under this Section 2.1.

2.2 Cross License to Licensed Patent Rights Improvements.

2.2.1 Upon LICENSEE's written request, which must identify with specificity the relevant Patent Right, NOVARTIS hereby grants to LICENSEE a fully paid and royalty-free, non-exclusive license to practice any Licensed Patent Rights Improvements Controlled by NOVARTIS (a) to research,

Develop, and manufacture Compounds for the purpose of Using such Compounds to manufacture and Commercialize Products in the Field in the Territory, and (b) to research, Develop, manufacture, and Commercialize Products in the Field in the Territory.

2.2.2 Upon NOVARTIS's written request, which must identify with specificity the relevant Patent Right, LICENSEE hereby grants to NOVARTIS and its Affiliates a fully paid and royalty-free, non-exclusive license to practice any Licensed Patent Rights Improvements Controlled by LICENSEE (a) to research, Develop, and manufacture Compounds for the purpose of Using such Compounds to manufacture and Commercialize HSC products outside the Field in the Territory, and (b) to research, Develop, manufacture, and Commercialize HSC products made Using such Compounds outside the Field in the Territory.

2.2.3 For clarity, nothing in this Section 2.2 grants to either Party any license to Know-How arising after the Effective Date, and neither Party will have any obligation to inform the other Party of the existence of any Licensed Patent Rights Improvements or to conduct any technology transfer or to provide any assistance with respect to any Licensed Patent Rights Improvements.

2.3 **Sublicense Rights**. Each Party shall have the right to Sublicense the rights granted to it by the other Party under this Agreement (including rights under Section 2.1 and Section 2.2), through multiple tiers of Sublicensees to its Affiliates or any Third Party, ***provided that*** (a) any such Sublicenses shall be consistent with the terms and conditions of this Agreement, (b) each Party shall be responsible for the acts and omissions of its Sublicensees as if such Sublicensees were the relevant Party hereunder, and (c) if a Party licenses or Sublicenses (as applicable) all or substantially all of its rights under this Agreement or, in the case of NOVARTIS, its retained rights in the Licensed Technology (e.g., if LICENSEE Subicenses all of its rights to Develop and Commercialize all HSCs in the Field or NOVARTIS licenses all of its remaining rights in the Licensed Technology), then, as a condition to such Sublicense or license, the Sublicensee or licensee must agree to be bound by the provisions of Section 2.2.1 or Section 2.2.2 (as applicable) as if such licensee or Sublicensee were NOVARTIS or LICENSEE (as applicable). A Party granting a Sublicense pursuant to this Section 2.3 shall furnish to the other Party a true and complete copy of each Sublicense and each amendment thereto, within thirty (30) days after the Sublicense or amendment has been executed, which copy may be redacted by the Party granting the Sublicense to remove proprietary and confidential information to the extent not required to confirm compliance with this Section 2.3; ***provided that*** neither Party shall be required to provide copies of any Sublicenses with Third Parties that are solely performing services on behalf of such Party (which, for the avoidance of doubt, shall not include Sublicenses with academic investigators and collaborators). The terms of any Sublicense disclosed to the other Party pursuant to this Section 2.3 shall be deemed the Confidential Information of the relevant Party granting the Sublicense.

3. TRANSFER ACTIVITIES

3.1 **Technology Transfer and Transition Services**. NOVARTIS shall (a) transfer to LICENSEE the embodiments of the Licensed Technology set forth in Schedule B-2; and (b) perform the services set forth in Schedule B-2 (where the activities under subsections (a) and (b) shall be collectively referred to as "**Transfer Activities**"). NOVARTIS shall use commercially reasonable efforts to perform the Transfer Activities and complete such Transfer Activities within the time periods specified in Schedule B-2.

3.2 **Subsequently Identified Licensed Technology**. To the extent that LICENSEE identifies in writing to Novartis, within six (6) months after the Effective Date, Licensed Know-How that was not identified in Schedule B-1 as of the Effective Date, the Parties will update Schedule B-1 to add such Licensed Know-How, to the extent such proposed Licensed Know-How **(a)** was owned or Controlled by NOVARTIS or its Affiliates as of the Effective Date; and **(b)** relates specifically to the Licensed Patent Rights or Licensed Know-How as of the Effective Date. Notwithstanding the foregoing, in no event will Schedule B-1 be amended to add (and Novartis will not be required to conduct Transfer Activities with respect to) (i) HSC formulations other than commercially available liquid or cryopreserved formulations; (ii) manufacturing methods other than "Process B Cryopreserved"; (iii) conditioning regimens; (iv) transfusion protocols; (v) methods of manufacturing Products (other than those that have been previously transferred to or developed at the Molecular and Cellular Therapies group at the University of Minnesota); or (vi) except where expressly provided in Schedule B-1, any reports other than "finalized" or "final" reports.

4. DEVELOPMENT, MANUFACTURING, REGULATORY AND COMMERCIALIZATION

4.1 **Development**.

4.1.1 LICENSEE shall itself, or through its Affiliates or Sublicensees, use Commercially Reasonable Efforts to Develop Products in the Major Markets in the Field, and LICENSEE shall undertake all Development activities relating to the Compounds and Products in the Field at its sole expense. Without limiting the foregoing, in connection with its efforts to Develop Products, LICENSEE shall bear all responsibility and expense for filing Regulatory Filings in LICENSEE's name and obtaining Regulatory Approval for Products. Until LICENSEE obtains Regulatory Approval for a Product in a country in the Territory, LICENSEE shall provide to NOVARTIS reports summarizing LICENSEE's Development results annually during the term of this Agreement (including progress and development) and LICENSEE will make appropriate personnel available

telephonically once per year to discuss such reports with NOVARTIS. LICENSEE shall provide each such report to NOVARTIS no later than December 31st of each year until such reports are no longer required pursuant to this Section 4.1.1. Novartis will not consent for TSRI to conduct any Clinical Trials in the Field pursuant to Section 4.3 of the TSRI Agreement.

4.2 **Commercialization**. LICENSEE shall itself, or through its Affiliates, Sublicensees or Distributors, use Commercially Reasonable Efforts to Commercialize the Products in those Major Market countries where it has received Regulatory Approval, it being understood that LICENSEE, in the exercise of such Commercially Reasonable Efforts, may determine to not Commercialize the Product in certain Major Market countries. LICENSEE shall undertake such activities at its sole expense and shall have sole decision-making authority with respect to such activities.

4.3 **Regulatory and Pharmacovigilance**.

4.3.1 **Right of Reference of Regulatory Filings; Assignment of IND**.

(a) NOVARTIS hereby grants to LICENSEE and any Affiliate, Sublicensee or other designee of LICENSEE the right to reference the HemOnc IND (#14822) (the "**HemOnc IND**") for the purpose of Developing, and seeking, obtaining, and maintaining Regulatory Approval for, manufacturing and otherwise exploiting Products in the Field in the Territory. Novartis will maintain the HemOnc IND as "open" until March 1, 2019. NOVARTIS will provide a copy of the HemOnc IND in accordance with the provisions set forth on Schedule B-2. NOVARTIS shall, promptly following any request by LICENSEE, provide notifications reasonably requested by LICENSEE to Regulatory Authorities identified by LICENSEE. If, after March 1, 2019, NOVARTIS intends to close the HemOnc IND, it will give ninety (90) days' written notice of such intention to LICENSEE, and if LICENSEE requests that the HemOnc IND be transferred to it during that time period, NOVARTIS shall assign to LICENSEE the HemOnc IND and all associated Regulatory Filings in a manner consistent with the provisions set forth for the assignment of the IMD IND (described in Schedule B-2).

(b) NOVARTIS shall assign to LICENSEE the Inherited Metabolic Disease IND (#16729) (the "**IMD IND**") and all associated United States Regulatory Filings. NOVARTIS will transfer such Regulatory Filings, documents, records, and data regarding the IMD IND in accordance with the provisions set forth on Schedule B-2.

(c) LICENSEE shall use commercially reasonable efforts to seek Regulatory Approval for Products in the Major Markets, it being understood that LICENSEE, in the exercise of such Commercially Reasonable Efforts, may determine to not seek Regulatory Approval for Product in certain Major Market countries.

4.3.2 **Safety Report**. NOVARTIS shall submit NOVARTIS-generated safety reports for all Compounds to the relevant Regulatory Authorities until the effective date of the transfer of the IMD IND to LICENSEE.

4.3.3 **Pharmacovigilance and Regulatory Reporting Agreement**. The Parties shall cooperate with regard to the reporting and handling of safety information involving or relating to the Compounds and/or the Products to the extent required by Applicable Laws. Following the Effective Date, in time to ensure that all regulatory requirements are met, and to the extent required by Applicable Laws or any Regulatory Authority, the Parties will enter into a written agreement that will govern the exchange of adverse event and other safety information and the Parties', their Affiliates' and their Sublicensees' respective reporting obligations relating to the Compounds and/or the Products (the "**Pharmacovigilance Agreement**"). Such Pharmacovigilance Agreement shall ensure that adverse events and other safety information is exchanged and reported to the relevant Regulatory Authorities upon terms that will permit each Party to comply with Applicable Laws and requirements of Regulatory Authorities.

4.3.4 **Regulatory Cooperation**. If a Regulatory Authority contacts NOVARTIS regarding an audit of any of the research and development done prior to the Effective Date, by, or under the direction of, NOVARTIS regarding HSC835, NOVARTIS shall, without undue delay, notify LICENSEE and shall respond to the query or allow the Regulatory Authority to audit the relevant data as may be requested; ***provided that*** NOVARTIS will provide LICENSEE with a reasonable amount of time to provide comments regarding any such response and shall consider in good faith all such comments. If a Regulatory Authority contacts LICENSEE regarding an audit of any of the research and development done prior to the Effective Date, by, or under the direction of, NOVARTIS regarding HSC835, NOVARTIS shall use reasonable efforts to provide reasonable assistance to LICENSEE to respond to the query or allow the Regulatory Authority to audit the relevant data as may be requested. As long as Novartis retains all source documents in the HemOnc IND, NOVARTIS will provide reasonable assistance to assist LICENSEE to prepare responses to any Regulatory Agency questions related to NOVARTIS-generated data. Such services will be billed to LICENSEE at the rate of [***].

4.4 **Manufacturing**. LICENSEE shall have the sole right to manufacture, or have manufactured, Products in the Field, and it shall be entitled to use, and to Sublicense the manufacturing rights under the Licensed Patent Rights, for such purposes. Except as provided below, LICENSEE shall be responsible for all aspects of manufacturing of the Compounds and Products. LICENSEE acknowledges that a portion of the TSRI IP may be considered "Subject Inventions" under 35 U.S.C. § 200-212, and as a result, Applicable Law may require LICENSEE to manufacture Products covered by the TRSI IP in the United States, unless a waiver of such obligation is obtained by LICENSEE.

4.4.1 **Transfer of Inventory**.

(a) At LICENSEE's request, which request must be made no later than 60 days after the Effective Date and for a period of not to exceed 30 days from the first date of any such request, NOVARTIS will make available to LICENSEE nine hundred (900) vials of LDH221 (2.2mg/ml liquid, in vial 1ml (DS batch 101003005, DP batch Y0920614)), to the extent in Novartis's or its Affiliates possession and in the form in Novartis' or its Affiliates' possession as of the date of LICENSEE's request (the "**Existing Supply**"). The Existing Supply will be made available Ex Works (NOVARTIS' facility in Basel, Switzerland) (Incoterms 2010) for no more than two shipments, and LICENSEE shall assume all responsibility for shipping, insuring, and receiving the Existing Supply from that facility. The Existing Supply will not be used for the Commercialization of a Product. LICENSEE (a) will use such Existing Supply solely for performance of the research and Development of Products, under suitable containment conditions in accordance with all Applicable Laws, as well as with all guidelines for use of the Existing Supply provided by NOVARTIS; (b) will under no circumstances administer the Existing Supply to humans (except as may be incidentally included in a Product); and (c) will use the Existing Supply with caution and prudence in any experimental work, since not all of the characteristics of such Existing Supply are necessarily known. Subject to NOVARTIS' compliance with Section 4.4.1(b), LICENSEE shall bear all risk to it and/or any others resulting, directly or indirectly, from shipping, receipt, use, application, storage, disposal, and destruction of the Existing Supply.

(b) At the time of transfer of any Existing Supply to LICENSEE, each shipment of Existing Supply (i) will have been manufactured in accordance with all Applicable Laws in effect at the time of manufacture, (ii) will have been manufactured under Good Manufacturing Practices; (iii) shall conform to specifications to be provided to LICENSEE upon shipment (the "**Specifications**"). For the avoidance of doubt, the Specifications shall only define the Existing Supply in the form specified above, and no warranty is provided that the Specifications will be fit for LICENSEE's

purposes and no warranty is given with respect to any other forms, strengths, or formulations. NOVARTIS shall provide to LICENSEE a certificate of analysis (a "**Certificate of Analysis**") with each shipment of Existing Supply stating that such Existing Supply conforms to such Specifications. Such Certificate of Analysis shall include (i) the manufacturing date and the expiration date for the Existing Supply and (ii) a statement confirming that such Existing Supply was manufactured in accordance with Good Manufacturing Practices.

5. PAYMENT TERMS

5.1 Equity.

5.1.1 In partial consideration of the licenses and rights granted to LICENSEE hereunder, LICENSEE shall issue to NOVARTIS on the Effective Date a number of shares of LICENSEE's Series A Preferred Stock (the "**Series A Preferred Stock**") equal to $2,500,000 divided by the original issue price per share of the Series A Preferred Stock (the "**Upfront Shares**"). In connection with the issuance of the Upfront Shares, NOVARTIS shall become a party to all other agreements to which other holders of the Series A Preferred Stock have become parties in connection with their purchase of Series A Preferred Stock together with such other customary documents as LICENSEE may reasonably request, [***].

5.1.2 In partial consideration of the licenses and rights granted to LICENSEE hereunder, LICENSEE shall, upon the earlier of (i) the closing of a transaction by LICENSEE (the "**Series B Financing**") whereby LICENSEE issues a new series of Preferred Stock of Licensee (the "**Series B Preferred Stock**") or (ii) December 31, 2017, issue additional shares of its capital stock accordance with this Section 5.1.2. In the event of a Series B Financing, LICENSEE shall issue to NOVARTIS a number of shares of Series B Preferred Stock equal to $2,500,000 divided by the original issue price of the Series B Preferred Stock no later than thirty (30) days after the closing of the Series B Financing. In the event that a Series B Financing has not occurred prior to December 31, 2017, LICENSEE shall issue to NOVARTIS, no later than January 15, 2018, the number of shares of Series A Preferred Stock equal to the number of Upfront Shares issued pursuant to Section 5.1.1 (in either case, such shares are referred to as "**Subsequent Shares**"); *provided*, *however*, [***]. Notwithstanding the foregoing, if LICENSEE has consummated an initial public offering of its common stock or otherwise has a class of capital stock registered under the Securities Exchange Act of 1934, as amended (the foregoing hereinafter referred to as being a "**Public Company**") prior to December 31, 2017, or if LICENSEE has undergone a Change of Control prior to December 31, 2017, then, in lieu of the issuance of the Subsequent Shares, LICENSEE shall pay to NOVARTIS, not later than thirty (30) days after becoming a Public Company or completing a Change of Control (as applicable) $2,500,000.

5.2 Milestones and Royalty Payments.

5.2.1 Milestone Payments. LICENSEE shall notify NOVARTIS within [***] days after achievement of each Milestone described in Sections 5.2.2, 5.2.3 and 5.2.4 (each, a "**Milestone**"). In further consideration of the licenses and rights granted to LICENSEE, within [***] days after achievement of each Milestone set forth below (unless otherwise specified below), LICENSEE shall, subject to Section 1.6, pay to NOVARTIS the corresponding non-creditable and non-refundable milestone payment (each, a "**Milestone Payment**"). For the avoidance of doubt each Milestone Payment shall be payable only once upon achievement of the applicable Milestone.

5.2.2 Development Milestones.

DEVELOPMENT MILESTONE	MILESTONE PAYMENT
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

(a) Notwithstanding the foregoing, on a Milestone by Milestone basis, instead of paying the Milestone Payment for any Development Milestone set forth in this Section 5.2.2 in cash, LICENSEE may elect, at its sole discretion, to issue to NOVARTIS shares of the series of preferred stock then most recently issued by LICENSEE, if such Milestone is achieved and payment is due prior to LICENSEE becoming a Public Company and prior to a Change of Control. The number of shares to be issued pursuant to this clause shall be equal to the amount of the Milestone owed to NOVARTIS divided by the issuance price of the then-most recent series of preferred stock of LICENSEE. In connection with such issuance, NOVARTIS shall enter into any agreement and execute any customary document that LICENSEE may reasonably request *provided, however*, [***].

5.2.3 Regulatory Milestones.

REGULATORY MILESTONES	MILESTONE PAYMENT
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

5.2.4 Sales Milestones.

SALES MILESTONES	MILESTONE PAYMENT
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

(a) [***]. The development Milestones provided for in this Section 5.2.4 shall be due and payable within [***] days after the end of the Calendar Quarter in which the relevant Sales Milestone has been met.

5.2.5 Royalty Payments.

(a) In consideration of the licenses and rights granted to LICENSEE hereunder, LICENSEE shall pay to NOVARTIS, with respect to sales of the Products in the Territory during the applicable Royalty Term, an amount equal to:

(i) [***] of Net Sales in a Calendar Year (or portion thereof) for the portion of annual aggregate Net Sales of the Products in the Territory (aggregated in all countries with respect to which the Royalty Term for such Products has not expired) below or equal to [***]; plus

(ii) [***] of Net Sales in a Calendar Year (or portion thereof) for the portion of annual aggregate Net Sales of the Products in the Territory (aggregated in all countries with respect to which the Royalty Term for such Products has not expired) greater than [***] and less than or equal to [***]; plus

(iii) [***] of Net Sales in a Calendar Year (or portion thereof) for the portion of annual aggregate Net Sales of the Products in the Territory (aggregated in all countries with respect to which the Royalty Term for such Products has not expired) greater than [***] and less than or equal to [***]; plus

(iv) [***] of Net Sales in a Calendar Year (or portion thereof) for the portion of annual aggregate Net Sales of the Products in the Territory (aggregated in all countries with respect to which the Royalty Term for such Products has not expired) greater than [***] and less than or equal to [***]); plus

(v) [***] of Net Sales in a Calendar Year (or portion thereof) for the portion of annual aggregate Net Sales of the Products in the Territory (aggregated in all countries with respect to which the Royalty Term for such Products has not expired) greater than [***] and less than or equal to [***]; plus

(vi) [***] of Net Sales in a Calendar Year (or portion thereof) for the portion of annual aggregate Net Sales of the Products in the Territory (aggregated in all countries with respect to which the Royalty Term for such Products has not expired) in excess of [***] (each, a "**Royalty Payment**").

LICENSEE shall pay such Royalty Payments to NOVARTIS within [***] days following the end of each Calendar Quarter after the date of the First Commercial Sale.

(b) If, during the Term, LICENSEE determines in good faith that it is reasonably necessary to obtain any Third Party's Intellectual Property Rights ("**Third Party IP**") in order to Develop, Commercialize or manufacture a Compound or Product, then in the event LICENSEE or any of its Affiliates or Sublicensees obtains a license under or acquires such Third Party IP, and if LICENSEE or any of its Affiliates or Sublicensees pays any amounts to such Third Party in connection with a license under or the acquisition of such Third Party IP, including upfront payments, milestones or royalties (the "**Third Party Payment**"), then LICENSEE may credit [***] of such Third Party Payment made in a given Calendar Quarter against the Royalty Payments owed and payable on the Net Sales for the Product for such Calendar Quarter. Notwithstanding the foregoing, in no event shall such credits reduce the royalties payable to NOVARTIS to less than [***] of the Royalty Payments that would otherwise be owed on such Net Sales prior to the application of such credits; provided that any permitted credits under this Section 5.2.5(b) that are not fully used by LICENSEE against any royalties payable under Section 5.2.5 in

a particular Calendar Year to reduce the Royalty Payments in such Calendar Year may be carried over to Royalty Payments in subsequent Calendar Years, until fully used in accordance with this Section 5.2.5(b). Notwithstanding the foregoing, if the TSRI Agreement is terminated, and if LICENSEE obtains a direct license to the TSRI Technology (as defined in the TSRI Agreement) following such termination, LICENSEE may deduct any payment paid to TSRI under such agreement from any payment due to Novartis under this Agreement.

(c) If a Loss of Market Exclusivity for any Product occurs in any country in the Territory, and for so long as the Loss of Market Exclusivity continues, the Net Sales of such Product for such country, for the purpose of the calculation of Royalty Payments due under Section 5.2.5 will be reduced by [***].

(d) During the Royalty Term, the operation of Sections 5.2.5(b) and 5.2.5(c) individually or in combination, shall not reduce by more than [***] the Royalty Payments that would otherwise have been owed under Section 5.2.5 for a Product in the Territory in any Calendar Quarter.

(e) Commencing on the First Commercial Sale of a Product, LICENSEE will provide reports on a Calendar Quarter basis (with each such report to be delivered within [***] days after the end of such Calendar Quarter), which will include a total quarterly sales calculation of gross sales of Products, Net Sales of Products (detailing all deductions), any deductions pursuant to Sections 5.2.5(b) and 5.2.5(c), and all Royalty Payments payable to NOVARTIS for the applicable Calendar Quarter (including any foreign exchange rates used), in all cases denominated in US Dollars (for sales within the US) and the relevant local currency converted into US Dollars based on the then applicable European Central Bank conversion rate for such currency (for ex-US sales).

5.2.6 Sharing of Sublicense Income.

(a) LICENSEE will pay to NOVARTIS a percentage of Sublicense Income received in any Calendar Quarter during the Term as set forth below.

(i) [***] of Sublicense Income if the Sublicense is executed prior to the achievement of the Progress Milestone; or

(ii) [***] of Sublicense Income if the Sublicense is executed after the Progress Milestone is met.

(b) Notwithstanding the foregoing, if any Sublicense includes a grant of rights to exploit products other than Products (in addition to a grant of rights to exploit Products) (a "**Multi-Product Sublicense**"), then, LICENSEE shall be entitled to allocate in good faith the consideration received for such Multi-Product Sublicense to the Sublicense of rights related to Products and the license of rights related to other products based on the relative value of such Sublicense rights to such other rights and, within [***] days after the execution of such Multi-Product Sublicense, LICENSEE will provide written notice to NOVARTIS (the "**Allocation Notice**") of such proposed allocation of consideration, which will included an analysis of its methodology and data used in connection with the Proposed Allocation (the "**Proposed Allocation**"). LICENSEE and NOVARTIS will discuss such Proposed Allocation in good faith. NOVARTIS may, within [***] days after delivery of such notice, or such longer period as Novartis may reasonably request (the "**Allocation Notice Period**"), object to such Proposed Allocation (an "**Allocation Dispute**"). In the event of any such Allocation Dispute, the Parties will resolve such dispute pursuant to Section 5.2.6(c); ***provided that***, any payment obligation of any Sublicense Income due under Section 5.2.6 under such Multi-Product Sublicense shall be tolled until the resolution of such dispute pursuant to Section 5.2.6(c); ***provided further that***, upon the resolution of such dispute, LICENSEE shall pay NOVARTIS for any Sublicense Income due to NOVARTIS under such Multi-Product Sublicense by the later of: (i) [***] days after the resolution of such dispute; or (ii) the date which such payment is due under this Agreement pursuant to Section 5.2.6(d). For the avoidance of doubt, if NOVARTIS does not object to the Proposed Allocation within the Allocation Notice Period, then LICSENSEE's Proposed Allocation shall be deemed to be the allocation under this Agreement with respect to Sublicense Income received under such Multi-Product Sublicense. For the avoidance of doubt, the portion of any consideration under a Multi-Product Sublicense that is allocated to non-Products pursuant to this Section 5.2.6(b) shall not be considered Sublicense Income.

(c) In the event of an Allocation Dispute, the Parties will work in good faith to resolve the disagreement. If the Parties are unable to reach a mutually acceptable resolution of any such dispute within [***] Business Days, such dispute will be resolved by submitting such dispute to a single neutral and independent arbitrator who is knowledgeable about the industry and the subject matter at issue in the dispute (the "**Allocation Arbitrator**"). The Parties shall mutually agree on the Allocation Arbitrator. Within [***] Business Days after the selection of the Allocation Arbitrator, each Party shall submit its proposed allocation of the

consideration received for such Multi-Product Sublicense to the Sublicense of rights related to Products and the license of rights related to other products based on the relative value of such Sublicense rights to such other rights, along with any documentation, data or materials supporting such allocation that such Party desires to submit; ***provided that,*** LICENSEE may only submit such documentation, data or materials to the Allocation Arbitrator to the extent that LICENSEE previously provided such materials to NOVARTIS pursuant to Section 5.2.6(b) (each, a "**Proposed Dispute Allocation**"**),** to the Allocation Arbitrator. The Allocation Arbitrator shall render its decision within [***] Business Days after receipt of the Proposed Dispute Allocations from the Parties. The Allocation Arbitrator shall choose the Proposed Dispute Allocation submitted by either LICENSEE or NOVARTIS and may not modify such chosen Proposed Dispute Allocation in any way. The decision of the Allocation Arbitrator shall be final and binding upon the Parties, and the fees and expenses of the Allocation Arbitrator shall be borne by the Party whose Proposed Dispute Allocation is not chosen by the Allocation Arbitrator.

(d) LICENSEE shall pay amounts due to NOVARTIS under this Section 5.2.6 within [***] days of the end of each Calendar Quarter, and at such time will deliver to NOVARTIS a report setting forth for such Calendar Quarter all Sublicense Income received by LICENSEE and the portion of any Sublicense Income due to NOVARTIS under this Section 5.2.6.

5.3 Payment Method.

5.3.1 **Currency**. With respect to Net Sales invoiced in U.S. dollars, the Net Sales and the amounts due for Royalty Payments under Section 5.2.5 will be expressed in U.S. dollars. With respect to Net Sales invoiced in a currency other than U.S. dollars, such conversion shall be made using the conversion methodology described in Section 5.2.5(e).

5.3.2 **Method of Payment**. All payments to a Party shall be made by wire transfer in U.S. Dollars to the credit of such bank account as may be designated by such Party to the other Party in writing. Any payment which falls due on a date which is not a Business Day may be made on the next succeeding Business Day.

5.4 Taxes.

5.4.1 **VAT**. Notwithstanding anything to the contrary in this Agreement, this Section 5.4.1 shall apply with respect to value added tax or any similar tax ("**VAT**"). All payments are exclusive of VAT. If any VAT is required in

respect of any payments made under this Agreement under Applicable Law, LICENSEE shall pay VAT at the applicable rate in respect of any such payments following the receipt of a valid VAT invoice in the appropriate form issued by NOVARTIS in respect of those payments. NOVARTIS shall issue invoices for all amounts payable under this Agreement consistent with the applicable requirements for VAT. Any VAT included in an invoice will be payable by LICENSEE to NOVARTIS within [***] days after the receipt by LICENSEE of the applicable valid invoice relating to that VAT payment. LICENSEE shall not be responsible for any penalties or interest resulting from the failure by NOVARTIS to collect (if not included on a valid VAT invoice) or remit any such VAT. NOVARTIS and LICENSEE shall reasonably cooperate to eliminate or minimize the amount of any such VAT imposed on the transactions contemplated in this Agreement. If the VAT originally paid or otherwise borne by the LICENSEE is in whole or in part subsequently determined not to have been chargeable, all necessary steps will be taken by NOVARTIS to receive a refund of such undue VAT from the applicable taxing authority or other fiscal authority and any amount of VAT repaid by such taxing authority or other fiscal authority will be transferred to LICENSEE within [***] days of receipt.

5.4.2 **Tax Cooperation**. To the extent LICENSEE is required to deduct and withhold taxes on any payments to NOVARTIS, LICENSEE shall pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to NOVARTIS an official tax certificate or other evidence of such withholding sufficient to enable NOVARTIS to claim such payments of taxes. NOVARTIS shall provide to LICENSEE any tax forms that may be reasonably necessary in order for LICENSEE not to withhold tax or to withhold tax at a reduced rate under an applicable bilateral income tax treaty. Each party shall provide the other with reasonable assistance to enable the recovery, as permitted by law, of withholding taxes, VAT, or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of the party bearing such withholding tax or VAT.

5.4.3 **Tax Forms**. The parties agree to cooperate and produce on a timely basis any tax forms or reports reasonably requested by the other Party in connection with any payment made by the LICENSEE to NOVARTIS under this Agreement.

6. RECORDS; AUDIT RIGHTS

6.1 Relevant Records.

6.1.1 **Relevant Records**. LICENSEE shall keep, and will cause each of its Affiliates or Sublicensees, as applicable, to keep, accurate books and records of accounting for the purpose of calculating all payments due to

NOVARTIS under Section 5 (such payments, collectively the "**Fees**" and such books and records, collectively the "**Relevant Records**"). Such Relevant Records will be kept by LICENSEE or such Affiliate or Sublicensee for [***] following the end of the Calendar Year to which each Relevant Record will pertain.

6.1.2 **Audit Request**. At the request of NOVARTIS, LICENSEE and its Affiliates and Sublicensees shall permit NOVARTIS to engage an independent certified public accounting firm reasonably acceptable to LICENSEE, during normal business hours not more than once a year and upon reasonable notice, to audit the Relevant Records in order to verify, with respect to any Calendar Year, the correctness or completeness of any payment made under this Agreement. The independent certified public accounting firm shall disclose to NOVARTIS only the amounts which the independent certified public accounting firm believes to be inaccurate or due and payable hereunder to NOVARTIS, shall provide a copy of same to LICENSEE and its Affiliates and Sublicensees (as applicable), and shall disclose no other information revealed in such audit. Any and all records of LICENSEE and its Affiliates and Sublicensees examined by such independent certified public accounting firm shall be deemed LICENSEE's Confidential Information, which may not be disclosed by said independent certified public accounting firm to any Third Party or (except for the information expressly sought to be confirmed by NOVARTIS as set forth in this Section 6.1.2) to NOVARTIS.

6.1.3 **Audit Fees and Expenses**. NOVARTIS shall bear any and all fees and expenses incurred by it in connection with any such audit of the Relevant Records; ***provided***, ***however***, in the event an audit reveals an underpayment by LICENSEE of more than [***] as to the period subject to the audit, LICENSEE shall reimburse NOVARTIS for any reasonable and documented out-of-pocket costs and expenses of the audit within [***] after receiving invoices thereof.

6.1.4 **Payment of Deficiency; Dispute**. If such audit or, if the Parties dispute the findings of such audit, an independent accounting firm as described below, concludes that additional payments were owed or that excess payments were made during such period, or if the Parties otherwise agree that additional payments were owed or that excess payments were made during such period, LICENSEE will pay the additional amounts due or NOVARTIS will reimburse such excess payments, within sixty (60) days after the date on which a written report of such audit by the independent accounting firm pursuant to Section 6.1.2 or the report of the final determination of such independent accounting firm is delivered to the Parties pursuant to this Section 6.1.4 or on which the Parties reach such agreement, as the case may be plus interest computed at the 3 month US LIBOR rate as published in the *Wall Street Journal* [***]). In the event of a dispute regarding any audit under Section 6.1.2, the Parties will work in

good faith to resolve the disagreement. If the Parties are unable to reach a mutually acceptable resolution of any such dispute within thirty (30) days, such dispute will be resolved by submitting such dispute to an independent accounting firm mutually agreeable to both Parties, which firm shall render its decision within sixty (60) days after submission of the dispute to such firm. The decision of such firm shall be final and binding upon the Parties, and the costs of such proceeding shall be borne by the Party whose position is such dispute is not affirmed by such firm, or, if such firm does not affirm either Party's position in such dispute, such costs shall be borne between the Parties in such manner as such firm shall determine.

6.1.5 **Confidentiality**. NOVARTIS shall treat all information subject to review under this Section 6.1 in accordance with the confidentiality provisions of Section 9 and the Parties will cause any auditor to enter into a reasonably acceptable confidentiality agreement with LICENSEE obligating such firm to retain all such financial information in confidence pursuant to such confidentiality agreement.

7. INTELLECTUAL PROPERTY RIGHTS

7.1 **Pre-existing IP**. Subject only to the rights expressly granted to the other Party under this Agreement, each Party shall retain all rights, title and interests in and to any Intellectual Property Rights that are owned, licensed or Sublicensed by such Party prior to or independent of this Agreement.

7.2 **Developed IP**. LICENSEE shall own all rights, title and interests in and to any Intellectual Property Rights that are both: (a) related to a Compound or Product; and (b) conceived solely by LICENSEE, its Affiliates or Sublicensees following the Effective Date (collectively, "**Developed IP**").

7.3 **Patent Prosecution and Maintenance of Licensed Patent Rights**.

7.3.1 **Prosecution and Maintenance of Licensed Patent Rights**. NOVARTIS shall be responsible for filing, prosecuting (including in connection with any reexaminations, oppositions and the like) and maintaining the Licensed Patent Rights in the Territory. NOVARTIS shall be responsible for all costs and expenses in connection with such filing, prosecution and maintenance, ***provided that*** if NOVARTIS provides LICENSEE with a notice of intent to abandon, or not file a patent application included in, any of the Licensed Patent Rights at least sixty (60) days in advance of the relevant deadline: (a) NOVARTIS shall no longer be responsible for such costs and expenses relating to filing, prosecuting and maintaining (as applicable) such Licensed Patent Right; (b) LICENSEE may, or may allow a Third Party to, file, prosecute and maintain (in its sole discretion), at its sole cost, such Licensed Patent Right; and (c) upon LICENSEE's request, NOVARTIS shall promptly provide all files related to filing, prosecuting and maintaining such Licensed Patent Right to counsel designated by LICENSEE.

7.3.2 **Cooperation**. NOVARTIS shall provide LICENSEE with material correspondence with the relevant patent offices pertaining to NOVARTIS' prosecution of the Licensed Patent Rights, to the extent that any activities could reasonably relate to the Field or any Compound or Product. On at least a yearly basis, NOVARTIS shall provide to LICENSEE a report detailing the status of all Licensed Patent Rights, including any patent term extensions, and the anticipated expiration dates of any issued Patents. NOVARTIS shall provide LICENSEE a reasonable opportunity to review and comment on proposed submissions to any patent office with respect to the Licensed Patent Rights prior to submission, and NOVARTIS shall consider LICENSEE's comments with respect to such submissions in good faith or, to the extent that TSRI is prosecuting any of the Licensed Patent Rights pursuant to the TSRI Agreement, NOVARTIS shall provide LICENSEE's comments to TSRI.

8. ACTUAL OR THREATENED INFRINGEMENT, DISCLOSURE OR MISAPPROPRIATION.

8.1 **Notification**. Each Party shall promptly notify the other Party in writing of its becoming aware of (a) any actual or threatened infringement, misappropriation or other violation or challenge to the validity, scope or enforceability by a Third Party of any Licensed Technology in the Field ("**Third Party Infringement**"); or (b) initiation by a Third Party of an opposition proceeding against any Licensed Patent Rights, or initiation by LICENSEE of an opposition against a Third Party or any allegation by a Third Party that Intellectual Property Rights owned by it is infringed, misappropriated or violated by the Development, Commercialization or Use of any Compound or Product ("**Defense Action**").

8.2 **Third Party Infringements in the Field**.

8.2.1 **NOVARTIS First Right to Enforce**. On a case by case basis), NOVARTIS will have the first right (but not the obligation) to control enforcement of the Licensed Technology against any Third Party Infringement, at its own expense, in its own name and, subject to this Section 8.2.1, under its own direction and control, or, subject to this Section 8.2.1, settle any such action or proceeding; ***provided***, ***however***, that NOVARTIS will have no right to grant a Sublicense, covenant not to sue or other right with respect to a Compound or Product (including a Generic Equivalent) in the Field in the Territory without the prior written consent of LICENSEE); ***provided further that*** NOVARTIS shall consult with LICENSEE and shall consider LICENSEE's recommendations regarding the proposed suit, action, or proceeding to the extent such Third Party Infringement relates to the Field. NOVARTIS shall not settle, stipulate to any facts or make any admission with respect to any Third

Party Infringement without LICENSEE's prior written consent (not to be unreasonably withheld or delayed) if such settlement, stipulation or admission would: (a) adversely affect the validity, enforceability or scope, or admit non-infringement, of any of the Licensed Technology with respect to the Field; or (b) give rise to liability of LICENSEE or its Affiliates.

8.2.2 LICENSEE shall have the right (but not the obligation) to control enforcement of the Licensed Technology against any Third Party Infringement if (a) such Third Party Infringement is relates solely to the Field; and (b) NOVARTIS provides LICENSEE with written notice that it is not exercising its right to control such enforcement, or (c) if NOVARTIS fails to initiate, or file the relevant response to (as applicable), a suit, action or proceeding with respect to such Third Party Infringement upon the earlier of: (i) expiration of the [***] day period following first receipt by either Party of notice from the other Party of such Third Party Infringement; or (ii) [***] days prior to the deadline for filing, or filing the applicable response to (as applicable), such suit, action or proceeding (including suits, actions or proceedings based on a Third Party's filing pursuant to 42 USC 262). If necessary for LICENSEE to exercise its rights under this Section 8.2.2, and if requested by LICENSEE, NOVARTIS will, at LICENSEE'S expense, act on LICENSEE'S behalf and as LICENSEE's agent under any enforcement right held by NOVARTIS under the TSRI Agreement and, in connection therewith, will act on LICENSEE's instruction and undertake any actions requested by LICENSEE, including bringing any action in any court requested by LICENSEE in NOVARTIS's name.

8.2.3 **Cooperation**. Except as provided in this Section 8.2.3, notwithstanding anything to the contrary herein, the Party that is not controlling the suit, action or proceeding pertaining to enforcement of the Licensed Technology against Third Party Infringement as described in this Section 8.2 may, at its sole discretion and expense (subject to Section 8.3), join as a party to such suit, action or proceeding, ***provided that*** such Party shall join as a party to such suit, action or proceeding upon the reasonable request and expense of the Party controlling such action if necessary for standing purposes. The Party that is not controlling such a suit, action or proceeding shall have the right to be represented by counsel (which shall act in an advisory capacity only, except for matters solely directed to such Party) of its own choice and at its own expense (subject to Section 8.3) in any such suit, action or proceeding.

8.2.4 **Recoveries**. Any and all recoveries resulting from a suit, action or proceeding relating to a claim of Third Party Infringement shall first be applied to reimburse each Party's costs and expenses in connection with such suit, action or proceeding (such recoveries to be applied *pro rata* in accordance with the costs and expenses incurred by each Party, in the

event that the amount of such recoveries is less than the total amount of all such costs and expenses), with any remaining recoveries (a) if such Third Party Infringement is occurring both within and outside the Field, then allocated in accordance with the award in such suit, action or proceeding if such award allocates recoveries based on recoveries within and outside the Field, and if not, then split on a 50:50 basis; (b) retained by NOVARTIS if such Third Party Infringement is occurring solely outside the Field; and (c) retained by LICENSEE if such Third Party Infringement is occurring solely within the Field (the "**Remaining Recoveries**"). Notwithstanding the foregoing, LICENSEE shall pay NOVARTIS Royalty Payments and Sales Milestone Payments in accordance with Section 5 on the Remaining Recoveries retained or received by LICENSEE as if such Remaining Recoveries retained or received by LICENSEE were Net Sales in the Calendar Quarter in which such Remaining Recoveries were retained or received.

8.3 **Defense Actions**. Upon LICENSEE's request, NOVARTIS shall reasonably cooperate with LICENSEE, to the extent necessary to defend LICENSEE or its Affiliates or any Sublicensee of LICENSEE in a Defense Action related to LICENSEE's or its Affiliates or Sublicensee's Development, Commercialization or Use of any Compound or Product in the Field. LICENSEE shall have all authority with respect to any Defense Action, including the right to exclusive control of the defense of any such suit, action or proceeding and the exclusive right to compromise, litigate, settle or otherwise dispose of any such suit, action, or proceeding, ***provided that*** LICENSEE shall keep NOVARTIS timely informed of the proceedings and filings, and provide NOVARTIS with copies of all material communications, pertaining to each Defense Action, and LICENSEE shall not settle, stipulate to any facts or make any admission with respect to any Defense Action without NOVARTIS' prior written consent (not to be unreasonably withheld or delayed) if such settlement, stipulation or admission would (a) adversely affect the validity, enforceability or scope, or admit infringement, of any of the Licensed Technology; (b) give rise to liability of NOVARTIS or its Affiliates; or (c) otherwise impair NOVARTIS' or any of its Affiliates' rights in any Licensed Technology or NOVARTIS' or any of its Affiliates' rights in this Agreement, including rights outside the Field. LICENSEE will reimburse NOVARTIS for its reasonable costs and expenses associated with compliance with this Section 8.3 arising from LICENSEE's or its Affiliates or Sublicensee's Development, Commercialization or Use of any Compound or Product in the Field.

9. CONFIDENTIALITY

9.1 **Definition**. "**Confidential Information**" means the terms and provisions of this Agreement and other proprietary information and data of a financial, commercial or technical nature, that the disclosing Party or any of its Affiliates or Sublicensees has supplied or otherwise made available to the other Party or its Affiliates or Sublicensees, which are disclosed in writing, orally, electronically or

other form, either in connection with the discussions and negotiations pertaining to this Agreement or in the course of performing under this Agreement, which may include information or data that is marked or otherwise identified as confidential or that by its nature a reasonable person would understand to be confidential in connection with this Agreement.

9.2 **Obligations**. During the term of this Agreement and for seven (7) years thereafter (and, with respect to the TSRI IP, during the term of the TSRI Agreement and for three years thereafter), the receiving Party will (a) protect all Confidential Information of the disclosing Party against unauthorized disclosure to Third Parties and (b) not use or disclose the Confidential Information of the disclosing Party, except as permitted by or in furtherance of exercising rights or carrying out obligations hereunder or for internal legal, accounting or finance purposes; *provided*, *however*, that such time period will be extended if and for so long as the disclosing Party maintains the relevant Confidential Information as a trade secret under Applicable Law. The receiving Party shall treat all Confidential Information provided by the disclosing Party with the same degree of care as the receiving Party uses for its own similar information, but in no event less than a reasonable degree of care. The receiving Party may disclose the Confidential Information to its Affiliates and its and their Sublicensees, and their respective directors, officers, employees, subcontractors, consultants, attorneys, accountants, banks and investors (collectively, "**Recipients**") who have a need-to-know such information for purposes related to this Agreement, ***provided that*** the receiving Party shall hold such Recipients to obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement; and ***provided further*** that the receiving Party shall be liable for any action or inaction of its Representatives that would be considered a breach of this Section 9 if committed by the receiving Party.

9.3 **Exceptions to Confidentiality**. The obligations under this Section 9 shall not apply to any information to the extent the receiving Party can demonstrate by competent evidence that such information:

(a) is (at the time of disclosure) or becomes (after the time of disclosure) known to the public or part of the public domain through no breach of this Agreement by the receiving Party or any Recipients to whom it disclosed such information;

(b) was known to, or was otherwise in the possession of, the receiving Party prior to the time of disclosure by the disclosing Party, other than under an obligation of confidentiality;

(c) is disclosed to the receiving Party on a non-confidential basis by a Third Party who is entitled to disclose it without breaching any confidentiality obligation to the disclosing Party; or

(d) is independently developed by or on behalf of the receiving Party or any of its Affiliates, as evidenced by its written records, without use or access to the Confidential Information.

9.4 Permitted Disclosures.

9.4.1 Compliance with Law. The restrictions set forth in this Section 9 shall not apply to any Confidential Information that the receiving Party is required to disclose under Applicable Laws or a court order or other governmental order or to enforce any Licensed Patent Rights under Section 8, ***provided that*** the receiving Party: (a) provides the disclosing Party with prompt notice of such disclosure requirement if legally permitted; (b) to the extent practical, affords the disclosing Party an opportunity to oppose or limit, or secure confidential treatment for such required disclosure; and (c) if the disclosing Party is unsuccessful in its efforts pursuant to subsection (b), discloses only that portion of the Confidential Information that the receiving Party is legally required to disclose as advised by the receiving Party's legal counsel.

9.4.2 Other Permitted Disclosures. Notwithstanding the restrictions set forth in this Section 9, a Party may, without the prior consent of the other Party, disclose Confidential Information:

(a) to Third Parties that have a legitimate need to know such information as part of such Party's financing activities or in connection with any sale or other transfer of such Party's business or assets, solely for the purpose of evaluating or carrying out an actual or potential investment, acquisition or other transaction, ***provided that*** the recipients of such information are bound by written confidentiality obligations consistent with those set forth in this Section 9, and ***provided further*** that such Party shall be liable for any action or inaction of such Third Parties that would be considered a breach of this Section 9 if committed by such Party;

(b) for preparing, filing, prosecuting, or maintaining Patents as permitted by this Agreement;

(c) for making regulatory filings for a Product that such Party has a license or right to develop hereunder in a given country or jurisdiction;

(d) for prosecuting or defending litigation as permitted by this Agreement;

(e) to an underwriter or placement agent or its counsel in connection with any offering by LICENSEE; or

(f) to a permitted assignee of this Agreement.

9.4.3 **LICENSEE Permitted Disclosures**. Notwithstanding the restrictions set forth in this Section 9, in the event that LICENSEE wishes to enter into a Sublicense in accordance with Section 2.2, LICENSEE may disclose to a Third Party Confidential Information of NOVARTIS relating to the Products or Compounds in connection with any such proposed Sublicense, provided that LICENSEE shall hold such Third Parties to written obligations of confidentiality with terms and conditions at least as restrictive as those set forth in this Agreement.

9.5 **Right to Injunctive Relief**. Each Party agrees that breaches of this Section 9 may cause irreparable harm to the other Party and shall entitle such other Party, in addition to any other remedies available to it (subject to the terms of this Agreement), the right to seek injunctive relief enjoining such action. Both Parties agree to waive any requirement that the other post a bond or other security as a condition for obtaining any such relief.

9.6 **Return or Destruction of Confidential Information**. Upon expiration or termination of this Agreement, the receiving Party shall, and shall cause its Recipients to, destroy, delete or return (as requested by the disclosing Party) any Confidential Information of the disclosing Party, except for one copy which may be retained in its confidential files for archive purposes.

10. REPRESENTATIONS, WARRANTIES AND COVENANTS

10.1 **Representations and Warranties by Each Party**. Each Party represents and warrants to the other Party as of the Effective Date that:

(a) it is a corporation duly organized, validly existing, and in good standing under the laws of its jurisdiction of formation;

(b) it has full corporate power and authority to execute, deliver, and perform under this Agreement, and has taken all corporate action required by Applicable Laws and its organizational documents to authorize the execution and delivery of this Agreement and the consummation of the transactions contemplated by this Agreement, and the person or persons executing this Agreement on its behalf has been duly authorized to do;

(c) this Agreement constitutes a valid and binding agreement enforceable against it in accordance with its terms;

(d) all consents, approvals and authorizations from all Governmental Authorities or other Third Parties required to be obtained by such Party in connection with this Agreement have been obtained;

(e) the execution and delivery of this Agreement and all other instruments and documents required to be executed pursuant to this Agreement, and the consummation of the transactions

contemplated hereby do not and shall not: (i) conflict with or result in a breach of any provision of its organizational documents; (ii) result in a breach of any agreement to which it is a party that would impair the performance of its obligations hereunder; (iii) violate any Applicable Laws; or (iv) violate any order, writ, judgment, injunction, decree, determination or award of any court or Governmental Authority presently in effect applicable to it; and

(f) there is no action, suit, proceeding or investigation pending or, to its knowledge, currently threatened in writing against or affecting it that questions the validity of this Agreement or the right of it to enter into this Agreement or consummate the transactions contemplated hereby and, to its knowledge, there is no basis for the foregoing.

10.2 Representations, Warranties and Covenants by NOVARTIS.

10.2.1 NOVARTIS represents and warrants to LICENSEE as of the Effective Date and covenants to LICENSEE as follows:

(a) NOVARTIS owns and Controls the Licensed Patent Rights (other than the Licensed Patent Rights included in the TSRI IP) and the Licensed Know-How (other than the Licensed Patent Rights included in the TSRI IP), and is entitled to grant the licenses specified herein, and other than the Licensed Patent Rights and the Licensed Know-How included in the TSRI IP, all of the Licensed Patent Rights and Licensed Know-How is owned by NOVARTIS;

(b) all Licensed Patent Rights existing on the Effective Date are identified on Schedule A;

(c) NOVARTIS does not Control any Patents, other than those listed on Schedule A, a license to which is necessary to practice the licenses granted herein or to Use the Compounds or Products in the Field;

(d) to the Knowledge of the Patent Associates, (a) the issued Licensed Patent Rights are valid and enforceable Patents and (b) no Patent registration within the issued Licensed Patent Rights is the subject of any pending interference, opposition, cancellation, or patent protest pursuant to 37 C.F.R. § 1.291;

(e) NOVARTIS has not granted to any Third Party any rights or licenses under any of the Licensed Patent Rights or Licensed Know-How that would conflict with the licenses granted to LICENSEE hereunder, and it will not grant any such rights or licenses during the term of this Agreement;

(f) each issued Licensed Patent Right remains in full force and effect and all filing and renewal fees payable with respect to each Licensed Patent Right have been timely paid;

(g) to the Knowledge of the Patent Associates, the Licensed Patent Rights and the Licensed Know-How are free and clear of (i) all mortgages, pledges, charges, liens, equities, security interests, or other encumbrances (other than, in the case of the TSRI IP, rights retained by the United States Government under Applicable Law), and (ii) any covenants that would conflict with or limit the scope of the licenses granted to LICENSEE hereunder;

(h) other than with respect to the TSRI Agreement, NOVARTIS is not subject to any royalty or similar payment obligation to any Third Party with respect to the grant of rights to LICENSEE to practice the Licensed Technology;

(i) to the Knowledge of the Patent Associates and to the Knowledge of the Novartis Deal Team, (i) LICENSEE's Use of Compounds in the Field within the Territory or the practice of the Licensed Technology, as permitted by this Agreement, will not infringe any U.S. Patent owned or Controlled by a Third Party or misappropriate or otherwise violate the Intellectual Property Rights of a Third Party; ***provided***, ***however***, that reagents used in the manufacture protocols described in the Licensed Know-How have not been evaluated for commercial availability and, if implemented in the final commercial manufacture, may require a commercial license from a Third Party, and (ii) , NOVARTIS has not received any written notice from a Third Party, alleging that the Use of the Compounds or Product in the Field within the Territory infringes, misappropriates or otherwise violates the Intellectual Property Rights of a Third Party;

(j) to the Knowledge of the Patent Associates and to the Knowledge of the Novartis Deal Team, there is no claim pending or threatened by NOVARTIS alleging that a Third Party is or was infringing, misappropriating or otherwise violating the Licensed Technology in the Field within the Territory, and, to the Knowledge of the Patent Associates and to the Knowledge of the Novartis Deal Team, there is no reasonable basis for any such allegation;

(k) with respect to any pending applications included in the Licensed Patent Rights, such applications are being prosecuted in the respective patent offices in the countries in the Territory, in accordance with Applicable Law and the attorneys, agents and representatives of NOVARTIS and their respective Affiliates prosecuting such pending applications have submitted all known

material prior art with respect to each pending and issued Licensed Patent Right to the U.S. Patent and Trademark Office or equivalent Governmental Authority in the jurisdiction in which such Patent is issued or pending, in each case as and when required to meet the duty to disclose information material to patentability as required under 37 C.F.R. 1.56 or to comply with analogous Applicable Law outside the United States requiring disclosure of references;

(l) the Knowledge of the Patent Associates, NOVARTIS or its Affiliate has obtained from all inventors of each Patent included in the Licensed Patent Rights (other than those included in the TSRI IP) an assignment to NOVARTIS or its Affiliates, as applicable, of each such inventor's entire rights, title and interests in and to such Licensed Patent Right, and to the Knowledge of the Patent Associates, no current officer, employee, agent, or consultant of Novartis or any of its Affiliates is in violation of any term of any such assignment agreement;

(m) NOVARTIS has taken measures consistent with its ordinary practice to ensure that each Licensed Patent Right properly identifies each and every inventor of the claims thereof as determined in accordance with the laws of the jurisdiction in which such Licensed Patent Right is issued or pending;

(n) NOVARTIS has taken measures consistent with its ordinary practice to protect the secrecy, confidentiality and value of all Licensed Know-How that constitutes trade secrets under Applicable Law (including requiring all employees, consultants and independent contractors to execute binding and enforceable confidentiality agreements and requiring all such employees, consultants and independent contractors to maintain the confidentiality of such Licensed Know-How) and, to the Knowledge of Novartis, such Licensed Know-How has not been used, disclosed to or discovered by any Third Party (other than Licensed Know-How included in the TSRI IP) except pursuant to such confidentiality agreements, and there has not been a breach by any party to such confidentiality agreements, and NOVARTIS will use reasonable efforts to maintain any such trade secrets as such in accordance with Applicable Law;

(o) other than the Licensed Patent Rights included in the TSRI IP, the development of the Licensed Patent Rights were not funded in whole or in part by the government of the United States of America, are not a "subject invention" as that term is described in 35 U.S.C. Section 201(e) and are not otherwise subject to the provisions of the Bayh-Dole Act;

(p) no event has occurred, and no condition or circumstance exists, that would reasonably be expected to (with or without the notice or lapse of time) constitute, or result in, a default under, a breach or violation of, or a failure to comply with any Applicable Law by NOVARTIS, its Affiliates, or its contract research organizations, except for those events, conditions or circumstances which individually or in the aggregate would not have a material adverse effect on the continued use of the Compounds, in the manner that the Compounds had been used by NOVARTIS prior to the Effective Date;

(q) NOVARTIS, its Affiliates and, to the Knowledge of NOVARTIS, its contract research organizations, have generated, prepared, maintained and retained all documentation regarding the Development of the Product that is required to be maintained or retained pursuant to and in accordance with good laboratory and clinical (if applicable) practice and Applicable Law, and all such information is true, complete and correct, except for those failures that would not, individually or in the aggregate, have a material adverse effect on the continued use of the Compounds, in the manner that the Compounds had been used by NOVARTIS prior to the Effective Date;

(r) to the Knowledge of Novartis, neither NOVARTIS nor any of its Affiliates, nor any of its or their respective officers, employees or agents, has (i) committed an act, (ii) made a statement or (iii) failed to act or make a statement, in any case ((i), (ii) or (iii)), that (A) would be or create an untrue statement of material fact or fraudulent statement to the FDA or any other Regulatory Authority with respect to the exploitation of the Compounds or the Product or (B) could reasonably be expected to provide a basis for the FDA to invoke its policy respecting "Fraud, Untrue Statements of Material Facts, Bribery and Illegal Gratuities", set forth in 56 Fed. Reg. 46191 (September 10, 1991) and any amendments thereto or any analogous laws or policies in the Territory, with respect the Exploitation of the Compounds or the Product;

(s) NOVARTIS has filed or caused to be filed with the relevant Regulatory Authorities in the Territory, in each case to the extent required by Applicable Law to be filed by or on behalf of NOVARTIS, all material notices, amendments and annual reports, as well as adverse event reports for the Compounds;

(t) there is no pending action or, to the Knowledge of Novartis, action threatened in writing by relevant Regulatory Authorities to place a clinical hold order on, or otherwise terminate or suspend, any clinical trial authorization for the Product;

(u) NOVARTIS will (i) maintain the TSRI Agreement in full force and effect until the last to expire Patent rights included in that agreement, (ii) not modify or amend the TSRI Agreement in any manner that would be inconsistent with or otherwise contravene the rights and licenses granted to LICENSEE under this Agreement and (iii) will promptly notify LICENSEE of any notice of default or termination received by NOVARTIS with respect to the TSRI Agreement, and in the event of any such default, upon LICENSEE's request, NOVARTIS shall allow LICENSEE to cure any such default on behalf of NOVARTIS, and LICENSEE may offset any costs or expenses for such cure to any payments due to NOVARTIS under this Agreement;

(v) other than the HemOnc IND and the IMD IND, NOVARTIS and its Affiliates do not Control any other Regulatory Filings; and

(w) NOVARTIS has not created, conceived of, or reduced to practice any Jointly Developed Technology (as defined under the TSRI Agreement).

10.3 **No Other Warranties**. EXCEPT AS EXPRESSLY STATED IN THIS SECTION 10, NEITHER PARTY MAKES ANY REPRESENTATIONS OR EXTENDS ANY WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO WARRANTIES OF TITLE, NON-INFRINGEMENT, VALIDITY, ENFORCEABILITY, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

10.4 **Compliance with Applicable Laws**. In the performance of its obligations under this Agreement, each Party shall, and shall ensure all Third Parties that it engages, comply with all Applicable Laws.

11. INDEMNIFICATION

11.1 **Indemnification by LICENSEE**. LICENSEE agrees to indemnify, hold harmless and defend NOVARTIS, its Affiliates, subcontractors and Sublicensees, and their respective officers, directors and employees (collectively, "**NOVARTIS Indemnitees**"), from and against any Losses in connection with Claims arising or resulting from: (a) the manufacture, Development, or Use of the Compound, including the Use of the Compound in Development and Commercialization of Products by LICENSEE Indemnitees, (b) the Development of a Product by, on behalf of or under grant of rights from LICENSEE Indemnitees; (c) the Commercialization of a Product by, on behalf of or under grant of rights from LICENSEE Indemnitees; (d) the gross negligence or wrongful intentional acts or omissions of LICENSEE Indemnities in connection with this Agreement; or (e) any breach by LICENSEE of any representation, warranty or covenant as set forth in this Agreement. As used herein, "**Claims**" means collectively, any and

all Third Party demands, claims, actions and proceedings (whether criminal or civil, in contract, tort or otherwise) for Losses. As used herein, "**Losses**" means any losses, damages, liabilities, costs and expenses (including reasonable attorneys' fees).

11.2 **Indemnification by NOVARTIS**. NOVARTIS agrees to indemnify, hold harmless and defend LICENSEE, its Affiliates, subcontractors or Sublicensees and their respective officers, directors and employees (collectively, "**LICENSEE Indemnitees**") from and against any Claims arising or resulting from: (a) the Development and other Use of the Compounds, including the use of Compounds in the manufacture of therapeutic products, outside of the Field by the NOVARTIS Indemnitees; (b) the gross negligence or wrongful intentional acts or omissions of NOVARTIS Indemnitees in connection with this Agreement; (c) any breach by NOVARTIS of any representation, warranty, obligation or covenant as set forth in this Agreement; or (d) the Use of any Gene-Edited/-Modified HSC Improvement by NOVARTIS Indemnitees.

11.3 **Indemnification Procedures**.

11.3.1 A Party that intends to claim indemnification under this Section 11 (the "**Indemnified Party**") shall provide written notice to the indemnifying Party (the "**Indemnifying Party**") of any Claim as soon as reasonably possible, and in any event no later than within thirty (30) days after the Indemnified Party has actual knowledge of such claim, demand or action (an "**Indemnification Claim Notice**"); provided, however, that, if the Indemnified Party fails to promptly notify the Indemnifying Party pursuant to the foregoing clause, the Indemnifying Party will only be relieved of its indemnification obligation to the extent materially prejudiced by such failure. Such Indemnification Claim Notice shall include a description of the Claim and the nature and amount of any Losses (to the extent that the nature and amount of such Losses are known at such time). Together with the Indemnification Claim Notice, the Indemnified Party shall furnish promptly to the Indemnifying Party copies of all notices and documents (including court papers) received by any Indemnified Party in connection with the Claim.

11.3.2 At its option, the Indemnifying Party may assume the defense and have exclusive control, at its own expense, of any Claim for which indemnity is being sought by giving written notice to the Indemnified Party within thirty (30) days after receipt of the notice of the Claim, provided that (i) it agrees to indemnify the Indemnified Party from and against all Losses the Indemnified Party may suffer arising out of the Claim; (ii) the Claim involves only money damages and does not seek an injunction or other equitable relief against the Indemnified Party; (iii) the Claim does not relate to any criminal or a regulatory enforcement proceeding; and (iv) the Indemnifying Party conducts the defense of the Claim diligently. The Indemnified Party will provide the Indemnifying Party with reasonable

assistance, at the Indemnifying Party's reasonable expense, in the investigation, preparation, defense, and settlement or voluntary disposition of any such claim, demand or action. The Indemnified Party may participate in and monitor such defense with counsel of its own choosing at its sole expense. The Indemnifying Party will have the right to assume and conduct the defense of the Claim with counsel of its choice. The Indemnifying Party will not settle any Claim without the prior written consent of the Indemnified Party, not to be unreasonably withheld, conditioned or delayed, unless the settlement (i) provides for the payment by the Indemnifying Party of money as sole relief for the claimant, (ii) results in the full and general release of the Indemnified Party from all liabilities arising or relating to, or in connection with, the Claim; and (iii) involves no finding or admission of any violation of Applicable Law or the rights of any Person and shall have no effect on any other claims that may be made against the Indemnified Party.

11.3.3 If the Indemnifying Party does not assume and conduct the defense of the Claim as provided in Section 11.3.2, (i) the Indemnified Party may defend against, and consent to the entry of any judgment or enter into any settlement with respect to the Claim in any manner the Indemnified Party may deem reasonably appropriate (and the Indemnified Party need not consult with, or obtain any consent from, the Indemnifying Party in connection therewith), and (ii) the Indemnified Party reserves any right it may have under this Section 11 to obtain indemnification from the Indemnifying Party for Losses.

12. LIMITATION OF LIABILITY. EXCEPT FOR A BREACH OF SECTION 9 OR OBLIGATIONS ARISING UNDER SECTION 11, NEITHER PARTY SHALL BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, INCLUDING DAMAGES FOR LOST PROFITS OR LOST REVENUES REGARDLESS OF WHETHER IT HAS BEEN INFORMED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH DAMAGES OR THE TYPE OF CLAIM, CONTRACT OR TORT (INCLUDING NEGLIGENCE).

13. TERM; TERMINATION

13.1 **Term**. The term of this Agreement shall commence as of the Effective Date and, unless earlier terminated as expressly provided herein, shall expire upon the last-to-expire Royalty Term (the "**Term**").

13.2 **Termination for Cause**.

13.2.1 Each Party shall have the right, without prejudice to any other remedies available to it at law or in equity, to terminate this Agreement in the event the other Party breaches any of its material obligations hereunder or under the Subscription Agreement and fails to cure such breach within [***]

days of receiving notice thereof (the "**Notice Period**") by the other Party; provided, however, that if such breach (i) is not a payment breach; (ii) is capable of being cured, but cannot be cured within the Notice Period, and (iii) the breaching Party initiates good faith actions to cure such breach within the Notice Period and thereafter diligently pursues such actions, the period to cure such breach shall be extended so long as such good faith actions are being diligently pursued by the breaching Party, up to an additional [***] days. Any termination by a Party under this Section 13.2.1 shall be without prejudice to any damages or other legal or equitable remedies to which it may be entitled from the other Party. If either Party initiates a dispute resolution procedure under Section 15 during the Notice Period to resolve the dispute for which termination is being sought and is diligently pursuing such procedure, the cure period set forth in this Section 13.2.1 shall be tolled and the termination shall become effective (i) with respect to any breach that is capable of being cured, if the breaching Party does not implement the remedy determined through such dispute resolution procedure for such breach within the timeframe established through such dispute resolution procedure or (ii) with respect to any breach that is not capable of being cured, upon the final resolution of the dispute if the resolution includes the grant of the terminating Party's request to terminate.

13.2.2 Notwithstanding the foregoing, without limiting any other remedies that LICENSEE may have under this Agreement, if LICENSEE is entitled to terminate this Agreement pursuant to Section 13.2.1, then, rather than terminating this Agreement, LICENSEE may elect, at its sole discretion, by notice in writing to NOVARTIS, to modify this Agreement as follows:

(a) LICENSEE shall continue to pay Milestone Payments pursuant to Section 5.2.1 and Royalty Payments pursuant to Section 5.2.5 pursuant to the terms of the Agreement, but in an amount equal to [***] of the amount otherwise payable by LICENSEE under this Agreement (after applying any deductions or credits to which LICENSEE is entitled in accordance with the terms of this Agreement).

(b) All other rights and obligations of the Parties' under this Agreement shall remain in effect.

13.3 **Termination by LICENSEE**. LICENSEE may terminate this Agreement at will on a Product-by-Product and country-by-country basis, or in its entirety, in its sole discretion, on not less than ninety (90) days prior written notice to NOVARTIS.

13.4 **Termination for a Bankruptcy Event**. Each Party shall have the right to terminate this Agreement in the event of a Bankruptcy Event with respect to the other Party. "**Bankruptcy Event**" means the occurrence of any of the following: (a) the institution of any bankruptcy, receivership, insolvency, reorganization or

other similar proceedings by or against a Party under any bankruptcy, insolvency, or other similar law now or hereinafter in effect, including any section or chapter of the United States Bankruptcy Code, as amended or under any similar laws or statutes of the United States or any state thereof (the "**Bankruptcy Code**"), where in the case of involuntary proceedings such proceedings have not been dismissed or discharged within ninety (90) days after they are instituted; (b) the insolvency or making of an assignment for the benefit of creditors or the admittance by a Party of any involuntary debts as they mature; (c) the institution of any reorganization, arrangement or other readjustment of debt plan of a Party not involving the Bankruptcy Code; (d) appointment of a receiver for all or substantially all of a Party's assets; or (e) any corporate action taken by the board of directors of a Party in furtherance of any of the foregoing actions.

13.5 **Bankruptcy**. If this Agreement is rejected by a Party as a debtor under Section 365 of the Bankruptcy Code, then, notwithstanding anything else in this Agreement to the contrary, all licenses and rights to licenses granted under or pursuant to this Agreement by the Party in bankruptcy to the other Party are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the Bankruptcy Code, or comparable provision of applicable bankruptcy or insolvency laws, licenses of rights to "intellectual property" as defined under Section 101(35A) of the Bankruptcy Code, or comparable provision of applicable bankruptcy or insolvency laws. The Parties agree that a Party that is a licensee of such rights under this Agreement will retain and may fully exercise all of its rights and elections under the U.S. Bankruptcy Code or comparable provision of applicable bankruptcy or insolvency laws. The Parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against a Party to this Agreement under the U.S. Bankruptcy Code or comparable provision of applicable bankruptcy or insolvency laws, the other Party will be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property, and same, if not already in its possession, will be promptly delivered to it (a) upon any such commencement of a bankruptcy or insolvency proceeding upon its written request therefor, unless the bankrupt Party elects to continue to perform all of its obligations under this Agreement, or (b) if not delivered under (a) above, following the rejection of this Agreement by or on behalf of the bankrupt Party upon written request therefor by the other Party. Whenever the bankrupt Party or any of its successors or assigns provides to the other Party any of the intellectual property licensed hereunder (or any embodiment thereof) pursuant to this Section 13.5, the other Party shall have the right to perform the bankrupt Party's obligations hereunder with respect to such intellectual property, but neither such provision nor such performance by the other Party shall release the bankrupt Party from liability resulting from rejection of the license or the failure to perform such obligations. The bankrupt Party shall not interfere with the other Party's rights under this Agreement, or any agreement supplemental hereto, to such intellectual property (including such embodiments), including any right to obtain such intellectual property (or such embodiments) from another entity, to the extent provided in Section 365(n) of the U.S. Bankruptcy Code. All rights, powers and

remedies of the non-subject Party provided herein are in addition to and not in substitution for any and all other rights, powers and remedies now or hereafter existing at law or in equity (including the U.S. Bankruptcy Code) in the event of the commencement of an action under the U.S. Bankruptcy Code with respect to the bankrupt Party. The Parties agree that they intend the following rights to extend to the maximum extent permitted by law, and to be enforceable under U.S. Bankruptcy Code Section 365(n): (x) the right of access to any intellectual property (including all embodiments thereof) of the bankrupt Party, or any Third Party with whom the bankrupt Party contracts to perform an obligation of the bankrupt Party under this Agreement; and (y) the right to contract directly with any Third Party to complete the contracted work.

13.6 Effect of Termination or Expiration.

13.6.1 Upon termination or expiration of this Agreement, LICENSEE shall pay to NOVARTIS all Fees or other amounts due to NOVARTIS as of the effective date of termination or expiration within [***] days following the effective date of termination or expiration.

13.6.2 Upon expiration of this Agreement pursuant to Section 13.1 (but not upon termination of this Agreement), NOVARTIS hereby grants to LICENSEE a royalty-free right and license to Use the Licensed Know-How to Use Compounds and Products within the Territory.

13.6.3 Subject to Section 13.6.4(e), upon termination of this Agreement, (i) all licenses granted by NOVARTIS to LICENSEE will terminate; and (ii) LICENSEE shall have the right to sell its remaining inventory of Products following the termination of this Agreement so long as LICENSEE has fully paid, and continues to fully pay when due, any and all Fees owed to NOVARTIS.

13.6.4 Upon termination of this Agreement:

(a) LICENSEE hereby grants to NOVARTIS a non-exclusive, fully paid-up, royalty-free, worldwide, perpetual and irrevocable license, with the right to sublicense, to Use any and all Developed IP and any other Intellectual Property Rights Controlled by LICENSEE that LICENSEE actually used in the Development, manufacture or Commercialization of the Product as the Product exists at the time of termination ("collectively, "**Reversion IP**"), solely for the Development and Commercialization of the Products ***provided however***, that if any such Reversion IP is in-licensed from a Third Party and subject to payment and other applicable obligations to such Third Party, LICENSEE shall promptly disclose such obligations to NOVARTIS in writing and such Reversion IP shall be subject to the license granted in this Section 13.6.4(a) only if NOVARTIS agrees in writing to reimburse LICENSEE for all

amounts owed to such Third Party as a result of NOVARTIS' exercise of such license and comply with all obligations under any such Third Party license that are applicable to LICENSEE as a Sublicensee thereunder, and thereafter so reimburses LICENSEE and complies with such terms;

(b) to the extent permitted by applicable Regulatory Authorities, LICENSEE shall: (i) transfer to NOVARTIS all Regulatory Filings and Regulatory Approvals held by LICENSEE that are solely related to the Product; and (ii) to the extent subsection (i) is not permitted by the applicable Regulatory Authority and with respect to Regulatory Filings held by LICENSEE that are not solely related to the Product, permit NOVARTIS to cross-reference and rely upon any Regulatory Approvals and Regulatory Filings filed by LICENSEE with respect to the Product solely to Use the Products;

(c) LICENSEE, if requested in writing by NOVARTIS, shall provide any and all material correspondence with the relevant patent offices pertaining to the LICENSEE's prosecution of the Licensed Patent Rights to the extent not previously provided to NOVARTIS during the course of the Agreement;

(d) effective as of the date of termination, LICENSEE hereby grants to NOVARTIS a fully paid-up, royalty-free, worldwide, transferable, sublicensable, perpetual and irrevocable license to use the Trademarks Controlled by LICENSEE solely identifying a Product for the purpose of Commercializing the Products;

(e) LICENSEE will responsibly wind-down, in accordance with accepted pharmaceutical industry norms and ethical practices, any on-going clinical studies of Products for which it has responsibility hereunder in which patient dosing has commenced or, if reasonably practicable and requested by NOVARTIS, allow NOVARTIS or its Affiliates or a Third Party that is designated in writing by NOVARTIS ("**Designated Affiliate/Third Party**") to complete such trials (and then assign to NOVARTIS all related Regulatory Filings, Regulatory Approvals, and investigator and other agreements relating to such studies). LICENSEE shall be responsible for any Development costs associated with such wind-down; ***provided that*** NOVARTIS shall pay all Development costs incurred by either Party to complete such studies should NOVARTIS request that such studies be completed. During any such winding down of ongoing trials, LICENSEE shall provide such knowledge transfer and other training to NOVARTIS or its Designated Affiliate/Third Party as reasonably necessary for NOVARTIS or the Designated Affiliate/Third Party to continue

such trial. In connection with such transfer, LICENSEE shall, at NOVARTIS' option: [***]. As used herein, "**LICENSEE Inventory**" means all components and works in process produced or held by LICENSEE with respect to the manufacture of Products; and

(f) any Sublicense shall, at Sublicensee's option, survive any termination of this Agreement, ***provided that*** the Sublicensee is not in material breach of any of its obligations under such Sublicense such that LICENSEE would have a right to terminate such Sublicense. In connection with the foregoing survival, at the request of Sublicensee, NOVARTIS shall enter into a direct license with the Sublicensee on substantially the same terms as the Sublicense; *provided* that the Sublicense provides for consideration to NOVARTIS that is not less than the amount set forth in this Agreement; and ***provided further that***, notwithstanding anything in this Agreement to the contrary, and whether or not NOVARTIS enters into a direct license with a Sublicensee pursuant to this Section 13.6.4(f), NOVARTIS shall not be required to undertake obligations in addition to those required by this Agreement, and that NOVARTIS' rights under such direct license shall be consistent with its rights under this Agreement, taking into account the scope of the license granted under such direct license.

Notwithstanding the foregoing in this Section 13.6.4, in the event of termination by LICENSEE due to NOVARTIS' material breach under Section 13.2.1, then LICENSEE shall have no obligation whatsoever to grant the licenses or perform any of the actions set forth in Sections 13.6.4(a), (b) and (d) unless and until NOVARTIS makes a payment to LICENSEE equal to the actual amount of Development costs and expenses incurred by LICENSEE and its Affiliates prior to the date of such termination.

13.7 **Survival**. The expiration of the Term or any termination of this Agreement for any reason will be without prejudice to any rights that have accrued to the benefit of any Party prior to such expiration or termination, and any such expiration or termination of this Agreement shall not relieve the Parties of any obligation accruing hereunder prior to such expiration or termination. Without limiting the foregoing, the provisions of Sections 1 (*Definitions*), 2.2 (*Cross License to Licensed Patent Rights Improvements*), 5.2 (*Milestones and Royalty Payments*), 5.3 (*Payment Method*) (to the extent payments are due hereunder), 5.4 (*Taxes*), 6 (*Records; Audit Rights*), 7.1 (*Pre-existing IP*), 7.2 (*Developed IP*), 9 (*Confidentiality*), 11 (*Indemnification*), 12 (*Limitation of Liability*), 13.6 (*Effect of Termination or Expiration*), 14 (*Publicity and Publications*), 16 (*Dispute Resolution*) and 17 (*General Provisions*) shall survive expiration or termination of this Agreement.

13.8 **Termination Not Sole Remedy**. Termination is not the sole remedy under this Agreement and, whether or not termination is effected and notwithstanding anything contained in this Agreement to the contrary, all other remedies will remain available except as agreed to otherwise herein. For the avoidance of doubt, nothing in this Agreement shall obligate a Party to terminate this Agreement in the event that the other Party breaches any obligation of this Agreement, and failure to terminate this Agreement shall not prohibit or modify the recovery of damages.

14. PUBLICITY AND PUBLICATIONS

14.1 **Publicity and Publications**.

14.1.1 **Use of Trademarks**. Subject to NOVARTIS' rights pursuant to Section 13.6.4(d), neither Party (nor any of its Affiliates or agents) shall use the Trademarks of the other Party or its Affiliates in any press release, publication or other form of promotional disclosure without the prior written consent of the other Party in each instance.

14.1.2 **Public Statements**. Except as expressly set forth herein, each Party agrees not to issue any press release or other public statement or any information relating to this Agreement, whether written, electronic, oral or otherwise, disclosing the existence of this Agreement or the terms hereof or any other information relating to this Agreement without the prior written consent of the other Party; ***provided, however***, that neither Party will be prevented from complying with any duty of disclosure it may have pursuant to Applicable Laws or the rules of any recognized stock exchange, including disclosure of the terms of this Agreement, so long as the disclosing Party provides the other Party at least ten (10) Business Days prior written notice to the extent practicable and only discloses information to the extent required by Applicable Law or the rules of any recognized stock exchange. Promptly after the Effective Date, the Parties will agree upon and release a mutual press release to announce the execution of this Agreement.

14.1.3 **Publications**. LICENSEE acknowledges that NOVARTIS personnel may desire to publish in scientific journals or present at scientific conferences scientific, pre-clinical or clinical data derived from research and development related to the Compounds and Products in the Field that was conducted by NOVARTIS or its Affiliates prior to the Effective Date. No such publication will be submitted and no such presentation shall be made unless a written copy of such proposed publication or presentation is submitted to LICENSEE no later than thirty (30) days before submission for publication or presentation. LICENSEE shall provide its comments with respect to such publications and presentations within fifteen (15) days after its receipt of such written copy from NOVARTIS. NOVARTIS shall consider in good faith all comments made by LICENSEE, including

limitations on disclosure of NOVARTIS confidential information requested by LICENSEE consistent with what NOVARTIS would consider normal procedure for its own development compounds. LICENSEE and NOVARTIS will each comply with standard academic practice regarding authorship of scientific publications and recognition of contribution of other parties in any publication.

15. **LICENSEE INSURANCE**. LICENSEE shall maintain insurance during the Term, at its sole cost and expense, of the types and in amounts which are reasonable and customary in the U.S. pharmaceutical industry for companies of comparable size and activities obtained from a reputable insurer to protect against potential liabilities and risk arising out of activities to be performed under this Agreement and upon such terms (including coverages and deductible limits) as are customary in the U.S. pharmaceutical industry generally for the activities to be conducted by LICENSEE under this Agreement. Upon written request from NOVARTIS, LICENSEE shall promptly provide written evidence (e.g., certificates) of such insurance to NOVARTIS.

16. **DISPUTE RESOLUTION**

16.1 **General**. Promptly after the written request of either Party, each of the Parties shall appoint a designated representative to meet in person or by telephone to attempt in good faith to resolve any dispute that arises under this Agreement. If the designated representatives do not resolve the dispute within thirty (30) days of such request, then a senior executive of each Party shall meet in person or by telephone to review and attempt to resolve the dispute in good faith. The senior executives shall have thirty (30) days to attempt to resolve the dispute. If the senior executives cannot resolve such dispute within such period of time, then either Party shall have the right to institute binding arbitration as set forth in Section 16.2 upon written notice to the other Party. If a Party's rights would be adversely affected as a result of the passage of time that would occur by participating in the dispute resolution mechanism set forth above, such Party may commence binding arbitration prior to or during the course of such dispute resolution mechanism.

16.2 **Arbitration**. Subject to Section 16.1, all controversies, disputes or claims arising out of or relating to this Agreement or any alleged breach hereof, will be settled exclusively by binding arbitration administered by the American Arbitration Association ("**AAA**") pursuant to its Commercial Arbitration Rules then in effect, as supplemented by discovery pursuant to the Federal Rules of Civil Procedure. The place of arbitration shall be Boston, Massachusetts. The arbitration panel shall consist of a single neutral and independent arbitrator who is reasonably knowledgeable about the pharmaceutical industry and the subject matter at issue in the dispute (the "**Arbitrator**"). The Parties to the arbitration shall mutually agree on the Arbitrator. If the Parties cannot agree on an Arbitrator, the AAA shall select the Arbitrator, and the Arbitrator shall be and remain independent of the Parties. The Arbitrator shall determine what discovery will be permitted, consistent with the goal of reasonably controlling the cost and time that the

Parties must expend for discovery; provided that the Arbitrator shall permit such discovery as he or she deems necessary to permit an equitable resolution of the dispute. The Parties shall use reasonable efforts to expedite the arbitration if requested by either Party. The Arbitrator shall, within fifteen (15) days after the conclusion of the arbitration hearing, issue a written award and statement of decision describing the essential findings and conclusions on which the award is based, including the calculation of any damages awarded. The award shall be final and binding on the Parties and non-appealable, and judgment upon the award rendered by the Arbitrator may be entered in any court of competent jurisdiction. The proceedings and the final award shall be confidential. All arbitration proceedings must be completed within one hundred eighty (180) days of the date of the notice instituting arbitration proceedings provided by a Party to the other Party pursuant to Section 16.1 or as soon as practicable thereafter. The question of arbitrability and whether a claim, dispute or other matter in question would be barred by the applicable statute of limitations, which statute of limitations also shall apply to any claim or dispute subject to arbitration under this Agreement, shall be determined by binding arbitration pursuant to this Section 16.2. Each Party shall bear its own fees costs and expenses (including attorneys' fees and expenses), arising out of the arbitration described in this Section 16.2, and shall pay an equal share of the fees, costs and expenses of the Arbitrator and all other general fees related to the arbitration; provided, however, that the Arbitrator shall be authorized to allocate fees and expenses in a way that bears a reasonable relationship to the outcome of the arbitration, with the Party prevailing on more issues, or on issues of greater value or gravity, recovering a relatively larger share of its legal fees and expenses. Unless the Parties otherwise agree in writing, during the period of time that any arbitration proceeding is pending under this Agreement, the Parties shall continue to comply with all those terms and provisions of this Agreement that are not the subject of the pending arbitration proceeding.

16.3 **Injunctive Relief**. Notwithstanding the foregoing, in the event of an actual or threatened breach hereunder, the aggrieved Party may seek equitable relief (including restraining orders, specific performance or other injunctive relief) in any court or other forum, without first submitting to the dispute resolution procedures set forth in Sections 16.1 or 16.2.

17. GENERAL PROVISIONS

17.1 **Assignment**. LICENSEE may not assign its rights and obligations under this Agreement without NOVARTIS' prior written consent, except that: (a) LICENSEE may assign its rights and obligations under this Agreement in whole or in part to one or more of its Affiliates without the consent of NOVARTIS; and (b) LICENSEE may assign this Agreement in the event of a Change in Control. LICENSEE shall provide NOVARTIS with prompt written notice of any such assignment. Any attempted assignment in contravention of the foregoing shall be void. NOVARTIS may assign its rights and obligations under this Agreement in whole or in part to one or more of its Affiliates without LICENSEE's consent.

17.2 **Severability**. Should one or more of the provisions of this Agreement become void or unenforceable as a matter of law, then such provision will be ineffective only to the extent of such prohibition or invalidity, without invalidating the remainder of this Agreement, and the Parties agree to substitute a valid and enforceable provision therefor which, as nearly as possible, achieves the desired economic effect and mutual understanding of the Parties under this Agreement.

17.3 **Governing Law**. This Agreement shall be governed by and construed under the laws in effect in the State of New York, without giving effect to any conflicts of laws provision thereof or of any other jurisdiction that would produce a contrary result.

17.4 **Force Majeure**. Any delay or nonperformance by such Party, for a period of up to 90 days, will not be considered a breach of this Agreement to the extent such delay or nonperformance is caused by acts of God, natural disasters, acts of the government or civil or military authority, fire, floods, epidemics, quarantine, energy crises, war or riots or other similar cause outside of the reasonable control of such Party (each, a "**Force Majeure Event**"), ***provided that*** the Party affected by such Force Majeure Event will promptly begin or resume performance as soon as reasonably practicable after the event has abated.

17.5 **Waivers and Amendments**. The failure of any Party to assert a right hereunder or to insist upon compliance with any term or condition of this Agreement shall not constitute a waiver of that right or excuse a similar subsequent failure to perform any such term or condition by the other Party. No waiver shall be effective unless it has been given in writing and signed by the Party giving such waiver. No provision of this Agreement may be amended or modified other than by a written document signed by authorized representatives of each Party.

17.6 **Relationship of the Parties**. Nothing contained in this Agreement shall be deemed to constitute a partnership, joint venture, or legal entity of any type between NOVARTIS and LICENSEE, or to constitute one Party as the agent of the other. Moreover, each Party agrees not to construe this Agreement, or any of the transactions contemplated hereby, as a partnership for any tax purposes. Each Party shall act solely as an independent contractor, and nothing in this Agreement shall be construed to give any Party the power or authority to act for, bind, or commit the other Party.

17.7 **Successors and Assigns**. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and permitted assigns.

17.8 **Notices**. All notices, consents, waivers, and other communications under this Agreement must be in writing and will be deemed to have been duly given when: (a) delivered by hand (with written confirmation of receipt); or (b) when received

by the addressee, if sent by an internationally recognized overnight delivery service (receipt requested), in each case to the appropriate addresses set forth below (or to such other addresses as a Party may designate by written notice):

If to NOVARTIS:

Novartis International Pharmaceutical Ltd.
Lichtstrasse 35
CH-4056 Basel
Switzerland
Attn: Head, NIBR Legal Europe

With a required copy to:

Novartis Institutes for BioMedical Research, Inc.
250 Massachusetts Avenue
Cambridge, MA 02139 USA
Attn: General Counsel

If to LICENSEE:

Magenta Therapeutics, Inc.
50 Hampshire Street, 8th Floor
Cambridge MA 02139
Attn: Bastiano Sanna and Christina Isacson

With a copy to:
Ropes & Gray LLP
Attn: Marc A. Rubenstein
Prudential Tower
800 Boylston St.
Boston, MA 02199-3600

17.9 **Further Assurances**. LICENSEE and NOVARTIS hereby covenant and agree without the necessity of any further consideration, to execute, acknowledge and deliver any and all such other documents and take any such other action as may be reasonably necessary or appropriate to carry out the intent and purposes of this Agreement.

17.10 **No Third Party Beneficiary Rights**. This Agreement is not intended to and shall not be construed to give any Third Party any interest or rights (including, without limitation, any third party beneficiary rights) with respect to or in connection with any agreement or provision contained herein or contemplated hereby.

17.11 **Entire Agreement; Confidentiality Agreement**. This Agreement, together with its Schedules, sets forth the entire agreement and understanding of the Parties as to the subject matter hereof and supersedes all proposals, oral or written, and all other prior communications between the Parties with respect to such subject

matter, including, without limitation, that certain letter agreement by and between the Parties, dated November 16, 2016 (the "**CDA**"). The Parties acknowledge and agree that, as of the Effective Date, all Confidential Information (as defined in the CDA) disclosed by a Party or its Affiliates pursuant to the CDA shall be considered the Confidential Information of such Party and shall be subject to the terms set forth in this Agreement. In the event of any conflict between a material provision of this Agreement and any Schedule hereto, the Agreement shall control.

17.12 **Counterparts**. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. An executed signature page of this Agreement delivered by facsimile transmission or other electronic format shall be as effective as an original executed signature page.

17.13 **Cumulative Remedies**. No remedy referred to in this Agreement is intended to be exclusive, but each shall be cumulative and in addition to any other remedy referred to in this Agreement or otherwise available under law.

17.14 **Waiver of Rule of Construction**. Each Party has had the opportunity to consult with counsel in connection with the review, drafting and negotiation of this Agreement. Accordingly, any rule of construction that any ambiguity in this Agreement shall be construed against the drafting Party shall not apply.

17.15 **Construction**. For purposes of this Agreement: (a) words in the singular shall be held to include the plural and vice versa as the context requires; (b) the words "including" and "include" shall mean "including, without limitation," unless otherwise specified; (c) the terms "hereof," "herein," "herewith," and "hereunder," and words of similar import shall, unless otherwise stated, be construed to refer to this Agreement as a whole and not to any particular provision of this Agreement; (d) all references to "Section", "Schedule" and "Exhibit," unless otherwise specified, are intended to refer to a Section, Schedule or Exhibit of or to this Agreement; and (e) the term "or" shall be interpreted in the inclusive sense commonly associated with the term "and/or."

[*Signatures on next page*]

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IN WITNESS WHEREOF, the Parties intending to be bound have caused this Agreement to be executed by their duly authorized representatives as of the Effective Date.

NOVARTIS INTERNATIONAL PHARMACEUTICAL LTD.

By: /s/ Lars Windhern
Name: Lars Windhern
Title: Head Finance NIBR Europe

By: /s/ Simon Pfirter
Name: Simon Pfirter
Title: Authorized Signatory

MAGENTA THERAPEUTICS, INC.

By: /s/ Bastiano Sanna
Name: Bastiano Sanna
Title: Chief Operating Officer

Schedule 1.41

Knowledge of the Patent Associates

[***]

Schedule 1.74

Ultra Orphan Indications

[***]

SCHEDULE A

Licensed Patent Rights

[***]

SCHEDULE B-1

(a) Documents for Manufacturing of Product

Media -fill protocols and reports	[***]
Process B - BPRs	[***]
Comparability report A' vs B (fresh vs cryo)	[***]
Cryo stability depleted fraction (incl comparability vials vs bags)	[***]
Cryo stability expanded fraction (incl comparability vials vs bags)	[***]
Site-to-site comparability (Apceth vs MCT)	[***]
CMM stability report	[***]
Compatibility report	[***]
Engineering runs report process B at Apceth	[***]
Day 0 report	[***]
Analytical methods, protocols & reports	[***]
Process B - release specifications	[***]
List Raw Materials and Testing for Raw Materials	[***]
List QC materials	[***]
SFEM: pre-clinical report	[***]

(b) [***] Chemistry & Manufacturing Control Documents

1 Drug Substance

Certificate of Analysis

- For batch that will be transferred (No update according to latest specifications are planned)

2 Drug Product

A. Manufacture

- Drug Product Manufacturing Instructions

B. Drug Product Data

- Drug Product Specifications for early phase clinical development
- Drug Product Analytical Methods
- Drug Product Development Stability Report for development batches

C. Certificate of Analysis

- For batches that will be transferred (No update according to latest specifications are planned)

4 Environmental Health and Safety

- Safety Data Sheets of raw materials, intermediates, drug substance.

(c) Analytical Methods and Qualifications for HSC835

[***]

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(d) Regulatory Documents

(Attached)

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US Regulatory Record Indexing Report for INDs

Application/ Registration Number	Product Code	Submission Date	Submission Folder Name	Content Summary	Submission Type Description	Serial/ Supplement Number
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(e) Market Analysis Material

(in PDF unless otherwise specified)

[***]

[***]

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SCHEDULE B-2

Transfer Activities

1. Regulatory Transfer Activities. The regulatory transfer activities shall be those activities set forth in this Section 1 of this Schedule.

1.1. Right of Reference of HemOnc IND: Within [***] days after the Effective Date, NOVARTIS shall provide to LICENSEE a copy of the HemOnc IND (in .pdf form) and will permit LICENSEE to reference the HemOnc IND pursuant to Section 4.3.1(a) of the Agreement, to enable LICENSEE to Develop and Commercialize Products in the Field that were submitted to the FDA by NOVARTIS prior to the Effective Date. At any time after LICENSEE's receipt from NOVARTIS of a copy of the HemOnc IND, and a copy of the letter from Novartis to FDA granting the LICENSEE right of reference, the LICENSEE may provide to the applicable Regulatory Authority written notification (and any related necessary documents) of the right of reference of the HemOnc IND.

1.2. Assignment of IMD IND:

1.2.1. Within [***] days after written notification from LICENSEE that LICENSEE is able to assume all clinical, regulatory, and safety obligations (the "LICENSEE Assumption Notice") regarding the IMD IND, and in no event longer than [***] days from the Effective Date, NOVARTIS shall execute and provide to LICENSEE documents (in a .pdf form) reasonably required to transfer the sponsorship of the IMD IND to LICENSEE.

1.2.2. Within [***] Business Days after LICENSEE's receipt from NOVARTIS of the documents described in Section 1.2.1 of this Schedule, LICENSEE shall provide to the applicable Regulatory Authority written notification (and any related necessary documents) of the transfer of sponsorship of the IMD IND from NOVARTIS to LICENSEE ("LICENSEE Transfer Notice"). LICENSEE shall provide to NOVARTIS a copy of the LICENSEE Transfer Notice. In addition, LICENSEE shall provide to NOVARTIS a copy of any and all notices received by LICENSEE from the applicable Regulatory Authority confirming transfer of the IMD IND from NOVARTIS to LICENSEE ("Regulatory Confirmation Notice").

1.2.3. For the period beginning on the Effective Date and ending on the effective date of the transfer to LICENSEE of the IMD IND (Le,, the date that LICENSEE serves official confirmation of acceptance of regulatory transfer of responsibility) (the "Regulatory Transfer Period"), NOVARTIS shall continue to maintain the IMD IND. For clarity, (a) during the Regulatory Transfer Period, NOVARTIS shall not be permitted to cancel or withdraw the IMD IND, and (b) NOVARTIS will file on a timely basis any annual report for the IMD IND due during the Regulatory Transfer Period.

2. Documentation Transfer

2.1. Initial Request. No later than thirty (30) days after the Effective Date (unless otherwise specified within Schedule B-1 or agreed to in writing by the Parties), NOVARTIS will provide to LICENSEE, copies of those documents set forth in Section 2.3 of this Schedule (the "Documentation").

2.2. Method of Transfer. Notwithstanding the foregoing, the Parties agree as follows with respect to the Documentation: NOVARTIS will provide electronic copies (in .pdf form unless otherwise specified) of the Documentation by a method reasonably acceptable to LICENSEE; provided that, to the extent such Documentation exists as of the Effective Date in an electronic format, NOVARTIS shall provide to LICENSEE an electronic copy of such Documentation and to the extent such Documentation does not exist in an electronic format as of the Effective Date, NOVARTIS shall provide to LICENSEE a physical copy of the Documentation. Notwithstanding the foregoing, in no event shall NOVARTIS be required to provide (i) data or records that include technology or products other than those that pertain to the Compounds, or (ii) laboratory notebooks, internal team meeting minutes, personal notes of NOVARTIS employees or any of NOVARTIS' contractors or subcontractors, or internal intra-NOVARTIS correspondence.

2.3. Documentation. The Documentation shall be comprised of the following documents to the extent containing Licensed Know-How and Controlled by NOVARTIS or its Affiliates as of the Effective Date:

2.3.1. Regulatory and Manufacturing, As identified in Schedule B-1.

2.3.2. Market Analysis Materials. As identified in Schedule B-1. This section of Schedule B-1 is not subject to further revision pursuant to Section 3.2 of the Agreement. Materials will be provided "as is" with no warranty as to completeness or correctness and LICENSEE assumes full responsibility in using such Market Access Materials or any data or information contained therein.

2.3.3. Clinical Development. Copies of the following items that are Controlled by NOVARTIS, its Affiliates or the University of Minnesota (in the case of the University of Minnesota, in NOVARTIS' possession) in each case below, solely as they relate to the HemOnc IND and the IMD IND:

2.3.3.1. An electronic copy of the then current databases as of the Effective Date, (a) the clinical study database, (b) the safety database, and (c) the PK and biomarker database. In addition, for study 2204, Novartis will refresh the safety database annually, or on an as requested basis, in no case more frequently than on a semi-annual basis;

2.3.3.2. material protocols and amendments, study reports and results (including tables, figures and data);

2.3.3.3. All adverse event reports (e.g., Medwatch or equivalent forms);

2.3.3.4. Case Report Forms (CRFs) or equivalents thereof for all completed clinical studies of the Products (i.e., studies with signed-off final clinical study reports);

2.3.3.5. An electronic copy of clinical study raw data from clinical studies included in study databases;

2.3.3.6. all Trial Master Files (TMF's) or equivalents thereof, to the extent such TMFs are in NOVARTIS' or its Affiliates' possession; and

2.3.3.7. To the extent any of the Documentation set forth in Sections 2.3.3.1—2.3.3.6 is in possession of the University of Minnesota as of the Effective Date, then Novartis agrees to notify the University of Minnesota of the license grant under this Agreement and will reasonably cooperate with LICENSEE to request and obtain such Documentation.

2.3.4. Intellectual Property. Copies of file wrappers for the Licensed Patent Rights in the Major Markets, will be delivered to LICENSEE within thirty (30) days of the Effective Date; records will be provided in ..pdf form.

3. **Access to Certain NOVARTIS Employees**. For the period beginning on the Effective Date and ending [***] months after the Effective Date, NOVARTIS shall make the employees set forth on Schedule 3 available to assist LICENSEE or its designee from time to time as reasonably requested by LICENSEE (to the extent the same continue to work for NOVARTIS or its Affiliates) in order to provide LICENSEE with Information relating to the Development and manufacture of the Compounds and Products, [***].

4. **Conflicts**. In the event of any conflict between this Schedule B-2 and the main text of the Agreement, the main text of the Agreement shall govern.

Schedule 3

NOVARTIS Employees

[***]

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

BE THE MATCH BIOTHERAPIES®
COLLABORATION AGREEMENT

This Collaboration Agreement (including all attachments hereto, this "Agreement") is entered into and made effective November 10, 2017, by and between Be The Match BioTherapies ("**BTMB**"), a Minnesota nonprofit corporation, having its headquarters at 500 North 5th Street, Minneapolis, MN 55401, and Magenta Therapeutics, Inc., a Delaware corporation ("**Magenta**"), having a principal place of business at 50 Hampshire St, Cambridge, MA 02139 (each a "**Party**" and collectively the "**Parties**").

RECITALS

WHEREAS, it is the mutual intention of the Parties to formalize and advance the relationship developed under the Memorandum of Understanding, acknowledged and agreed to by the Parties on April 21, 2017 (the "**MOU**"); and

WHEREAS, the Parties desire to further their strategic, collaborative, and scientific collaboration to enhance Magenta's clinical trial designs and product development by utilizing BTMB's expertise in cellular therapies and transplantation.

AGREEMENT

NOW THEREFORE, in consideration of the foregoing and of the obligations and promises contained in this Agreement, the sufficiency of which is acknowledged, the Parties hereby agree as follows:

1. **Provision of Services.** BTMB agrees to perform the work set forth in the Rider(s) attached hereto as Attachment A (hereafter referred to as the "**Services**"). The Parties may, by mutual written agreement, add additional Rider(s) to this Agreement from time to time during the Term of this Agreement. Each Rider is hereby incorporated by reference as an integral part of and will be subject to the terms and conditions of this Agreement upon execution by both BTMB and Magenta. In the event that any term or condition of this Agreement is inconsistent with any term or condition set forth in the corresponding Rider(s), the term or condition of this Agreement shall prevail, unless such Rider expressly amends a provision of this Agreement, in which case the terms or conditions of the Rider prevails with respect to the Services described in such Rider. The Parties warrant that all respective obligations will be performed in accordance with the terms of this Agreement and the corresponding Rider(s).

2. **Term.** The term of this Agreement shall commence on the effective date set forth above and continue and remain in effect until December 31, 2020 or until this Agreement is terminated as provided for in Section 9, "**Termination**".

3. **Compensation.** Magenta will pay BTMB for Services performed under and meeting the requirements of this Agreement and corresponding Rider(s).

(a) **Expenses.** Magenta shall not be responsible for reimbursement of any expenses paid or incurred by BTMB unless otherwise agreed to by the Parties in the corresponding Rider(s).

(b) **Invoice.** BTMB will submit to Magenta an invoice subject to the invoice terms in the corresponding Rider(s).

(c) **Payment.** Magenta will pay to BTMB all amounts set forth in each invoice that are not the subject of a good faith dispute according to the payment terms in the corresponding Rider(s).

4. **Audit and Records.** Financial records, supporting documentation, statistical records and any other records related or pertaining to the Agreement shall be retained by BTMB for a period of [***].

5. **Indemnity.** Each Party shall indemnify, defend and hold the other Party harmless from any and all third party claims, losses, liabilities, costs and expenses (including, without limitation, reasonable attorneys' fees and expenses arising out of the defense of any claim) arising out of the negligence, malpractice or negligent acts or omissions of such Party, its respective officers, directors, subcontractors, consultants and employees in carrying out their responsibilities under this Agreement. BTMB will not indemnify, defend or hold Magenta harmless from any and all third party claims, losses, liabilities, costs and expenses (including, without limitation, reasonable attorneys' fees) arising out of any act, error or omission of Magenta which is fraudulent, criminal or malicious.

In addition, each Party shall indemnify, defend and hold the other Party harmless against any claim that any information, design, specification, instruction, software, data or material furnished by one Party and used by the other Party pursuant to this Agreement infringes a valid copyright, trademark, patent or trade secret of any third party.

6. **Notice of Claims and Indemnification Procedure.** Promptly following the receipt by either Party of notice or knowledge of a claim made by a third party against either Party or its respective officers, directors, employees or agents for which indemnification and defense under this Agreement is owed by BTMB and/or Magenta, the indemnified Party shall promptly provide the other Party with written notice of such claim. The written notice shall provide comprehensive detail as to the nature and facts regarding the claim then known to the indemnified Party. The indemnifying Party will have the right to assume and control the defense of such claim at its own expense with counsel selected by the indemnifying Party. The indemnified Party shall cooperate in the defense of the claim and may, at its own expense, associate its own attorneys in the defense of a claim handled by the indemnifying Party pursuant to this Section 6. Neither Party will settle or compromise any claim without the prior written consent of the other Party (not to be unreasonably withheld).

7. **Limitation of Liability.** Magenta shall be solely responsible for the legal consequences of acting upon any of BTMB's advice or recommendations. IN NO EVENT WILL BTMB BE RESPONSIBLE OR LIABLE FOR ANY LOSS BY MAGENTA OF ANY KIND, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS OR OPPORTUNITY, FOR ANY DECLINE IN THE VALUE OF BUSINESS OR ASSETS, FOR ANY CONSEQUENCES OF ANY ACTION TAKEN OR OMITTED TO BE TAKEN BY MAGENTA, OR FOR ANY OTHER DIRECT, INDIRECT, FINANCIAL, OR CONSEQUENTIAL LOSS OR LIABILITY, EXCEPT TO THE EXTENT SUCH LOSS IS CAUSED BY BTMB'S GROSS NEGLIGENCE, WILLFUL MISCONDUCT, FRAUD, OR BREACH OF THIS AGREEMENT. NEITHER PARTY'S LIABILITY RELATED TO THIS AGREEMENT WILL EXCEED [***].

8. **Insurance.** Both Parties warrant that each Party has procured and maintains, at each Party's own expense, a policy or policies of insurance, or an effective self-insurance program insuring against any claims, liabilities, damages, or judgments that may arise as a result of carrying out the respective responsibilities of each Party under this Agreement.

9. **Termination.** This Agreement and any Rider may be terminated in whole or in part:

(a) by mutual written agreement of the Parties at any time;

(b) by either Party at any time, with or without cause, upon [***] written notice to the other Party, unless otherwise specified in the corresponding project Rider. During the [***] period after such notice is sent, the Parties shall continue to act toward each other in good faith;

(c) by either Party if the other Party has materially breached or failed to perform any of its obligations under this Agreement, which breach or failure continues uncured for a period of [***] after the breaching Party's receipt of written notice specifying the breach; or

(d) by either Party upon insolvency or bankruptcy of the other Party.

Upon receipt of notice of termination of this Agreement, BTMB shall immediately cease performance of its Services unless specifically instructed otherwise in writing by Magenta. BTMB agrees to return to Magenta within [***] of the effective date of termination all work product (including works in progress) completed through the effective date of termination and any Confidential Information disclosed, provided, or made available by Magenta under this Agreement or any Rider. Magenta agrees to pay BTMB for all monies due and owing to BTMB for Services actually performed in accordance with this Agreement through the effective date of termination and BTMB will promptly refund to Magenta any monies paid by Magenta in advance for Services not rendered.

10. **Proprietary Rights.** Unless as otherwise provided in a specific Rider, any and all information, data, documentation, plans, reports, formulations, processes, methods, discoveries, improvements, developments, records, work product (including works-in-process) and deliverables resulting from the Services that are created, conceived, developed or reduced to practice in relation to Magenta's Confidential Information or otherwise as a result of Services (the "**Deliverables**") will be exclusively owned by Magenta. BTMB acknowledges that all work performed by BTMB is on a "work for hire" basis. BTMB hereby assigns, and agrees to assign to Magenta, all of its worldwide right, title and interest in and to all Deliverables, including all related intellectual property rights. BTMB will execute any and all applications, assignments or other instructions and take all actions that are reasonably requested by Magenta for the perfection of the foregoing assignment and to fully implement Magenta's rights, title and interest in the Deliverables, including all related intellectual property rights. It is the intent of the Parties that all right, title and interest a Party may have in and to any materials, information or work product, including but not limited to copyrights, patents, and trade secret rights therein that pre-existed this Agreement ("**Existing Intellectual Property**") are and shall remain the sole property of that Party. To the extent any of BTMB's Existing Intellectual Property is incorporated into any Deliverables or the use of any of BTMB's Existing Intellectual Property is otherwise necessary to use any Deliverable, BTMB hereby grants to Magenta a perpetual, irrevocable, fully paid-up, royalty-free, non-exclusive, worldwide license (with the full right to sublicense directly or indirectly through multiple tiers) to (a) copy, distribute, display, perform, create derivative works of and otherwise use and fully exploit BTMB's Existing Intellectual Property solely in connection with Magenta's use of the Deliverables. For the avoidance of doubt, in the event of a conflict between this Section 10 and terms of any Rider, the provisions in the Rider shall prevail.

11. **Publications and Presentations.** Unless as otherwise provided in a specific Rider, neither Party shall prepare abstracts, manuscripts, materials, or presentations that reference the other Party or the other Party's services without the prior written approval of the other Party. Requests for prior approval by each Party must be sent to the other Party's point of contact identified in the corresponding Rider(s) [***] prior to the date of desired publication or presentation. For the avoidance of doubt, in the event of a conflict between this Section 11 and terms of any Rider, the provisions in the Rider shall prevail.

12. **Confidentiality and Non-Disclosure**. Unless as otherwise provided in a specific Rider, all information, materials, discussions and proceedings (including but not limited to proprietary and trade secret information) which are transferred, disclosed or made available by or on behalf of the disclosing Party ("**Confidential information**") are, and shall be held and maintained by each Party as, confidential. Information will not be deemed Confidential Information hereunder if such information: (1) is known or becomes known (independently of disclosure by the disclosing Party) to the receiving Party prior to receipt from the disclosing Party from a source other than one having an obligation of confidentiality to the disclosing Party; (2) becomes publicly known, except through a breach hereof by the receiving Party; or (3) is independently developed by the receiving Party, which can be shown by written evidence. Each Party shall use the same level of care to prohibit disclosure of the Confidential Information and to prohibit the unauthorized use of the Confidential Information as the Party uses to protect its own confidential information of a similar nature, but in no event less than reasonable care. Neither Party will disclose the other Party's Confidential Information except to those employees and consultants who are directly participating in work on the Services and who have a need to know for the purpose of performing the Party's obligations or exercising its rights under this Agreement, provided that such employees and consultants are bound by written agreements respecting such Confidential Information in accordance with the terms of this Section. If a Party is required or ordered by any governmental agency, court, or tribunal of competent jurisdiction to make any disclosure of the other Party's Confidential Information, the receiving Party will first give written notice of such requirement to the disclosing Party, and will permit the disclosing Party to intervene in any relevant proceedings to protect its interests in the Confidential Information, and provide full cooperation to the disclosing Party in seeking to obtain such protection. Both Parties agree not to use Confidential Information for any purpose other than those purposes contemplated by this Agreement. Both Parties agree that these confidentiality and nondisclosure restrictions shall survive termination of this Agreement. For the avoidance of doubt, in the event of a conflict between this Section 12 and terms of any Rider, the provisions in the Rider shall prevail.

13. **Individually Identifying Data Confidentiality**. Any individually identifying data ("**Individually Identifying Data**") provided to Magenta, including but not limited to, donor and registrant names, patient names, donor or patient contact information, donor or patient identification numbers, sex, date of birth, gender, broad and detailed race category, and any other personally-identifying information shall be considered Confidential Information. Magenta is obligated to maintain Individually Identifying Data in compliance with all applicable federal and state statutes and regulations with regard to the use, disclosure, and safeguarding of Individually Identifying Data and records. At a minimum, Magenta shall have commensurate controls, with regard to its use, disclosure, and maintenance of Individually Identifying Data, to the Health Insurance Portability and Accountability Act of 1996, as amended, and the corresponding privacy and security regulations (45 CFR Parts 160 and 164). Individually Identifying Data may only be

used by Magenta for the express purposes outlined in this Agreement and may not be disclosed or distributed in any form to any individual or entity without prior written approval of BTMB. Improper use and disclosure of Individually Identifying Data is a material breach of this Agreement and will subject Magenta to contract damages and possible liability to third parties injured by Magenta's failure to comply with the requirements of this Section 13.

In the event of an Individually Identifying Data breach, Magenta shall: (i) provide BTMB with the name and contact information for an employee of Magenta who shall serve as BTMB's primary security contact [***]; (ii) notify BTMB of a Individually Identifying Data security breach as soon as practicable, but no later than [***] after Magenta becomes aware of it; and (iii) notify BTMB of any Individually Identifying Data security breaches by phone and e-mail via Magenta's primary business contact with BTMB. The notification obligation shall include, to the extent possible, the identification of each individual whose unsecured Individually Identifying Data has been, or is reasonably believed by Magenta to have been, accessed, acquired, used, or disclosed during the Individually Identifying Data security breach. Additionally, at least annually, Magenta shall conduct site audits of the information technology and information security controls for all facilities used in complying with its obligations under this Agreement, including, but not limited to, obtaining a network-level vulnerability assessment performed by a recognized third-party audit firm based on the recognized industry best practices. Magenta shall be liable for any and all liabilities and damages caused by its breach of the obligations set forth in this Section.

14. Miscellaneous.

(a) **Independent Contractors.** In the performance of duties and obligations under this Agreement, each Party and each of their employees, agents and contractors is an independent contractor, and not an employee or agent of the other. Neither Party shall have the right to control the time, manner or method of services provided by the other Party.

(b) **No Authority to Bind.** Neither Party has the authority to enter into contracts or agreements on behalf of the other Party or to otherwise legally bind the other Party.

(c) **Waiver.** The failure of any Party hereto at any time or times to require performance of any provision hereof shall in no manner affect the right of such Party at a later time to enforce the same. No waiver by any Party hereto of any condition, or of the breach of any provision, term, covenant, representation or warranty contained in this Agreement, whether by conduct or otherwise, in any one or more instances, shall be deemed to be or construed as a further or continuing waiver of any condition or of the breach of any other provision, term, covenant, representation or warranty of this Agreement.

(d) **Compliance with Federal Law.** To the extent any term of this Agreement is inconsistent with one or more provisions of any applicable federal law or regulation, the applicable provision of the federal law or regulation shall govern.

(e) **Assignment and Subcontract.** Neither Party may assign this Agreement or any of its respective rights and responsibilities under this Agreement, without the other Party's prior written consent. No responsibilities under this Agreement may be subcontracted without the prior written approval of the Parties, other than any subcontractors specifically described and agreed to by the Parties in the corresponding Rider(s).

(f) **Amendment.** This Agreement may only be modified or amended by a written document signed by an authorized representative of each of the Parties.

(g) **Governing Law, Venue, and Consent to Jurisdiction**. This Agreement, its terms and conditions, and all transactions contemplated by this Agreement shall be governed, construed and enforced in accordance with the laws of the State of Minnesota. The Parties agree that any action relating to or arising out of this Agreement shall only be brought in the federal and state courts of the State of Minnesota and consent to the exercise of personal jurisdiction by such courts over them.

(h) **Notice.** Any notice required to be given by this Agreement shall be in writing and sent to the Party's respective address first set forth above or to any other address as may be identified to the other Party in writing by: 1) United States mail, registered or certified, as evidenced by a delivery receipt; 2) with a private delivery service as evidenced by a shipping receipt; or 3) by electronic mail return receipt requested.

(i) **Severability.** Each provision of this Agreement is intended to be severable. If any provision is waived or deemed illegal or invalid for any reason, such waiver, illegality, or invalidity shall not affect the validity and enforceability of the remained of the Agreement.

(j) **Non-Solicitation of Employees or Consultants.** Each Party covenants and agrees that, during the term of this Agreement and for a period of [***] after the termination thereof for any reason, with or without cause, that it will not directly or indirectly, on its own behalf or on behalf of or in conjunction with any person or legal entity, recruit, solicit, or induce, or attempt to recruit, solicit, or induce, any employee of or consultant of the other Party to terminate his or her employment or other relationship with the other Party.

15. **Entire Agreement.** This Agreement, including its Attachments, constitutes the entire agreement between the Parties relating to the subject matter and supersedes all prior negotiations, agreements, communications, writings, understandings and representations between the Parties and with respect to this Agreement, including the MOU.

16. **Counterparts; Signatures.** This Agreement may be executed in any number of counterparts, each of which will be deemed to be an original and all of which together will constitute one and the same instrument. Facsimile or PDF signatures will have the same legal effect as original signatures.

This Agreement is executed by individuals who are duly authorized to enter into the Agreement and legally bind their respective Party:

BE THE MATCH BIOTHERAPIES		**MAGENTA THERAPEUTICS, INC.**	
By:	/s/ Brian Lindberg	By:	/s/ Christina Isacson
	(Authorized Signature)		(Authorized Signature)
	Brian Lindberg		Christina Isacson
	(Typed/Printed Name)		(Typed/Printed Name)
Title:	President	Title:	VP, Head of Business Development
Date:	December 6, 2017	Date:	November 10, 2017

ATTACHMENT A
PROJECT RIDER

This Rider ("**Rider**") is issued pursuant to the Collaboration Agreement ("**Agreement**"), effective November 10, 2017, between Be The Match BioTherapies ("**BTMB**") and Magenta Therapeutics, Inc. ("**Magenta**") and incorporates all of the terms and conditions therein. The effective date of this Rider shall be the date of the final signature executing this Rider.

POINT OF CONTACT

BTMB - 500 North 5th Street Minneapolis, MN 55401
- Business Development Department Contact: [***]

E-mail: [***]

Magenta - 50 Hampshire St, Cambridge, MA 02139
- Contact: [***] E-mail: [***]

BTMB and Magenta (each a "**Party**" and collectively the "**Parties**") agree as follows:

A. **STATEMENT OF WORK**. BTMB shall perform the following services ("**Services**"):

(a) Grant high priority access to subject matter experts at National Marrow Donor Program/Be The Match (NMDP/BTM), the Center for International Blood and Marrow Transplant Research (CIBMTR), including the Medical College of Wisconsin, and BTMB for discussion of Magenta's clinical development and commercialization needs (for example, for clinical expertise in transplant: Dr. Mary Horowitz, Dr. Linda Burns, Dr. Dennis Confer, and Dr. Bronwen Shaw; for HLA expertise: Dr. Caleb Kennedy, and Mr. Martin Maiers).

(b) Provide access to other departments in NMDP/BTM, CIBMTR, and BTMB that may provide expertise to Magenta in business areas not apparent today.

(c) CIBMTR will also grant Magenta a Corporate Leader Level membership.

B. **PROJECT CHANGES**. The Parties understand that in order to reflect changes to this Rider, the Rider will be subject to amendment by the Parties. Each party's respective Point Of Contact identified above may request or submit a written request for change to the other party's Point of Contact. The request for change should describe in appropriate detail the nature, extent and proposed manner of performance of the proposed change, related implications (if any) arising there from and estimated scheduling, pricing and cost information relating thereto. Written approval or rejection of the requested change signed by an authorized representative of Magenta will be provided within [***] from the date of receipt.

C. **PERMITTED SUBCONTRACTORS**. Magenta acknowledges and agrees that BTMB may subcontract with the Medical College of Wisconsin in order to fulfil its obligations under this Agreement and corresponding Rider. BTMB shall ensure that MCW complies will all relevant terms of this Agreement.

D. **COMPENSATION OF BTMB**.

BTMB shall be compensated in accordance with the payment schedule set forth below.

PAYMENT SCHEDULE

[***] [***]

[***] [***]

[***]

Invoice. BTMB may use its own invoice format referencing this Agreement. All NMDP invoices shall be sent to Magenta via email to [***]. Except as otherwise provided herein, all invoiced amounts not subject to a good faith dispute are due and payable within [***]from Magenta's receipt of the invoice. Payments shall be sent to the attention of NMDP Accounts Receivable at 500 N 5th St, Minneapolis, MN 55401-1206 or ardepart@nmdp.org.

E. **TERM**. The term of this Rider shall commence on the Rider effective date set forth above and continue and remain in effect through [***] from the Rider effective date.

This Rider must be signed by individuals authorized to legally bind their respective Parties.

BE THE MATCH BIOTHERAPIES		**MAGENTA THERAPEUTICS, INC.**	
By:	_____	By:	_____
	(Authorized Signature)		(Authorized Signature)
	_____		_____
	(Typed/Printed Name)		(Typed/Printed Name)
Title:	_____	Title:	_____
Date:	_____	Date:	_____

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

CLINICAL TRIAL AGREEMENT

This Clinical Trial Agreement (including any exhibits or appendices attached hereto, this "Agreement") is made as of the date of last signature below (the "Effective Date") by and between Regents of the University of Minnesota, a non-profit, educational, research and healthcare institution ("Institution") with an address at 450 McNamara Alumni Center, 200 Oak Street SE, Minneapolis, MN 55455, and Magenta Therapeutics, Inc., a corporation having its principal place of business at 50 Hampshire Street, Cambridge, MA 02139 ("Sponsor"). Sponsor and Institution are herein referred to collectively as "Parties." Individually, each of Sponsor and Institution is a "Party."

WHEREAS, Sponsor is a for-profit organization that intends to conduct a sponsored multicenter clinical trial, described in 1.1 below, involving the use of certain diagnostic(s), drug(s), device(s), or biologic(s) provided by Sponsor;

WHEREAS, Cmed Inc. ("CRO") is acting as clinical trial manager on behalf of Sponsor for the Study (as defined below);

WHEREAS, the Institution has appropriate facilities and personnel with the qualification, training, knowledge, and experience necessary to conduct such a clinical trial; and

WHEREAS, the Study contemplated by this Agreement is of mutual interest and benefit to Institution and Sponsor, and will further the instructional and research objectives of Institution in a manner consistent with its status as a nonprofit educational, research and health care institution;

NOW, THEREFORE, in consideration for the mutual promises made in this Agreement and for valid consideration, the Parties agree as follows:

1. Scope of Agreement

1.1 Institution will undertake a sponsored multicenter clinical trial ("Study") described in the protocol entitled, "A Phase 2, Single-arm, Open-label Study to Evaluate the Safety and Efficacy of MGTA-456 in Patients with Inherited Metabolic Disorders (IMD) Undergoing Hematopoietic Stem Cell (HSC) Transplantation (HSCT)" which is attached hereto and incorporated herein as **Exhibit A** ("Protocol"). Institution will only recruit subjects who conform to the Protocol's inclusion and exclusion criteria and do not require serious deviations from the Protocol. The Study will be conducted at the Institution under the direction of Dr. Paul Orchard, an employee of Institution ("Principal Investigator") in accordance with this Agreement and the Protocol. Principal Investigator will be responsible for the direction of the Study in accordance with applicable Institution policies, which Institution represents and certifies are not inconsistent with the terms of this Agreement or the Protocol. If, for any reason, he/she is unable to continue to serve as Principal Investigator and a successor acceptable to Institution and Sponsor is not available, this Agreement shall be terminated as provided in the termination section below. If Institution finds a replacement acceptable to Sponsor, this Agreement will be amended to add the new investigator as a signatory. Institution represents and certifies that Principal Investigator is fully qualified to conduct the Study and to serve in the capacity of Principal Investigator.

1.2 In the event of any conflict between the terms and conditions of this Agreement and the Protocol or between the body of this Agreement and any of its Exhibits or Appendices (including the Supply Agreement and Quality Agreement), the terms and conditions of the Protocol shall control with respect to matters of the clinical conduct of the Study, the terms of the Supply Agreement shall control with respect to the manufacture and supply of the Study Drug (as defined below), and the terms of this Agreement shall control with respect to all other matters.

1.3 Unless otherwise agreed to by the Parties, Institution will manufacture and supply the required quantities of properly-labeled MGTA-456 (the "Study Drug") in accordance with that certain Manufacturing and Supply Agreement between the Parties, dated as of the date hereof and attached hereto as Appendix A (the "Supply Agreement"), and that certain Quality Assurance Agreement between the Parties referenced therein (the "Quality Agreement"). Sponsor shall have the right, in its sole discretion, to terminate the Supply Agreement upon written notice to Institution. In the event of a termination of the Supply Agreement, [***]. Any termination of the Supply Agreement will have no other effect on the rights or obligations of the Parties under this Agreement. Sponsor has provided and may after the Effective Date provide to Institution other materials (e.g., Investigator's Brochure, handling and storage instructions, and, if applicable, placebo) necessary for Institution to conduct the Study in accordance with the Protocol. Unless stated otherwise in writing by Sponsor, all such materials are and will remain the sole property of Sponsor until administered or dispensed to Study subjects during the course of the Study. Receipt, storage, and handling of Study Drug and such other materials will be in compliance with all applicable laws and regulations, the Protocol, Sponsor instructions and this Agreement.

1.4 Sponsor and Institution shall comply with and conduct all aspects of the Study in compliance with all applicable federal, state, and local laws and regulations, including generally accepted standards of good clinical practice as adopted by current FDA regulations and statutes and regulations of the U.S. Government relating to exportation of technical data, computer software, laboratory prototypes, and other commodities as applicable to academic institutions. Institution will only allow individuals who are appropriately trained and qualified, and are either (a) employees subject to Institution policies and the terms of this Agreement, or (b) subcontractors of Institution subject to written obligations to Institution under which they are bound to (i) obligations of confidentiality and non-use with respect to Confidential Information that are consistent with the terms of this Agreement and (ii) assign and otherwise effectively vest in Institution any and all rights that such individual might otherwise have in the results of their work as required for Institution to fulfill its obligations to Sponsor under this Agreement (such individuals, "Study Personnel"), to participate in the conduct of the Study or the manufacture and supply of the Study Drug. Institution shall be responsible for all Study Personnel's compliance with the terms of this Agreement.

1.5 Institution shall obtain institutional review board ("IRB") approval for this Study and proof thereof shall be provided to Sponsor. Initiation of the Protocol and Institution's obligation to conduct the Study shall not begin until IRB approval is obtained. Institution shall obtain from each subject, prior to the subject's participation in the Study, a signed informed consent and necessary authorization to disclose health information to Sponsor in a form approved in writing by the IRB and Sponsor or a waiver of consent as directed by the IRB and further provided that the informed consent is consistent with Institution's policies.

1.6 Sponsor agrees to provide Institution with any data and safety monitoring reports related to the Study, and Institution agrees they will be promptly submitted to the IRB as required. During the Study and for at least [***] years following the completion of the Study, Sponsor shall promptly provide Institution and Principal Investigator with the written report of any findings, including Study results and any routine monitoring findings in site monitoring reports, and data safety monitoring committee reports including, but not limited to, data and safety analyses, and any Study information that may (i) affect the safety and welfare of current or former Study subjects, or (ii) influence the conduct of the Study. Institution and/or Principal Investigator will communicate findings to the IRB and Study subjects, as appropriate.

1.7 Institution shall promptly inform Sponsor of any urgent safety measures as instructed in the Protocol or breaches of the Protocol of which Institution becomes aware.

1.8 Institution hereby acknowledges that CRO is acting as clinical trial manager on behalf of Sponsor to manager and administer the Study. As such Institution acknowledges and agrees that CRO may satisfy certain of Sponsor's obligations or exercise certain of Sponsor's rights hereunder.

2. Payments

Sponsor or its designee agrees to pay Institution the fees in accordance with the budget attached as **Exhibit B** ("Budget") on a prorated basis, in accordance with the agreed upon schedule according to the actual work completed and any non-cancelable obligated expenses, for subjects who are enrolled into the Study. Institution and Principal Investigator will accept payment from Sponsor or its designee as full consideration for services rendered. It is understood and agreed that no reimbursement will be provided by Sponsor for subjects who are enrolled in the Study in violation of the Protocol, or who do not conform to the Protocol's inclusion and exclusion criteria or for whom serious deviations from the Protocol are made (except to the extent such deviations are necessary to protect the safety or welfare of the Study Subjects). The Parties acknowledge that the Budget amounts represent an equitable exchange for the conduct of the Study in light of the professional time and expenses required for the performance of the Study.

In addition to other necessary routing information detailed in Exhibit B, each payment shall clearly reference the: Study Protocol Number and PI name.

For administrative convenience, various Study contact information may be attached hereto and incorporated by reference as Exhibit C, entitled, "Administrative & Study Points of Contact."

The Institution's tax identification number is: [***].

3. Confidentiality

3.1 It is anticipated that in the performance of this Agreement, Sponsor or CRO may disclose to Institution information which is considered confidential. The rights and obligations of the Parties with respect to such information are as follows:

"Confidential Information" refers to information of any kind which is: (i) disclosed to the Institution, Principal Investigator or Personnel by or on behalf of Sponsor for purposes of conducting the Study, which:

a) by appropriate marking, is identified as confidential and proprietary at the time of disclosure, or

b) if disclosed orally, is identified in a marked writing within [***] days as being confidential; or

(ii) developed or generated by Institution, Principal Investigator or Study Personnel as a result of performing the Study under this Agreement (except for a Study subject's medical records), including but not limited to, the Protocol and Data (as defined below in Section 4).

With respect to subsection (i) above, Sponsor will make reasonable efforts to mark such Confidential Information as stated in (i)(a) and (b) above. However, to the extent such marking is not practicable, then in the absence of written markings, information disclosed (written or verbal) that a reasonable person familiar with the Study would consider it to be confidential or proprietary from the context or circumstances of disclosure shall be deemed as such.

Notwithstanding subsection (ii) above, Institution will have the right to publish, present or use any Data and results generated in the course of conducting the Study in accordance with Section 9 of this Agreement Confidential Information and all tangible expressions, in any media, of Confidential Information are the sole property of Sponsor.

During the term of this Agreement and for a period of [***] years following the termination or expiration of this Agreement, Institution agrees to, and shall cause each Study Personnel to, (a) use Sponsor's Confidential Information solely for the purposes of conducting the Study as allowed by this Agreement and (b) maintain Sponsor's Confidential Information in confidence and to make Sponsor's Confidential Information available only to those of its, or its affiliated hospitals' employees, personnel, agents, consultants, and vendors, and approved subcontractors, as applicable, who require access to it in the performance of this Study, and are subject to similar terms of confidentiality. Institution shall safeguard Confidential Information with the same standard of care that is used with Institution's Confidential Information, but in no event less than reasonable care.

3.2 The obligation of nondisclosure does not apply with respect to any of the Confidential Information that:

a) is or becomes public knowledge through no breach of this Agreement by Institution;

b) is disclosed to Institution by a third party entitled to disclose such information without known obligation of confidentiality;

c) is already known or is independently developed by Institution without use of Sponsor's Confidential Information as shown by Institution's contemporaneous written records;

d) is released with the prior written consent of the Sponsor; or

e) is required to support the medical care of a Study Subject.

3.3 Institution may disclose Confidential Information to the extent that it is required to be produced pursuant to a requirement of applicable law, government agency, an order of a court of competent jurisdiction, or a facially valid administrative, Congressional, or other subpoena, provided that Institution, subject to the requirement, order, or subpoena, promptly notifies Sponsor. To the extent allowed under applicable law, Sponsor may seek to limit the scope of such disclosure and/or seek to obtain a protective order (and Institution will reasonably assist Sponsor in such efforts). Institution will disclose only the minimum amount of Confidential Information necessary to comply with law or court order as advised by Institution's legal counsel.

3.4 No license or other right is created or granted hereby, except the specific right to conduct the Study as set forth by Protocol and under terms of this Agreement, nor shall any license or other right with respect to the subject matter hereof be created or granted except by the prior written agreement of the Parties duly signed by their authorized representatives.

3.5 Upon Sponsor's written request, Institution shall return all Confidential Information in its or each Study Personnel's possession at Sponsor's expense (for any out-of-pocket, reasonable and pre-approved costs incurred by Institution) pursuant to this Agreement except that Institution may retain (i) one (1) archival copy of any such Confidential Information in a secure location for purposes of identifying and satisfying its obligations and exercising its rights under this Agreement and (ii) copies of the Data and results for the purposes set forth in Sections 4, 8.4 and 9 of this Agreement.

3.6 Each of Sponsor and Institution may disclose the existence of this Agreement and any additional information necessary to ensure compliance with applicable Federal, State and Institutional policies, regulations, and laws.

4. Data Use/Ownership

"Data" shall mean all data and information generated by Institution or Study Personnel as a result of conducting the Study. Data does not include original Study subject or patient medical records, research notebooks, source documents, or other routine internal documents kept in the Institution's ordinary course of business operations, which shall remain the sole and exclusive property of the Institution. Sponsor shall own all Data and have the right to use all Data in accordance with the signed informed consent and authorization form, applicable laws, and the terms of this Agreement and Institution hereby assigns, and agrees to assign, to Sponsor all right, title and interest in and to all Data and progress reports created specifically for Sponsor in the performance of the Study. Notwithstanding any licenses or other rights granted to Sponsor herein, but in accordance with Sections 3 and 9 herein, Institution shall retain the right to use the Data and results for its publication, IRB, regulatory, legal, educational, and internal research purposes. Institution shall promptly disclose to Sponsor any and all Data as it is generated.

5. HIPAA/HIPAA Privacy

5.1 Institution shall comply with applicable laws and regulations, as amended from time to time, including without limitation, the Health Insurance Portability and Accountability Act of 1996 and its implementing regulations (HIPAA) with respect to the collection, use, storage, and disclosure of Protected Health Information (PHI) as defined in HIPAA. Sponsor shall collect, use, store, access, and disclose PHI collected from Study subjects only as permitted by the IRB approved informed consent form or HIPAA authorization form obtained from a Study subject. Sponsor will collect, use, store, and disclose any Subject Material, defined in Section 15, it receives only in accordance with the informed consent form and, in any event, will not collect, use, store, or disclose any PHI attached to or contained within the Subject Material in any manner that would violate this Section of the Agreement.

Institution acknowledges that, pursuant to Section 111 of the Medicare, Medicaid, and SCHIP Extension Act of 2007 ("MMSEA"), Sponsor has an obligation to submit certain reports to the Centers for Medicare & Medicaid Services with respect to Medicare beneficiaries who participate in the Study and experience a research injury for which diagnosis or treatment costs are incurred. Sponsor recognizes that Institution and Sponsor are subject to laws and regulations protecting the confidentiality of research subject information. Accordingly: (1) Institution agrees upon prior written request to provide to Sponsor, or a third-party vendor as designated by Sponsor, certain identifiable patient information required by MMSEA for Study subjects who are Medicare beneficiaries and incur medical costs in association with a research injury and whose costs are reimbursed by Sponsor pursuant to this Agreement; and (2) Institution further agrees to otherwise cooperate with Sponsor (and any third-party vendors as designated by Sponsor) to the extent necessary for Sponsor to meet its MMSEA reporting obligations.

5.2 Sponsor's ability to review the Study subjects' Study-related information contained in the Study subject's medical record shall be subject to reasonable safeguards for the protection of Study subject confidentiality and the Study subjects' informed consent form or HIPAA authorization form.

5.3 Sponsor shall not attempt to identify, or contact, any Study subject unless permitted by the informed consent form.

6. Record Retention

As applicable by law, Institution shall retain and preserve a copy of the Study records for the longer of:

a) [***] after a marketing authorization for Study Drug has been approved for the indication for which it was investigated or Sponsor has discontinued research on the Study Drug;

b) such longer period as required by federal regulatory requirements; or

c) as requested by Sponsor at Sponsor's reasonable storage expense.

At the end of such required retention period, Institution shall not destroy any such records until it has provided Sponsor with [***] days prior written notice. Sponsor will respond promptly to Institution's notice of disposal of records.

7. Monitoring and Auditing

7.1 Site visits by Sponsor and/or its authorized designee (e.g., Study monitor or CRO) will be scheduled in advance for times mutually acceptable to the Parties during normal business hours. Sponsor's and/or authorized designee's access is subject to reasonable safeguards to ensure confidentiality of medical records and systems. Principal Investigator and appropriate Study Personnel will be available during normal business hours and at mutually agreeable times to discuss or review Data and to resolve any questions related to such data. The representatives of CRO or Sponsor may review and/or request copies of the Data, and Institution shall promptly provide full access to such Data.

7.2 Upon becoming aware of an audit or investigation by a regulatory agency with jurisdiction over the Study (e.g., IRB, DBA), Institution agrees to provide Sponsor with prompt, but in no event later than five (5) calendar days, written notice of the auditor investigation. Institution and Principal Investigator agree to cooperate with the regulatory agency, comply with legitimate requirements of the audit, and make appropriate Study Personnel available to explain and discuss records and documentation related to the Study. If legally permissible or allowable by the regulatory agency, Sponsor or its designee shall have the right to be present with approval from auditor during such audit, but Sponsor agrees not to alter or interfere with any documentation or practice of Institution. Sponsor shall have the opportunity to review and comment on any responses to any regulatory agency inquiries and Institution will provide Sponsor with a copy of any all materials, correspondence, statements, forms and records which Institution receives or obtains from any regulatory agency regarding the Study.

8. Inventions, Discoveries and Patents

8.1 It is recognized and understood that certain existing inventions and technologies, and those arising outside of this Agreement, are the separate property of Sponsor or Institution, as applicable, and are not affected by this Agreement, and neither Party shall have any claims to or rights in such separate inventions and technologies.

8.2 Any new patentable inventions, developments, or discoveries created or reduced to practice in the performance of the Study made by Institution, Principal Investigator and/or Study Personnel ("Inventions") shall be promptly disclosed, in writing, to Sponsor. Title to Inventions that necessarily use or incorporate Sponsor's Study Drug shall reside with Sponsor ("Sponsor Inventions"). Institution hereby assigns, and agrees to assign, to Sponsor all right, title and interest in and to Sponsor Inventions. Title to Inventions other than Sponsor Inventions ("Other Inventions") shall reside with Sponsor if Sponsor personnel are the sole inventors, with Institution if Institution personnel are the sole inventors, and shall be held jointly if both Institution and Sponsor personnel are inventors.

8.3 To the extent that Institution owns sole or joint title in any such Other Inventions, Institution hereby grants to Sponsor a perpetual, irrevocable, royalty-free, non-exclusive, non-sublicensable (except to employees, contractors and consultants performing services on behalf of Sponsor) license to use the Other Inventions solely for Sponsor's internal research and development purposes. Further, Sponsor is hereby granted, without option fee other than consideration of the Study sponsored herein and the reimbursement to Institution for patent

expenses incurred prior to or during the option period, an option to acquire an exclusive, worldwide, royalty-bearing license to Institution's rights to any Other Invention, which option shall extend for no more than [***] days after Sponsor's receipt of an Invention disclosure from Institution ("Option Period"). The Parties shall use their reasonable efforts to negotiate, for a period not to exceed [***] days after Sponsor's exercise of such option, a license agreement satisfactory to both Parties ("Negotiation Period"). In the event Sponsor fails to exercise its option within the Option Period, or the Parties fail to reach agreement on the terms of such license within the Negotiation Period, Institution shall have no further obligation to Sponsor under this Agreement with regard to the specific Other Invention.

8.4 Institution shall retain a royalty-free, irrevocable license to use for its own internal noncommercial research, educational and patient care purposes, all Sponsor Inventions or Other Inventions licensed or assigned to Sponsor hereunder.

8.5 Nothing contained in this Agreement shall be deemed to grant either directly by implication, estoppel, or otherwise any license under any patents, patent applications, or other proprietary interest to any other inventions, discovery or improvement of either Party.

8.6 The Parties agree that the provisions of this Agreement are intended to be interpreted and implemented so as to comply with all applicable federal laws, rules, and regulations, including without limitation the requirements of Rev. Proc. 2007-47; provided, however, if it is determined by the Internal Revenue Service or any other federal agency or instrumentality (the "Government") that the provisions of this Agreement are not in such compliance, then the Parties agree to modify the provisions and the implementation of this Agreement so as to be in compliance with all applicable federal laws, rules, and regulations as determined by the Government.

9. Publication

9.1 Institution may publish, present, or use any Data and results arising out of its performance of the Protocol (individually, a "Publication") in compliance with this Section and with Section 3 (Confidentiality). At least [***] days prior to submission for Publication, Institution and Principal Investigator shall submit to Sponsor for review and comment any proposed oral or written Publication ("Review Period"). [***]. The Review Period for abstracts or poster presentations shall be [***] days. If [***] the Publication contains Sponsor's Confidential Information as defined in Section 3 and Sponsor requests Institution in writing to delete such Sponsor's Confidential Information (excluding Data), the Institution agrees to delete such Sponsor's Confidential Information (excluding Data).

9.2 Intentionally Omitted.

9.3 Intentionally Omitted.

9.4 Intentionally Omitted.

10. Use of Name

10.1 Neither Institution nor Sponsor may use the name, trademark, logo, symbol, or other image or trade name of the other Party or its employees and agents in any advertisement, promotion, or other form of publicity or news release or that in any way implies endorsement without the prior written consent of an authorized representative of the other Party whose name is being used. Such approval will not be unreasonably withheld or delayed.

10.2 Each Party understands that the amount of any payment made hereunder may be disclosed and made public by the other Party as required by law or regulation, including the Patient Protection and Affordable Care Act of 2010, provided that the disclosure clearly designates the payment as having been made to Institution for research and not to the physician.

10.3 Institution may acknowledge the Sponsor's support, including but not limited to financial support as may be required by academic journals, professional societies, funding agencies, and applicable regulations. Notwithstanding anything to the contrary in this Agreement, Institution may publicly post information about the Study to appear on Institution's clinical trials directory/website. Additionally, notwithstanding anything herein to the contrary, Institution shall have the right to post Sponsor's name, the Study title, and the Study period, and funding amount, on Institution publicly accessible lists of research conducted by the Institution.

11. Indemnification and Limitation of Liability

11.1 Sponsor agrees to defend, indemnify, and hold harmless the Institution and its medical affiliates and affiliated hospitals, the Study Personnel, Principal Investigator and each of their trustees, officers, directors, governing bodies, subsidiaries, affiliates, investigators, employees, IRB members, agents, successors, heirs and assigns (collectively referred to as "Institution's Indemnitees"), from and against any third party claims, loss, damage, cost and expense of claims (including reasonable attorney's fees) and suits ("Claims") alleged to be caused by or arising from (a) the conduct of the Study, (b) Institution's use of the Study Drug in accordance with this Agreement, (c) Sponsor's or any third party's use of the Study results or Study Drug, or (d) the conduct of the Study at any other site, regardless of the legal theory asserted.

11.2 Sponsor shall have no obligation to provide such indemnification to the extent that such Claim is caused by or directly results from an Institution's Indemnitee(s)': (1) failure to adhere to and comply with all material and substantive specifications and directions set forth in the Protocol (except to the extent such deviation is reasonable to protect the rights, safety and welfare of the Study subjects); (2) failure to comply with all applicable laws and regulations in the performance of the Study, (3) willful misconduct, negligent acts or omissions or (4) breach of this Agreement.

11.3 Subject to the limits and without waiving any immunities provided under applicable law (including constitutional provisions, statutes and case law) regarding the status, powers and authority of the Institution or the Institution's principal (s), Institution shall indemnify, hold harmless and defend Sponsor, CRO, its directors, officers, employees and agents, ("Sponsor's Indemnitees") from and against third party Claims to the extent directly caused by or resulting from an Institution Indemnitee's willful misconduct or negligence in connection with the conduct of the Study. Notwithstanding the above, Institution shall have no obligation to indemnify Sponsor for any other Claims (including, but not limited to, infringement or product liability Claims).

11.4 The indemnified Party shall give notice to the indemnifying Party promptly upon receipt of written notice of a Claim for which indemnification may be sought under this Agreement, provided, however, that failure to provide such notice shall not relieve indemnifying Party of its indemnification obligations except to the extent that the indemnifying Party's ability to defend such Claim is materially, adversely affected by such failure. The indemnifying Party shall not make any settlement admitting fault or incur any liability on the part of the indemnified Party without indemnified Party's prior written consent, such consent not to be unreasonably withheld, conditioned or delayed. The indemnified Party shall cooperate with indemnifying Party in all reasonable respects regarding the defense of any such Claim, at indemnifying Party's expense. The indemnified Party shall be entitled to retain counsel of its choice at its own expense. In the event a Claim falls under this indemnification clause, in no event shall the indemnified Party compromise, settle or otherwise admit any liability with respect to any Claim without the prior written consent of the indemnifying Party, and such consent not to be unreasonably withheld or delayed.

11.5 EXCEPT FOR LIABILITY ARISING OUT OF A PARTY'S INDEMNIFICATION OBLIGATIONS IN THIS SECTION 11, NEITHER PARTY SHALL BE LIABLE FOR SPECIAL, CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT, EVEN IF ADVISED OF THE POSSIBILITY OF THE SAME.

12. Subject Injury

If a Study subject suffers an adverse reaction, illness, or injury which, in the reasonable judgment of Institution, was directly caused by a Study Drug administered in accordance with this Agreement and the Protocol or any properly performed procedures required by the Protocol, Sponsor shall provide reimbursement for the reasonable and necessary medical costs of diagnosis and medical treatment of any Study subject injury, including hospitalization, but only to the extent such expenses are not attributable to (I) Institution's negligence or willful misconduct, (ii) Institution's breach of this Agreement or (iii) the natural progression of an underlying or pre-existing condition or events, unless exacerbated by participating in the Study.

13. Insurance

13.1 For the term of this Agreement and two (2) years thereafter, Institution shall, at its sole cost and expense maintain a policy or program of general liability insurance and clinical trial insurance or self-insurance at the level of at least $[***] per occurrence (or per claim) and $[***] annual aggregate to support its obligations assumed in this Agreement. However, if Institution is a public entity entitled to governmental immunity protections under applicable state law, then Institution may provide liability coverage in accordance with any limitations associated with the applicable law.

13.2 Sponsor shall, at its sole cost and expense, procure and maintain commercial general liability insurance, clinical trial insurance and products liability insurance or equivalent self-insurance, unless otherwise indicated in an attached work order, in amounts not less than $[***] per occurrence and $[***] annual aggregate. [***].

13.3 Upon written request, either Party will provide evidence of its insurance or self-insurance acceptable to the other Party. Either Party will provide the other Party with written notice of material change in its coverage which would affect such Party's ability to meet its obligations under this Agreement. A Party's inability to meet its insurance obligation constitutes material breach of this Agreement.

14. Term and Termination

14.1 This term of this Agreement shall commence upon the Effective Date and terminate upon the completion of the Study, unless terminated early as further described in this Section.

14.2 Sponsor has the right to terminate the Study for any reason upon [***] days prior written notice to the Institution. The Study may be terminated immediately at any time for any reason by the Institution or Sponsor when, in their judgment or that of the Principal Investigator, the Institution's IRB, or the Food and Drug Administration, it is determined to be inappropriate, impractical, or inadvisable to continue, in order to protect the Study subjects' rights, welfare, and safety, or the IRB otherwise disapproves the Study. If for any reason Principal Investigator becomes unavailable to direct the performance of the work under this Agreement, Institution shall notify Sponsor. If the Parties are unable to identify a mutually acceptable successor, this Agreement may be terminated by either Party upon [***] days written notice.

14.3 Notwithstanding the above, any Party may, in addition to any other available remedies:

a) immediately terminate this Agreement upon the other Party's material failure to adhere to the Protocol, except for reasonable deviations required to protect the rights, safety, and welfare of Study subjects; and/or

b) terminate this Agreement upon the other Party's material default or breach of this Agreement, provided that the defaulting/breaching Party fails to remedy such material default or breach, as applicable, within [***] days after written notice thereof.

14.4 In the event that this Agreement is terminated prior to completion of the Study, for any reason, Institution shall:

a) notify the IRB that the Study has been terminated;

b) immediately cease enrolling subjects in the Study;

c) immediately cease administering the Study Drug to Study subjects and treating Study subjects under the Protocol as directed by Sponsor to the extent medically permissible and appropriate;

d) terminate, as soon as practicable, all other Study activities; and

e) furnish to Sponsor any required final report for the Study in the form reasonably acceptable to Sponsor.

Promptly following any such termination, Institution will provide to Sponsor all Data. Upon Sponsor's written request, Institution shall provide to Sponsor all Sponsor's Confidential Information provided under this Agreement provided, however, that Institution may retain one (1) archival copy of such Confidential Information for record keeping purposes in a secure location for the purpose of identifying and satisfying its obligations, and exercising its rights hereunder, subject to Institution's ongoing compliance with the confidentiality and non-use obligations set forth in this Agreement.

14.5 If this Study is terminated early by either Party, the Institution shall be reimbursed for all work completed, on a pro rata basis, and reasonable out-of-pocket costs of bringing the Study to termination incurred through the date of termination, and for non-cancelable commitments properly incurred through that date. Upon receipt of notice of termination, Institution will use reasonable efforts to reduce or eliminate further costs and expenses and will cooperate with Sponsor to provide for an orderly wind-down of the Study.

14.6 Subsections 1.4, 1.6, and 14.6, and Sections 2 (solely to the extent there are any payments due and payable), 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 19, 23 and 24, shall survive any termination or expiration of this Agreement, except that Section 3 shall survive for the period stated in Section 3.1. Any provision of this Agreement that by its nature and intent remains valid after termination will survive termination.

15. Subject Material

15.1 Subject Material means any biologic material of human origin including, without limitation, tissues, blood, plasma, urine, spinal fluid, or other fluids derived from the Study subjects in accordance with and pursuant to the Protocol ("Subject Material").

15.2 Institution agrees to make the Subject Material available to the Sponsor in accordance with the Protocol for the purposes of the Study. The Subject Material may be used by the Sponsor, central lab, or other contracted party only as allowed by the Study subject's informed consent form or pertinent institutional review board(s). Sponsor agrees that any use of Subject Materials, other than as allowed by the Study subject's informed consent form, will require additional IRB review and approval.

16. Intentionally Omitted

17. Notices

Any notice, authorization, approval, consent or other communication will be in writing and deemed given:
a. Upon delivery in person;
b. Upon delivery by courier;
c. Upon delivery date by a nationally-recognized overnight delivery service such as FedEx.

If to Sponsor:
Magenta Therapeutics, Inc.
[***]
50 Hampshire Street, 8th Floor
Cambridge, MA 02139
[***]

If to Institution:
University of Minnesota
[***]
450 McNamara Alumni Center
200 Oak Street SE
Minneapolis, MN 55455
[***]

With a copy to Principal Investigator:
Dr. Paul Orchard
[***]

18. Independent Contractor

It is mutually understood and agreed that the relationship between the Parties is that of independent contractors. Neither Party shall represent itself as the agent, employee, partner, joint venturer, or servant of the other. Except as specifically set forth herein, neither Party shall have nor exercise any control or direction over the methods by which the other Party performs work or obligations under this Agreement. Further, nothing in this Agreement is intended to create any partnership, joint ventures, lease, or equity relationship, expressly or by implication, between the Parties.

19. Clinical Trial Registry

Prior to enrollment of the first subject in the Study, Sponsor agrees to ensure that the Study is fully registered on www.clinicaltrials.gov in accordance with the requirements of the International Committee of Medical Journal Editors (ICMJE) and Public Law 110-85. Results of this Study will be reported in compliance with applicable laws.

20. Non-Referral/Anti-Corruption Language

20.1 The Parties agree that it is not their intent under this Agreement to induce or encourage the unlawful referral of subjects or business between the Parties, and there shall not be any requirement under this Agreement that either Party, its employees or affiliates, including its medical staff, engage in any unlawful referral of subjects to, or order or purchase products or services from, the other Party.

20.2 Each Party shall require that their employees, who are involved in the conduct of the Study, will not offer, pay, request or accept any bribe, inducement, kickback or facilitation payment, and shall not make or cause another to make any offer or payment to any individual or entity for the purpose of influencing a decision for the benefit of the other Party.

21. Force Majeure

If either Party hereto shall be delayed or hindered in, or prevented from, the performance of any act required hereunder for any reason beyond such Party's direct control, including but not limited to, strike, lockouts, labor troubles, governmental or judicial actions or orders, riots, insurrections, war, acts of God, inclement weather, or other reason beyond the Party's control (a "Disability") then such Party's performance shall be excused for the period of the Disability. Any Study timelines affected by a Disability shall be extended for a period equal to the delay. The Party affected by the Disability shall notify the other Party of such Disability as provided for herein.

22. Counterparts

This Agreement may be executed in any number of counterparts, each of which shall be an original and all of which together shall constitute one and the same document, and is binding on all Parties notwithstanding that each of the Parties may have signed different counterparts. Facsimiles or scanned copies of signatures or electronic images of signatures shall be considered original signature unless prohibited by applicable law.

23. Debarment

The Institution certifies that to its knowledge neither it, nor any of the Study Personnel, including the Principal Investigator, is currently debarred, suspended, or excluded under the Federal Food, Drug and Cosmetic Act, as amended, or disqualified under the provisions of 21 CFR §312.70. In the event that the Principal Investigator or any Study Personnel becomes debarred or disqualified during the term of this Agreement or within 1 year after termination of the Study, the Institution agrees to promptly notify Sponsor after learning of such event. Institution certifies that it is not excluded from a federal health care program, including Medicare and Medicaid. In the event an Institution becomes excluded during the term of this Agreement or within 1 year after termination of the Study, the Institution agrees to promptly notify Sponsor after learning of such event.

24. Choice of Law and Assignment

This Agreement shall be governed by and construed with the laws of the State of Minnesota.

This Agreement shall be binding upon and for the benefit of the Parties hereto, and their successors and permitted assigns. This Agreement, and all rights, duties and obligations hereunder, may not be assigned or delegated by Institution without the prior express written consent of Sponsor. Any attempt made by Institution to assign or delegate this Agreement in violation of this section shall be of no force or effect. Institution acknowledges that Sponsor has the right to assign or delegate its interest in this Agreement or any portion thereof without the consent of Institution. Sponsor shall provide prompt notice of such assignment to University.

25. Entire Agreement

Section and clause headings are used herein solely for convenience of reference and are not intended as substantive parts of the Parties' agreement This Agreement incorporates the Exhibits and Appendices referenced herein. This Agreement constitutes the entire agreement between the Parties concerning the subject matter, and supersedes all other or prior agreements or understandings, whether written or oral, with respect to that subject matter. Any changes made to the terms, conditions or amounts cited in this Agreement require the written approval of each Party's authorized representative.

[*Remainder of page intentionally blank. Signatures begin on next page*]

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

The authorized representatives of the Parties have signed this Agreement as set forth below.

REGENTS OF THE UNIVERSITY OF MINNESOTA	MAGENTA THERAPEUTICS, INC.
By: /s/ Laura Williams {NAME}	By: /s/ Christina Isacson {NAME}
Title: Principal Grants and Contracts Admin, Sponsored Projects Administration	Title: Chief Business Officer
Date: 1/19/2018	Date: 1/19/2018

READ AND ACKNOWLEDGED

By: _____
PRINCIPAL INVESTIGATOR

Title: Professor of Pediatrics. Blood and Marrow Transplantation
Date: 1/19/2018

Exhibit A

Protocol

Study IMD-001 (Amendment v03) 07/September/2017

Magenta Therapeutics
MGTA-456

CLINICAL TRIAL PROTOCOL IMD-001

A Phase 2, Single-arm, Open-label, Study to Evaluate the Safety and Efficacy of MGTA-456 in Patients with Inherited Metabolic Disorders (IMD) Undergoing Hematopoietic Stem Cell (HSC) Transplantation (HSCT)

Sponsor:	**Magenta Therapeutics, Inc. (Mageata)**
Document Type:	**Amended Protocol**
IND Number:	**16729**
Version:	**03**
Development Phase:	**2**
Document Status:	**Final**
Date:	**07 September 2017**

CONFIDENTIAL

May not be used, divulged, published or otherwise disclosed without the consent of Magenta

Exhibit B
Clinical Trial Budget and Payment Terms

Study Budget

In consideration for conducting the Study, the Sponsor shall pay Institution for all services required under the Study pursuant to the attached agreed upon Budget.

Costs and Payment

1. Payment shall be made to the Institution in accordance with the Payment Schedule below.
2. Each check will be made payable to Regents of the University of Minnesota, will reference the Protocol number and will be mailed to University of Minnesota, Sponsored Financial Reporting, NW 5957, PO Box 1450, Minneapolis, MN 55485-5957. The Institution's Tax Identification Number is Federal Tax ID# [***].

Payment Schedule:

Upon Contract Execution

An initial advance payment of $[***], representing one (1) completed Study subject, will be made within thirty (30) days of Contract Execution. Institution agrees that this initial payment is an advance to be earned by completing Study visits or procedures and that any amount of this advance not earned will be repaid to Sponsor.

Ongoing Payments

Subsequent payments will be assessed on a quarterly basis. Based upon enrollment Institution will invoice Sponsor [***]and study payment will be provided within [***] days of receipt of invoice providing data has been received on subjects and all outstanding queries have been resolved.

Payment for Screen Failures

Payment for work involved in screening potential subjects who are not enrolled into the Study will be made in the amount listed in the Budget for screen failures, limited to a maximum of [***] potential screen fail subjects. Institution agrees to use reasonable efforts to select appropriate potential subjects to screen.

Payment of Additional Study Related Invoiceable Costs

Sponsor shall also pay additional Study related costs as these occur as per budget:

Final Payment

A final payment, which includes study close-out and all outstanding payments due and/or withheld, and will be sent within [***] days after all Data has been received by Sponsor and any outstanding queries have been resolved.

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH “[***]”. AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

Invoice Schedule

Invoice Interval	**Directs**	**26% F&A**	**10% F&A**	**Total Not to Exceed**	**Activity**
Upon Contract Execution	[***]	[***]	[***]	[***]	[***]
Subject Fees					
Quarterly	[***]	[***]	[***]	[***]	[***]
Study Related Invoiceable Items (invoiced only if activity occurs)					
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
Quarterly	[***]	[***]	[***]	[***]	[***]
At completion of Study	[***]	[***]	[***]	[***]	[***]
Total Not to Exceed				[***]	

Additional Payment Terms

The Parties acknowledge that the Budget amounts represent an equitable exchange for the conduct of the Study in light of the professional time and expenses required for the Study.

Sponsor acknowledges and agrees that payments made payable or sent to any individual or entity other than as specified herein shall not be credited towards fulfillment of Sponsor’s obligations under this Agreement.

Institution agrees to provide [***], to perform responsibilities under the Study. Sponsor agrees to provide Institution with [***] as specified in the Protocol.

In the event of early termination of the Study by Sponsor, pursuant to this Agreement, Sponsor shall pay all costs accrued by Institution as of the date of termination, including non-cancelable obligations, incurred prior to the effective date of termination.

APPENDIX A
Supply Agreement

MANUFACTURING AND SUPPLY AGREEMENT

This Manufacturing and Supply Agreement (together with any exhibits or attachments hereto, this "Supply Agreement") shall form a part of the Clinical Trial Agreement (the "Clinical Trial Agreement"), dated January 22, 2018, by and between Regents of the University of Minnesota ("Institution") and Magenta Therapeutics, Inc. ("Magenta"). Capitalized terms used but defined herein shall have the meaning ascribed to them in the Clinical Trial Agreement.

WHEREAS the Institution shall perform a clinical trial for Magenta pursuant to the Clinical Trial Agreement;

WHEREAS Magenta wishes Institution to manufacture and supply the Study Drug to be used in the Study;

WHEREAS the Study shall be guided by the Clinical Trial Agreement; only the manufacture and supply of the Study Drug and certain material transfer requirements are dealt with by this Supply Agreement.

NOW THEREFORE, the parties agree as follows:

THE SERVICES

1.1 Institution agrees to manufacture and supply the Study Drug for the Study as further described in Annex A ("Services"). The manufacture and supply of the Study Drug as described in this Supply Agreement shall be considered part of the Study.

1.2 Institution shall coordinate the Services with the timelines of the Study and shall provide the Services in a timely manner related to the Study. Institution shall provide the Services in a professional manner, in conformance with that level of care and skill ordinarily exercised by other professionals in similar circumstances; and in compliance with all applicable laws and regulations.

1.3 Institution shall provide the Services in accordance with the terms of this Supply Agreement as well as with the quality assurance agreement ("QA Agreement") attached hereto as Annex B. In the event of any inconsistencies between this Agreement and the QA Agreement, this Supply Agreement shall prevail with the exemption of quality related topics where the QA Agreement shall prevail.

1.4 Institution shall not be entitled to subcontract the Services (in whole or in part) without the prior written consent of Magenta. Notwithstanding the foregoing, Institution shall be allowed to subcontract Services to [***]. For the sake of clarity, in case Institution receives Magenta's consent according to this Section 1.4, such consent shall not release Institution from any obligations and/or liabilities under this Supply Agreement. Moreover, Institution shall ensure that its subcontractor is bound by the same terms as defined in this Supply Agreement and the QA Agreement. Institution shall also ensure Magenta obtains the right to audit the subcontractor(s) in accordance with the terms defined in the QA Agreement.

1.5 The parties shall regularly communicate about all relevant matters with regard to the Services. Institution shall promptly inform Magenta about any unforeseen results, problems, difficulties, or delays with regard to the Services. In case of a delay in the execution and/or performance of the Services, Institution shall notify Magenta immediately and the parties shall mutually agree on adapted timelines.

1.6 Magenta shall provide to Institution on an ongoing basis during the term of this Agreement such information and data as Institution reasonably requires for the performance of the Services.

1.7 Institution shall grant Magenta access to all primary data generated in the course of the Services, including without limitation electronic raw data and data contained in laboratory notebooks. Magenta shall have the right to obtain copies of Institution's primary data at regular intervals at the expense of Magenta.

1.8 Institution will apply certain analytical and other technologies and materials to provide the Services. Institution makes no representation or warranty regarding ownership or the right to use rights to the intellectual property which it shall use to perform the Services pursuant to this Supply Agreement.

MAGENTA MATERIAL

2.1 To allow Institution to perform the Services, Magenta has transferred and will transfer to Institution biological and/or chemical materials ("Magenta Materials") as well as related data, documents, information, and reports. Magenta Materials shall also include any progeny and derivatives of the Magenta Materials. Magenta Material is described in Annex A. Except for the Magenta Materials, Institution shall supply all materials and standard processing and manufacturing equipment needed to provide the Services and manufacture the Study Drug in accordance with this Agreement.

2.2 Institution shall use Magenta Materials and the related data, documents, information, and reports only to perform the Services and in accordance with this Supply Agreement and the Material Transfer Provisions as set forth in Annex C hereof. Magenta Material will not be used for any other purposes, including but not limited to commercial production or sale. For the sake of clarity, Institution shall acquire no rights, title and interest in Magenta Materials and/or any progeny and derivatives thereof and the Magenta Materials shall be Magenta's Confidential Information pursuant to the Clinical Trial Agreement.

2.3 Institution shall store all Magenta Materials and the related data, documents, information, and reports in an appropriate manner, in a secure location and in accordance with Magenta's instructions (if any).

OWNERSHIP AND INTELLECTUAL PROPERTY

3.1 For the sake of clarity, any Invention arising under this Supply Agreement during the manufacturing and supply of the Study Drug will be deemed a Sponsor Invention pursuant to Section 8 of the Clinical Trial Agreement.

MISCELLANEOUS

4.1 Annexes. All Annexes to this Supply Agreement shall form an integral part of this Supply Agreement and are incorporated herein by reference. With regard to any conflict between the terms of such Annexes and the terms of this Supply Agreement, this Supply Agreement shall govern.

ANNEX A

Services

1. **PERFORMANCE OF SERVICES**

The Institution shall manufacture and supply the Study Drug for the Study.

The Study Drug is manufactured by expansion of stem cells derived from umbilical cords by using an aryl hydrocarbon receptor (AHR) antagonist, such as Magenta compound [***] or equivalent production reagent, according to current Manufacturing Instruction(s), in compliance with Good Manufacturing Practices under FDA and in accordance with the QA Agreement established between the parties.

MATERIAL SUPPLY REQUIRED FOR STUDY DRUG

Magenta Materials

Magenta will deliver free of charge the following Magenta Materials to Institution:

[***]

Other Materials

All other material and supply required for the manufacture of the Study Drug will be covered by the manufacturing costs described Exhibit B of the Clinical Trial Agreement.

[*Remainder of page left blank intentionally*]

Annex B

ANNEX B

QUALITY ASSURANCE (QA) AGREEMENT

The Quality Assurance (QA) Agreement established between Magenta and Institution shall form a part of the Supply Agreement and is incorporated therein by reference. QA Agreement follows ANNEX C.

[*Remainder of page left blank intentionally*]

ANNEX C

MATERIAL TRANSFER PROVISIONS

Institution and Magenta agree to comply with the following terms and conditions with respect to the Magenta Materials provided to Institution in connection with the Services:

1. Institution is regularly engaged in conducting laboratory studies, and has all the required authorizations to perform any experimental work at the place of investigation that are required for the Services. In particular, Institution is entitled under all applicable laws and regulations to perform the Services using Magenta Materials.

2. Magenta is regularly engaged in producing materials for laboratory studies and has all the required authorizations to produce the Magenta Materials and to provide them to Institution for the experimental work at the place of investigation that are required for the Services. In particular. Magenta is entitled under all applicable laws and regulations to produce and provide the Magenta Materials for performance of the Services.

3. Magenta Materials will be used in full compliance with all laws and regulations applicable in the country where the Services are performed, especially all guidelines for use of Magenta Materials. Institution employees working on the Services have adequate training and facilities to use Magenta Materials and will directly supervise the Services.

4. Magenta Materials have been and will be produced and shipped, and all guidelines for use of the Magenta Materials will be provided, in full compliance with all applicable laws and regulations, including with the GMP regulations of the FDA.

5. Magenta Materials have been and will be used solely for performance of the Services in the facilities of Institution under suitable containment conditions in accordance with all applicable laws and regulations. Magenta Materials have not been and will under no circumstances be administered to humans. Magenta Materials may be used for production of Study Drug(s) that are to be administered to humans.

6. Magenta Materials have not been and will not be analyzed, modified, copied or used other than necessary for the purpose of the Services without prior written consent of Magenta.

7. Without the prior written consent of Magenta, Magenta Materials have not been and will not be transferred or made available to any individual other than those under the supervision and control of Institution's project manager assigned to the performance of the Services and who are bound to (i) obligations of confidentiality and non-use with respect to Confidential Information that are consistent with the terms of the Clinical Trial Agreement and (ii) assign and otherwise effectively vest in Institution any and all rights that such individual might otherwise have in the results of their work as required for Institution to fulfill its obligations to Magenta under this Supply Agreement. At the end of the performance of the Services, Magenta may require Institution to return or destroy any unused Magenta Materials in accordance with all applicable laws and regulations and reasonable instructions of Magenta (if any).

8. Magenta Materials have been and are being supplied to the Institution with no warranties, express or implied, of merchantability or fitness for a particular purpose or otherwise. In particular, Magenta does not represent or warrant that the use of Magenta Materials will not infringe or violate any patent or proprietary rights of third parties.

9. Magenta Materials have been and will be used with caution and prudence in any experimental work. Institution accepts Magenta Materials with the understanding that the hazardous and toxicological properties of the Magenta Materials may not have been completely investigated and therefore are unknown. Institution has and will handle the Material accordingly and has and will inform Magenta in writing of any adverse effects experienced by persons handling the Material.

10. Magenta shall notify Institution of any hazardous or toxicological properties of the Magenta Materials that are known to Magenta at the time Magenta Materials are provided to Institution and will inform Institution in writing of any hazardous or toxicological properties of the Magenta Materials that become known to Magenta during the course of the Services.

[*Remainder of page left blank intentionally*]

QUALITY AGREEMENT ON DEVELOPMENT, MANUFACTURING, PACKAGING AND TESTING

Between

MAGENTA THERAPEUTICS, INC.

50 Hampshire Street, Cambridge, MA 02139

as contract giver, subsequently named MAGENTA,

and

REGENTS OF THE UNIVERSITY OF MINNESOTA

including the Molecular and Cellular Therapeutics Facility (MCT) at

1900 Fitch Avenue, University of Minnesota, 55108 St. Paul, MN, USA
as contract acceptor, subsequently named ACCEPTOR

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

QUALITY AGREEMENT ON DEVELOPMENT, MANUFACTURING, PACKAGING AND TESTING

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TABLE OF ENCLOSURES

QUALITY AGREEMENT ON DEVELOPMENT, MANUFACTURING, PACKAGING AND TESTING

PREAMBLE

MAGENTA is engaged in the development and research of certain pharmaceutical products and requires assistance in the development and manufacture of active pharmaceutical ingredients for its clinical trial. MAGENTA desires to entrust ACCEPTOR to perform certain GxPs activities related to the development and manufacture of biological pharmaceutical products in the USA. ACCEPTOR is interested in performing such activities for MAGENTA.

ACCEPTOR is registered with the FDA (number [***]).

ACCEPTOR shall provide a copy of the newest registration form of the national health authority valid for contracted activities. ACCEPTOR shall inform MAGENTA of any change / update in the registration status as certified by the health authority and shall provide relevant updated documentation, as long as this Quality Agreement remains valid.

ACCEPTOR shall perform manufacturing according to the GMP level necessary to produce FDA Phase I/II products. As used in this Quality Agreement (as defined below), "GMP" shall mean current good manufacturing practices, including the regulations promulgated by the United States Food and Drug Administration or any successor entity thereto (the "FDA") under the Federal Food, Drug, and Cosmetic Act, 21 C.F.R. Parts 210 and 211, as amended from time to time, applicable guidance documents issued by the FDA, and applicable documents developed by the International Conference on Harmonization (ICH) to the extent that they are applicable to Study Drug and the parties hereunder.

ACCEPTOR and MAGENTA are to define their roles and responsibilities according to the intentions of the GMP guidelines, FDA regulatory requirements for investigational products and the FDA 21 CFR 1271 requirements. In addition to the requirements below ACCEPTOR shall follow the guidelines of the US Code of Federal Regulations and the corresponding national guidelines prevailing at the time of the manufacture.

SCOPE OF THE QUALITY AGREEMENT

This quality agreement (together with any exhibits or attachments hereto, this "Quality Agreement") forms an integrated part of the Clinical Trial Agreement (the "Clinical Trial Agreement"), dated January 22, 2018. by and between ACCEPTOR and MAGENTA. Capitalized terms used but defined herein shall have the meaning ascribed to them in the Clinical Trial Agreement. The enclosures to this Quality Agreement, which are an integral part of this Quality Agreement, (i) define the contacts for all technical and quality matters (see Enclosure A), (ii) cover the products together with their storage and transport conditions listed in Enclosure B, (iii) define the manufacturing and testing documents (see Enclosure C), assign the roles and responsibilities of both parties (see Enclosure D), (v) establish the reliance of MAGENTA on the decisions made by ACCEPTOR or other involved contractors (see Enclosure E) and (vi) list the changes to this Quality Agreement (see Enclosure F). The enclosures must be signed by the quality responsible persons only. The PRODUCT hereinafter refers collectively to the expanded and depleted stem cell fractions set forth in Enclosure B: List of Products and later called "PRODUCT".

In the event of a conflict between the Quality Agreement and the Clinical Trial Agreement then the Clinical Trial Agreement shall govern, except to the extent such provisions are violating the GMP regulations or other regulatory requirements.

GENERAL PROVISIONS (QUALITY ASSURANCE)

Directives and Guidelines

If not otherwise defined in this Quality Agreement the provisions of ACCEPTOR**'S** and its approved contractor's quality management system and standard operating procedures shall be provided to MAGENTA prior to the start of the manufacturing of the PRODUCT and shall be applied to the ACCEPTOR'S and its approved contractor operations. The following general guidelines (see table 1) are considered as standards for quality assurance and shall be adhered to by ACCEPTOR in performing its obligations under the Manufacturing and Supply Agreement between MAGENTA and ACCEPTOR, dated as of the date hereof (the "Supply Agreement").

Table 1: Guidelines to Good Manufacturing Practices and Good Tissue Practices

Organization	Regulation / Guidance
FDA	21 CFR Part 210, 211 (Current Good Manufacturing Practice), 600, 1271 and 11 (as relevant)
FDA	Guidance for Industry and FDA Staff -Investigational New Drug Applications (ENDs) for Minimally Manipulated, Unrelated Allogeneic Placental/Umbilical Cord Blood Intended for Hematopoietic Reconstitution for Specified Indications
FDA	21 CFR 312 (in support of MAGENTA submissions)
FDA	Guidance for Industry - cGMP for Phase 1 Investigational Drugs (July, 2008) Guidance for Industry - Eligibility Determination for Donors of Human Cells, Tissues, and Cellular and Tissue-Based Products (I ICT/Ps) (August 2007)

MAGENTA shall prepare, submit and maintain all Study regulatory applications for the MAGENTA sponsored clinical studies. ACCEPTOR will provide (and shall cause its authorized subcontractors to provide) documentation required by MAGENTA to make an application to any regulatory authorities and to answer any questions by such regulatory authority. MAGENTA will be solely responsible for filing regulatory submissions worldwide. MAGENTA agrees to provide ACCEPTOR with current relevant parts of applications and submission documents to ensure the compliance of ACCEPTOR activities.

ACCEPTOR shall maintain information about the PRODUCT and its processing for such time and in such manner as required by the FDA, provided, however, that ACCEPTOR shall notify MAGENTA if information is requested by FDA, and/or any other regulatory authorities and permit MAGENTA to review any such information on general issues relating to its facilities and general functions and to review such responses as pertaining to the PRODUCT, processing of the PRODUCT and Magenta Products and processes. ACCEPTOR shall also assist MAGENTA in preparing responses to information requests, as needed, and ACCEPTOR shall also assist (to the extent requested by Magenta) in the preparation of IND documentation in relation to the authorities and shall respond (only to the extent requested by MAGENTA) to any queries and requests for information from such other regulatory authorities.

Manufacturing, Packaging and Testing Instructions and Specifications

ACCEPTOR and its contractors shall apply the manufacturing, packaging and testing monographs (comprising specifications as well as methods) referenced in Enclosure C. If MAGENTA's specifications are incorporated into ACCEPTOR'S documentation (or its contractors'), ACCEPTOR will assure that these conversions are accurate, updated as appropriate and that a cross-reference to the appropriate MAGENTA specifications) is referenced in the source document.

Inspections and Audits

ACCEPTOR agrees that its facilities, operations and quality systems are audited at a minimum annually by MAGENTA in order to ensure compliance with the appropriate level of GMP guidelines and applicable MAGENTA standards. MAGENTA is entitled to perform audits for cause (e.g. undesirable events, launch of products) and/or to send a representative to ACCEPTOR'S or its contractor's facilities at mutually agreed times during the manufacturing and testing of the PRODUCTS and at reasonable intervals.

ACCEPTOR will address audit observations in a timely manner (not greater than [***] days). MAGENTA has the right to stop any operation for MAGENTA if an audit reveals any violation of agreed upon standards and regulations. In case of deviations from standards, regulations or procedures, ACCEPTOR shall open a deviation in its local deviation management system. ACCEPTOR should inform MAGENTA in a timely manner of any perceived or anticipated deviations from standards, regulations or procedures.

ACCEPTOR shall allow U.S. federal and local governmental authorities to inspect facilities, operations and quality systems, as it is necessary to facilitate, obtain or maintain the registration in the USA. A representative of MAGENTA may participate only in inspections directly related to MAGENTA activities.

ACCEPTOR shall notify MAGENTA of inspections by regulators within [***] hours of ACCEPTOR awareness related to the manufacture of Magenta products by the ACCEPTOR. ACCEPTOR must notify MAGENTA about critical or major issues encountered during authority inspections that adversely affect the quality of products manufactured for MAGENTA and must provide a copy of the inspection report and the proposed corrective actions within [***] business days.

In case MAGENTA is inspected, MAGENTA agrees to inform ACCEPTOR about critical or major issues encountered during authority inspections that adversely affect the quality of materials provided by MAGENTA to ACCEPTOR.

If not otherwise agreed, the audit rights shall survive [***] years upon the termination of this Quality Agreement.

Person in Plant (PIP)

MAGENTA shall have the right on reasonable prior notice and mutually agreed upon timing and duration as deemed necessary by MAGENTA, to observe the processing, packaging, storing, testing and shipment of Products provided other customer's confidentiality is respected. MAGENTA may inspect ACCEPTOR'S and its approved subcontractors' reports and records relating to the processing pursuant to this Quality Agreement during normal business hours and with reasonable advance written notice.

In addition, MAGENTA shall have the right to provide a MAGENTA employee (a "PIP") based on mutually agreed upon timing and duration on ACCEPTOR'S or its authorized subcontractor's premises for the purpose of information exchange and coordinating reviews, approvals or other actions required by this Quality Agreement, the Clinical Trial Agreement or the Supply Agreement.

The PIP [***].

ACCEPTOR shall ensure that the PIP is kept fully informed of all issues that arise that may affect the quality of the PRODUCT.

MAGENTA shall permit the PIP to provide input and approvals on behalf of MAGENTA as necessary during manufacturing and quality operations.

Key-Performance Indicators

ACCEPTOR'S service may be rated by MAGENTA. ACCEPTOR shall provide MAGENTA with data to calculate Key Performance Indicator (KPI) or Critical to-Quality Parameter (CTQ) on a regular basis. MAGENTA will provide a template to ACCEPTOR for completion.

Annual Product Review/Product Quality Review (APR/PQR)

For each PRODUCT under development, ACCEPTOR shall provide [***] to MAGENTA an updated PRODUCT master file.

ACCEPTOR shall write experience reports to MAGENTA for each PRODUCT after completion of the process validation and of manufacturing. [***] days prior to due date MAGENTA will send a request to the ACCEPTOR for information. This information is required to be sent to MAGENTA within [***] days of receipt of MAGENTA's written request for such information.

Subcontracting

ACCEPTOR is entitled to subcontract its services to the contractors listed in Enclosure E, provided that ACCEPTOR will only subcontract to subcontractors not listed on Enclosure E only after written approval by MAGENTA. The enclosure will be updated as necessary in case of a newly approved contractor. Any change of the approved subcontractors or of their respective service levels requires MAGENTA's prior written approval.

ACCEPTOR shall remain solely and fully responsible for the performance of the work by sub-contractors in accordance with the requirements set forth in this Quality Agreement including compliance with GMPs. ACCEPTOR shall provide copies of audit reports pertaining to subcontractor services upon request of MAGENTA.

ACCEPTOR shall oblige its subcontractors to inform ACCEPTOR of changes relevant to the development, manufacturing and testing of PRODUCTS, such as to the manufacturing location and procedures, or to the equipment and materials used. Furthermore, with respect to changes that could interfere with the quality of the PRODUCTS, such as to the testing procedures, instructions and specifications. ACCEPTOR shall inform MAGENTA within [***] days after having received such information.

ACCEPTOR will ensure that authorized subcontractors accept foreign and local governmental authorities to inspect facilities, operations and quality systems pursuant to this Quality Agreement. MAGENTA has the right to accompany ACCEPTOR during the audit of its subcontractors.

Qualification and Validation (incl. Computer Systems)

Processes: ACCEPTOR represents and warrants that processes for manufacturing, testing (in-process, quality control) and first packaging are validated. Cleaning procedures for non-dedicated equipment must be verified for efficiency. Product shipments shall be performed under controlled conditions in qualified shipment containers. All processes must be carried out under GMP standards. Product-specific validation protocols shall be sent to MAGENTA after ACCEPTOR review has been completed and shall be reviewed and approved by MAGENTA before such validation protocols are implemented. Product-specific validation and qualification reports shall be sent to MAGENTA after ACCEPTOR review has been completed and shall be reviewed and approved by MAGENTA.

Equipment: The manufacturing, testing and storage instructions shall be followed using calibrated and/or qualified equipment. Qualification protocols and reports are approved by ACCEPTOR.

Computer Systems: ACCEPTOR is responsible to ensure that critical computer systems used for operations in cleaning, manufacturing, testing (in-process, quality control), packaging, storage and shipment are qualified / validated, managed by appropriate SOPs, used by trained operators and subject to documented change control. Approved validation protocols, reports, testing protocols, raw data and system operation procedures shall be available for inspection by MAGENTA.

Change Management and Approval

Changes to this Quality Agreement and its relevant enclosures shall only be made by mutual agreement between the parties and must be in writing and signed by an authorized representative of each party.

ACCEPTOR shall inform MAGENTA of changes relevant to the registration status of PRODUCTS, such as to the manufacturing location and procedures, to the equipment and materials used and furthermore, to changes that could interfere with the quality and safety of the PRODUCTS, such as to the testing procedures, instructions and specifications.

ACCEPTOR or MAGENTA, as applicable, shall prepare a change request in writing upon identification of a necessary change as indicated above. In such change request, the following items, at a minimum, shall be defined:

a comparative description of the change (current versus intended status)

the rational for the change

a GMP assessment

regulatory assessment

medical/safety assessment (if applicable)

MAGENTA will decide, at its sole discretion, to approve or reject the change request following an inter-functional evaluation. MAGENTA will inform ACCEPTOR of its decision within [***] days after having received the change request or notification of a necessary change.

Influence on Quality by Foreign Materials

MAGENTA must be informed in advance and upon request in writing, of each critical compound or processing of critical compounds in the same area as any PRODUCT. The term "critical" as used in this Section 2.10 shall mean [***].

If a starting/raw material is of animal origin, the ACCEPTOR shall attempt to obtain from the vendor a statement regarding the country of origin of the animal material or TSE Certificate according to Note for Guidance EMEA/410/01, Rev. 2 or applicable update. If a CoA on starting material is provided to MAGENTA, it shall clearly state the origin of the material.

MAGENTA reserves the right to request copies of any or all questionnaires related to the starting materials used for their PRODUCT. The use of animal or human derived raw material requires prior written approval by MAGENTA. For material of bovine or ruminant origin, a TSE Certificate of Suitability (CoS) from the European Directorate for the Quality of Medicines (EDQM) is required. In case such information could not be provided for a material, ACCEPTOR, with the support of MAGENTA if necessary, should be able to document that FDA has agreed with the use of the material for human use.

For starting/raw materials, excipients, cleaning agents, softeners or lubricants, or primary packaging materials procured by MAGENTA, it is MAGENTA's responsibility that materials supplied to ACCEPTOR are in compliance with the TSE Guideline *(Note for Guidance on minimizing the risk of transmitting spongiform encephalopathy agents via human and veterinary medicinal products* (EMEA/410/01, Rev. 2 or applicable update) and/or acceptable by FDA for clinical GMP use.

The traceability and safety documentation will be provided to MAGENTA upon request.

ACCEPTOR shall ensure that cord blood is supplied from cord blood banks that are registered with the FDA. ACCEPTOR shall ensure cord blood is supplied from MCT approved vendors when possible. In cases where an acceptable cord blood cannot be identified from an approved vendor, the cord blood may be obtained from a vendor that has not been approved by MCT.

Maternal samples of cord blood units (the mother) must be tested and found negative for HIV 1/2, HBV, HCV, Syphilis, and HTLV I/TL. The samples' donor (mother) must be screened for high risk social and medical history that may be attributable to Human Immunodeficiency Virus and Hepatitis. The cord blood pre-processing culture must be negative for growth.

ACCEPTOR is responsible to maintain traceability information supplied by the cord blood bank, which includes donor screening, HLA type and product characteristics.

If CBU (called a UCB or Unrelated Cord Blood unit in the clinical protocol) is 'unlicensed", the Sponsor will make the final decision on use of the CBU.

Deviations, Corrective and Preventative Actions

Deviation/failure investigations must be handled according to the corresponding ACCEPTOR or approved subcontractor standard operating procedure. ACCEPTOR or approved subcontractor will send copies of completed deviations to MAGENTA so that MAGENTA may perform its review. Major deviations (including, without limitation, modifications to the approved protocols or GMP documents) that may have an impact on the release decision must be reported to MAGENTA within [***] after occurrence or as soon as a determination has been made of the potential to adversely affect the quality or compliance of the PRODUCT to its specification. MAGENTA reserves the right to reject concerned batch(es).

Minor deviations may be reported to MAGENTA with batch release documentation. Major deviations and minor deviations will be provided in English to MAGENTA. Additionally, any issues that could potentially disrupt the supply of MAGENTA"s PRODUCTS must be immediately communicated to the appropriate contact person (see Enclosure A).

Defective Products

MAGENTA shall be entitled to reject a batch that does not meet the specifications or where a major deviation (need to define) has occurred during the manufacture. Should MAGENTA officially delegate to ACCEPTOR the responsibility to release product batches, ACCEPTOR**'S** qualified person is entitled to decide if a batch should be rejected and to inform MAGENTA within one (1) working day. Any dispute regarding the determination of a deviation or failure's root-cause or the planned corrective and preventative actions shall be resolved in good faith between the parties.

DEVELOPMENT

ACCEPTOR shall collaborate with MAGENTA for all development activities, including without limitation, technical development of PRODUCT process and testing method, manufacture and testing of PRODUCT, elaboration of specifications and test methods for raw materials and PRODUCT, test method validation, scale-up, method and technology transfer of production and process validation.

The following reports shall be made available to MAGENTA for sign off as required by the type/content of the protocol and/or report: PRODUCT development reports, process and analytical method validation protocols (plans) and reports and on request by MAGENTA, all other additional documents related to the Study, including copies of the raw data.

RAW MATERIAL

Procurement and Delivery of Non-Active Starting/Raw Material

ACCEPTOR shall be responsible for the release of all raw and packaging materials that ACCEPTOR will supply. ACCEPTOR shall procure raw material only from approved suppliers or from MAGENTA approved suppliers.

ACCEPTOR will supply to MAGENTA a list of used raw materials. This document will be mutually approved by ACCEPTOR and MAGENTA QA.

Sampling

This requirement is not applicable for the cord blood CBU.

Testing and Release

Raw materials like reagents, consumables etc. are for clinical research use. These materials are released and tested according the ACCEPTOR'S procedure.

For materials supplied by MAGENTA and provided to ACCEPTOR, MAGENTA is responsible for testing, release and retention sample storage. MAGENTA procures raw material only from the approved suppliers. Upon receipt of raw materials supplied by MAGENTA the containers shall be checked by ACCEPTOR and/or its approved contractors within [***] days for:

external condition and intact, authentic seal,

compliance of the containers and labeling with the delivery documents and the certificate of analysis (CoA).

ACCEPTOR will rely on supplier CoA for the release of the raw materials.

Upon receipt of material supplied to ACCEPTOR, all starting/raw material lots have to be released for compliance with the approved specifications. Lot release is based on review of the supplier Certificate of Analysis and testing of raw material according to specifications by the material manufacturer.

ACCEPTOR shall inform MAGENTA, for quality or safety reasons, within five (5) business days on recalls or call-back of material by suppliers and brokers, which have been used in the manufacturing process of MAGENTA product.

Storage

Storage containers and storage/transport conditions must ensure that the specified quality of starting materials is not impaired. ACCEPTOR will store starting materials under ACCEPTOR and/or its approved contractors standard storage conditions which have been approved by MAGENTA and considered by MAGENTA as suitable and appropriate for the above purpose.

Labels

In process and final labels are the responsibility of ACCEPTOR and are controlled by ACCEPTOR'S quality system. Final product labels required to be submitted in regulatory filings shall be approved by MAGENTA.

MANUFACTURING OF PRODUCTS

ACCEPTOR assumes full responsibility for the manufacture, bulk packaging and In-Process Control (IPC) of the PRODUCT even if these activities are partially performed by a contractor. Manufacture, IPC. analytical testing, packaging and shipment of the PRODUCT are carried out according to ACCEPTOR and MAGENTA approved documents.

Batch Manufacturing and Packaging Records

ACCEPTOR assures that manufacture and packaging of the produces are carried out according to the mutually agreed manufacturing procedures and packaging instructions (see Enclosure C). ACCEPTOR will submit the master batch record to MAGENTA for approval before the first start of manufacture of PRODUCTS, or before an approved change is implemented. Any change to those documents should be managed as described in the Change control section of this Quality Agreement (or according to the deviation section in case of urgent modification needs).

ACCEPTOR compiles and archives clear structured batch documentation for each batch of the products. The manufacturing batch records as well as testing documentation kept by ACCEPTOR have to comply with the applicable GMP guidelines.

ACCEPTOR assures that upon special request from MAGENT A, the following documents will be provided as copies within [***] working days to MAGENTA:

[***]

ACCEPTOR and/or its approved contractors will prepare for each batch the complete batch documentation which is necessary for the manufacture and release of the PRODUCT batches in accordance with applicable cGMP.

The complete batch manufacturing record must include the following information:

[***]

The batch packaging record provides in addition to above information the following:

[***]

Reprocessing and Rework

Any use of materials or PRODUCT not meeting the specifications after testing is not allowed unless authorized in writing by MAGENTA.

Reprocessing in the sense of repeating process steps that are part of the established manufacturing procedure are only allowed in exceptional cases and require prior written approval from MAGENTA unless otherwise necessary to ensure patient safety.

Rework of PRODUCTS in the sense of performing process steps that are different from the agreed manufacturing process is not allowed unless otherwise necessary to ensure patient safety and require prior written approval from MAGENTA QA, ACCEPTOR Medical Director, Principal Investigator, and ACCEPTOR QA who must approve changes prior to product release.

Review of Batch Documentation

After detailed review of the batch documentation of each batch by ACCEPTOR (including manufacturing and testing records), ACCEPTOR QA is responsible to ensure that a statement of compliance with FDA requirements is included or attached to the certificate of analysis (CoA) that is signed by a qualified person. A suitable format of this statement or document as well as a check list for the detailed review will be mutually agreed upon.

Unless otherwise delegated, MAGENTA will conduct a full batch record review in addition to ACCEPTOR. ACCEPTOR will systematically provide to MAGENTA the batch documentation for each lot of PRODUCT no later than [***] days after the final sign-off by ACCEPTOR QA. MAGENTA QA will perform final regulatory/quality product release.

If necessary MAGENTA may request additional documents related to the batch records (example: CoA from raw materials).

Storage and shipments

ACCEPTOR is responsible to ensure that products are stored under appropriate conditions of temperature and humidity, light and cleanliness so that identity, strength and purity of the PRODUCTS are not affected even during interim storage or shipment. In the event that the quality of the stored PRODUCTS could be adversely affected for any reason, ACCEPTOR shall take immediate action to prevent further damage. In any case ACCEPTOR shall inform MAGENTA in writing within [***] days.

The requirements regarding the storage of the PRODUCTS are defined in Enclosure B.

TESTING OF PRODUCTS

ACCEPTOR assumes full responsibility for the testing of PRODUCT. ACCEPTOR and/or its approved contractors shall carry out all tests of PRODUCT as specified in the corresponding agreed documents and the responsibility list. Testing shall be performed by laboratories approved by ACCEPTOR and that meet Center for Medicare and Medicaid Services, where applicable.

Upon request from MAGENTA, ACCEPTOR accepts to provide copies of the following reports:

(a) [***]

(b) [***]

(c) [***]

Method Transfer

When test methods have to be transferred, ACCEPTOR and/or its approved contractors will conduct a formal method transfer according to its standard operating procedure.

Reference Standards

NA

Testing of Products

ACCEPTOR and/or its approved contractors will carry out appropriate testing according to the test documents as listed in ENCLOSURE C. The testing of PRODUCTS must be performed according to properly transferred methods if applicable, which has been qualified (early phase) or fully validated (process validation, registration stability) as appropriate, by properly trained or qualified technicians using qualified or calibrated tools as necessary. ACCEPTOR and/or its approved contractors shall prepare the complete analytical documentation which is required for the release of the PRODUCT.

The Certificate of Analysis (CoA) and/or testing records must include:

[***]

Out of Specification Results

Out of Specification investigations will be handled according to ACCEPTOR current standard operation procedure for deviations. ACCEPTOR and/or its approved contractors undertake to investigate any suspect result. Any unusual result will be reported for comments to MAGENTA together with an outline of the planned investigation. If a PRODUCT fails one of the safety tests performed before release, then the materials cannot be injected into humans unless otherwise agreed on by the ACCEPTOR Medical Director, Principal Investigator, Program Coordinator/Supervisor. ACCEPTOR QA, MAGENTA QA and the FDA. MAGENTA must be informed of such decision within one (1) working day. Confirmed out of specification results must be reported to MAGENTA within one (1) working day after occurrence. After completion of the investigation, the OOS final report will be handed over to MAGENTA with the batch records. Initial OOS results due to laboratory failure will be mentioned as comment in the final CoA or analytical report.

Furthermore, ACCEPTOR and/or its approved contractors agrees to inform any Out-of-Expectation (OOE) result, i.e. an individual finding or final result which does lie within the stipulated specification, but strongly deviates from expectations, to MAGENTA within five (5) working days after observation by ACCEPTOR.

ARCHIVING OF SAMPLES AND DOCUMENTATION

ACCEPTOR and its approved contractors ensure that (retain & reference) samples and documentation related to the development, manufacture and testing of the PRODUCT are archived under defined conditions as follows:

Archiving Object	**Archiving Period**
Raw data of GMP-relevant work, including data from trial or batch for study specific documentation	[***]
Derived data in form of protocols, final reports, summaries, conclusive documents	[***]
Registration relevant documents, e.g. methods etc.	[***]
Equipment documentation (including IT/facility documentation including qualification/ calibration), SOPs	[***]
Personnel training records	[***]
Traceability for patient receiving batch	[***]

Prior to destruction of any reserve/retention samples or project and product documentation, ACCEPTOR and its approved contractors will inform MAGENTA and will ship the samples and documents back to MAGENTA, as requested. No document or sample can be destroyed without MAGENTA's prior written approval.

MAGENTA delegates taking and storage of reserve/retention product samples to ACCEPTOR and its approved contractors. The reference sample amount shall be defined within the batch production record and is based on not compromising the usability of the patient product. If taking this reference sample could jeopardize the final PRODUCT volume and patient outcome, such rationale shall be documented and the sample shall not be collected.

At least one sample from each product must be available as a retention sample. ACCEPTOR ensures that on special request from MAGENTA, e.g. in response to a health authority request, reference samples are provided for dispatch within [***] days. The samples must be shipped in a manner to ensure integrity of the sample, MAGENTA will confirm the receipt.

RELEASE OF PRODUCTS

Release for clinical/human use

The release of the PRODUCTS is limited to distribution within [***].

The release for infusion of the PRODUCTS for clinical use is the responsibility of the qualified person of the ACCEPTOR. The main responsibilities in this context are:

[***]

Final product release is performed by ACCEPTOR and MAGENTA. MAGENTA retains legal responsibility and both parties perform the release per their respective standard operating procedures, to include:

[***]

The delegation of final product release responsibility solely to ACCEPTOR qualified person by MAGENTA is discretionary and only effective after positive outcome of an ACCEPTOR qualification process. The qualification of ACCEPTOR and release delegation must be in writing. [***].

PRODUCT SECURITY

Waste Material

Waste material shall be disposed of in a secure, environmentally friendly and legal manner preventing unauthorized use. ACCEPTOR keeps complete records of material destruction and waste, disposal per the University of Minnesota policies. Rejected finished PRODUCT and any rejected labeling and packaging components bearing the MAGENTA name must be [***]. ACCEPTOR shall provide a proof of destruction within the batch record.

Counterfeiting

ACCEPTOR notifies MAGENTA immediately in writing of any known incident or any suspicion of counterfeit product and shall help in any necessary investigation requested by MAGENTA. ACCEPTOR will take any necessary action requested by MAGENTA to secure the PRODUCT supply.

In order to prevent theft and subsequent misuse of MAGENTA material (e.g. bulk drug substance or drug product, primary or secondary packaging material) ACCEPTOR shall:

- store those material in secure areas
- store most sensitive items (e.g. authenticity labels, tamper evident labels etc.) most carefully
- control and limit access for employees, visitors or 3rd parties on a needs-only basis
- perform regular inventory checks
- destroy excess, waste or rejected MAGENTA material after confirmation from MAGENTA to proceed with the destruction, in a secure and legal manner, preventing environmental problems and unauthorized use according to University of Minnesota policies and considering also local environment laws
- control and reconcile the quantity of destroyed/disposed MAGENTA material

transport MAGENTA material in a secure and safe way, according to MAGENTA agreed procedures. MAGENTA products shall only be shipped to MAGENTA or MAGENTA approved third parties according to MAGENTA instructions.

PRODUCT SURVEILLANCE

MAGENTA is responsible for handling complaints from the clinical investigation sites, and shall reply to inquiries as promptly as possible. MAGENTA shall provide the necessary information to ACCEPTOR and render assistance to ACCEPTOR as required, if PRODUCT manufactured by ACCEPTOR and/or its approved contractors are involved. ACCEPTOR and/or its approved contractors shall without delay investigate technical complaints and report preliminary results to MAGENTA within [***] days at the latest. Final results shall be provided to MAGENTA within [***] days of completion. If the test period is unable to be met, ACCEPTOR will notify MAGENTA to arrange an agreed upon timeframe. Complaints of a critical nature (including without limitation no effect or side effect, counterfeits, safety issues) must be investigated without any delay and interim results reported to MAGENTA within [***] days.

TERMS AND EXPIRATION

This Quality Agreement forms an integrated part of the Clinical Trial Agreement and the Supply Agreement and shall come into force together with each such contract. The Quality Agreement and its enclosures shall be subject to the regular review by the parties as needed.

This Quality Agreement shall be terminated upon expiration or termination of the Supply Agreement. Prior to termination of the Supply Agreement, in case of a change of control or bankruptcy ACCEPTOR shall offer all manufacturing and testing related documentation to MAGENTA for further archiving. ACCEPTOR shall keep original copies of all documentation.

The failure by either of party to exercise or enforce any of the terms or conditions of this Quality Agreement shall not constitute or be deemed a waiver of that party's right thereafter to enforce each and every term and condition of this Quality Agreement.

If any one or more of the provisions of this Quality Agreement shall, for any reason, be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision of this Quality Agreement, and this Quality Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

DEFINITIONS

Starting material	Any material used in the synthesis of an API or in the production of a medicinal product (excluding packaging material).
Auxiliary material	Any material used for manufacture, maintenance of equipment or buildings which is not directly in contact with a starting or packaging material, e.g. lubricants, detergents, silicon rubber.

Packaging Material	Any material employed in the packaging of a medicinal product, excluding any outer packaging used for transportation or shipment. Primary packaging material is in direct contact with the product, secondary packaging refers to all other materials.
Other definitions	See Clinical Trial Agreement

ENCLOSURE A: List of QA/QC Liaisons

MAGENTA

Name	Function	Dept.	Tel/fax
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]

ACCEPTOR

Name	Function.	MCT Dept.	Tel/fax
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]

QUALITY AGREEMENT ON DEVELOPMENT, MANUFACTURING, PACKAGING AND TESTING

ENCLOSURE B: List of Products

Magenta Part No.	Acceptor's No.	Material Description	Storage Condition	Transport Condition	Shelf-life
[***]	[***]	[***]	[***]	[***]	[***]
[***]		[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]	[***]

* Keep Cool, Do Not Freeze

ENCLOSURE C: Manufacturing and Testing Documents

Materials for use in manufacturing shall be jointly approved by ACCEPTOR and MAGENTA in approved master processing record(s). Testing of raw materials for use in manufacturing is not a responsibility of ACCEPTOR.

Test methods are written and approved by ACCEPTOR, within ACCEPTOR QMS and in compliance with the IND and regulatory requirements. As required, methods are approved by MAGENTA.

Master batch records are written by ACCEPTOR and reviewed and approved by ACCEPTOR and MAGENTA.

Certificates of Analysis for each final product batch are written and approved by ACCEPTOR.

ENCLOSURE D: Table of Responsibilities

A = [***]
B = [***]
C = [***]

In the event of a conflict between the responsibilities listed in the table below and the core body text of the Quality Agreement, the text in the core body of the Quality Agreement shall prevail.

Who What (Manufacture)	A	B	C
Supply Chain Management/Transport	[***]	[***]	
Product development (process, methods)	[***]		
Manufacture of Product	[***]		
Testing of Product	[***]		[***]
Primary Packaging	[***]		
Secondary Packaging	[***]		
Release of product for infusion clinical use	[***]		
Final product release after all testing is concluded.	[***]	[***]	
Storage (materials, product)	[***]		
GENERAL REQUIREMENTS			
Audit, and approve facilities and quality systems and evaluate ACCEPTOR'S licensing compliance			[***]
Comply with FDA requirements			[***]
Supply safety and disposal data regarding materials supplied			[***]
Validate computer systems used for manufacturing and testing			[***]
MANUFACTURE OF PRODUCT			
Prepare master formulae, manufacturing instructions, and product specifications			[***]
Approve master formulae, manufacturing instructions, and product specifications			[***]
File master formulae, manufacturing instructions, and product specifications TND, as required			[***]
Purchase, sample, inspect,), store and release starting/raw materials and packaging materials			[***]
Prevent use of material critical to the quality of products			[***]
Archive records of raw material			[***]
Perform process and cleaning validation			[***]
Manufacture product			[***]
MANUFACTURE OF PRODUCT			
Define specifications for primary packaging material			[***]
Approve specifications for primary packaging material			[***]
Prepare packaging instruction			[***]

MANUFACTURE OF PRODUCT	
Approve packaging instruction	[***]
Purchase, sample, inspect primary packaging material	[***]
Release primary packaging material	[***]
Archive records of primary packaging material testing	[***]
Investigate process deviation	[***]
Inform about critical and major process deviations prior to release	[***]
Perform testing of product	[***]
Store reference sample of product:	[***]
Archive records of manufacturing (batch record)	[***]
Prepare and provide certificates of analysis, certificates of compliance	[***]
Provide testing and manufacturing records on request	[***]
Provide reports regarding deviations or non-conformances during manufacture on request	[***]
Approve deviations or non-conformance reports	[***]
Assign shelf-life and storage conditions	[***]
Define batch number	[***]
TESTING OF PRODUCT	
Develop testing methodology	[***]
Validate testing methodology	[***]
Issue testing instruction (Testing Monograph)	[***]
Approve testing instruction (Testing Monograph)	[***]
Perform tests according to Testing Monograph	[***]
Collect all results and prepare analytical report	[***]
RELEASE for clinical use (for infusion and as final product)	
Check or confirm compliance of product	[***]
Confirm final product retention samples	[***]
Prepare and approve COA	[***]
Evaluate deviation report(s)	[***]
Release product for infusion	[***]
Final product release after all testing is concluded	[***]
Other ACTIVITIES	
Evaluate change request	[***]
Approve change requests	[***]
Assign expiry periods and storage conditions	[***]
Initiate customer complaint file	[***]
Investigate clinical complaints	[***]
Contribute to complaint investigations	[***]
Final assessment of complaints	[***]
Investigate adverse drug reaction reports	[***]
Investigate requirement to stock recovery of product	[***]
Write and approve stability protocols and reports	[***]

Other ACTIVITIES

Perform limited stability testing	[***]
Maintain basic regulatory / FDA documents	[***]
Review ACCEPTOR performance for qualification	[***]
Delegate release for final product release responsibility only if supported by a positive ACCEPTOR qualification	[***]
Responsible for Clinical Study Applications and Clinical Operations	[***]
Responsible for regulatory filing submissions	[***]
Provide Support for regulatory activities by review of relevant documents	[***]

ENCLOSURE E: List of Approved Subcontractors

[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
		[***]	[***]
		[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
		[***]	[***]
		[***]	[***]
[***]	[***]	[***]	[***]
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		[***]	[***]
		[***]	[***]
[***]	[***]		[***]
[***]	[***]	[***]	[***]
		[***]	[***]
		[***]	[***]

[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

Enclosure F: History of changes

Document Part	Version	Date	Reason for change
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]

Exhibit 10.10

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

MASTER DEVELOPMENT AND MANUFACTURING AGREEMENT

This Master Development and Manufacturing Agreement (including all appendices hereto, this "Agreement") is entered into as of February 13, 2018 (the "Effective Date") by and between Magenta Therapeutics, Inc., a Delaware corporation having offices at 50 Hampshire Street, 8th Floor, Cambridge, MA 02139 ("Magenta"), and Bachem Americas, Inc., a California corporation, having offices at 3132 Kashiwa Street, Torrance, CA 90505 ("Bachem"). Magenta and Bachem may be referred to individually as a "Party" or collectively as the "Parties."

RECITALS

WHEREAS, Magenta is engaged in the development and research of certain pharmaceutical products and requires assistance in the development and manufacture of active pharmaceutical ingredients for its clinical trials; and

WHEREAS, Bachem is a contract manufacturer that possesses the necessary technical capabilities and operates pharmaceutical process development facilities for both the development and manufacture of pharmaceutical products used in clinical trials, as required by Magenta; and

WHEREAS, Magenta desires Bachem to provide the Services and manufacture the Products specified in Project Plans (as defined below); and

WHEREAS, Bachem is willing to provide the Services, manufacture the Product, and fulfill the Project Plans on the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the mutual promises contained herein, and for other good and valuable consideration, the receipt and adequacy of which each of the Parties does hereby acknowledge, the Parties, intending to be legally bound, agree as follows.

Section 1. DEFINITIONS

As used herein, the following terms shall have the following meanings:

1.1 "Affiliate" shall mean any corporation or other entity which controls, is controlled by, or is under common control with, a Party to this Agreement. A corporation or other entity shall be regarded as hi control of another corporation or entity if it owns or directly or indirectly controls more than fifty percent (50%) of the voting stock or other ownership interest of the other corporation or entity, or if it possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of the corporation or other entity or the power to elect or appoint fifty percent (50%) or more of the members of the governing body of the corporation or other entity.

1.2 "Applicable Laws" means all relevant federal, state and local laws, statutes, rules, regulations, and ordinances and industry standards and guidelines as in effect on the Effective Date or adopted thereafter and which are applicable to a Party's activities hereunder in their respective countries, including, without limitation, the applicable regulations and guidelines of the FDA and all applicable GMPs together with amendments thereto.

1.3 "Batch" means a specific quantity of Product that is intended to have uniform character and quality, within specified limits, and is produced according to a single manufacturing order during the same cycle of manufacture.

1.4 "CMC" shall mean (i) manufacturing process development for Product; (ii) all chemistry, manufacturing and control procedures necessary for the manufacturing, testing and quality control release of Product; and (iii) sourcing and testing of all raw materials and components used in the production of any Product.

1.5 "[***]" means the specific sequence(s) defined in Appendix B.

1.6 "Development Specifications" shall mean the requirements of all Applicable Laws and the procedures, process parameters, analytical tests and other attributes and written specifications for the Development Work attached hereto as part of a Project Plan.

1.7 "Development Work" shall mean those development Services that are to be performed by Bachem hereunder and which may include work related to identifying, formulating, developing and demonstrating cost effective, reproducible Product and manufacturing a feasibility Batch.

1.8 "DMF" means a Drug Master File as described in 21 C.F.R. § 314.420.

1.9 "Effective Date" has the meaning set forth in the introduction.

1.10 "FDA" means the United States Food and Drug Administration or any successor entity thereto.

1.11 "GMPs" shall mean current good manufacturing practices, including the regulations promulgated by the FDA under the United States Food, Drug and Cosmetic Act, 21 C.F.R. Part 210 *et seq.*, as amended from time to time, applicable guidance documents issued by the FDA, applicable documents developed by the International Conference on Harmonization (ICH) to the extent that they are applicable to Product and the Parties hereunder.

1.12 "Governmental Authority" means any court, including any political subdivision thereof, court instrumentality, or agency thereof, and any other federal, state, or public authority, domestic or foreign, exercising governmental powers and having jurisdiction over any activity of a Party under this Agreement.

1.13 "IND" means an investigational new drug application relating to a Product, and includes such applications submitted to the FDA and equivalent applications submitted to a Governmental Authority outside of the U.S.

1.14 "Latent Defect" means a defect which could have been detected (but was not) by the analytical test methods in operation at the date of shipment to Magenta, attributable to an act or omission of Bachem that causes a Product to fail to conform to the Specifications, which may not be discoverable upon the inspection and testing which Magenta would have been expected to carry out in its ordinary course of business, but is discovered at a later time.

1.15 "Product" means the product to be developed or manufactured by Bachem pursuant to a Project Plan.

1.16 "Project Plant(s)" means a mutually agreed to project plan, statement of work, quotation or other ordering document that sets forth a description of the Services to be provided by Bachem, and related timeline(s), costs, and other relevant details, that references, and is expressly governed by this Agreement and is executed by an authorized representative of each Party. Notwithstanding, the Parties acknowledge and agree that the quotations identified in Appendix A attached hereto are Project Plans, and are governed by this Agreement, even though they do not expressly reference this Agreement.

1.17 "Services" means, with respect to a Project Plan, those services (including Development Work and manufacture of Product) to be provided by Bachem, as described in such Project Plan.

1.18 "Specifications" means the requirements of all Applicable Laws, the master batch record, current standard operating procedures and the procedures, process parameters, analytical tests and other attributes and written specifications for the Product attached hereto as part of a Project Plan, which the Parties agree are necessary for the manufacture and release of the Product for use in clinical trials. The Parties recognize that specifications for Product for a specific Project Plan are likely to change during the term of this Agreement, and the Parties agree to act in good faith and reasonably to effect such changes as may be required. Copies of such Specifications, as amended, shall be maintained by both Parties, and shall be incorporated into this Agreement and the Quality Agreement (as defined below).

1.19 "Third Party" means any entity other than Magenta or Bachem.

1.20 "U.S." means the United States of America, its territories, commonwealths, and possessions, including the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, and all other places under the jurisdiction thereof.

Section 2. ENGAGEMENT OF BACHEM

Magenta hereby engages Bachem to perform the Services and manufacture the Product in accordance with the applicable Project Plan(s) and in compliance with Applicable Laws and the terms and conditions set forth herein, and Bachem hereby accepts such engagement. Bachem will supply to Magenta all Product ordered by Magenta hereunder as set forth in the Project Plan and related purchase orders.

Section 3. PROJECT PLANS

3.1 Project Plans. All Project Plans entered into after the Effective Date shall be added to Appendix A after execution by the Parties of a written amendment in the form of the "Amendment to Appendix A", attached hereto (the "Amendment"). There shall be no limit to the number of Project Plans that may be added to Appendix A and governed by the terms and conditions of this Agreement. In the event of a conflict between the terms of a Project Plan or any attachments thereto or any purchase order issued in connection therewith and this Agreement, the terms of this Agreement will govern.

3.2 Content of Project Plans. Each Project Plan shall include a description of the Services to be provided, including, if applicable, the Development Work to be completed, the Product to be manufactured, relevant Development Specifications, relevant Specifications, deliverables, a corresponding budget, a schedule for completion of the Project Plan (which may be set forth for the entire Project Plan or stages thereof), a fee and payment schedule, delivery terms, and such other information as the Parties determine is necessary for Bachem to perform the Services and manufacture the Product. Magenta may amend any Project Plan before its completion, subject to prior written approval by Bachem, which approval shall not be unreasonably withheld. If such amendment entails additional expenses that will be incurred by Bachem, the Parties agree to reconsider in good faith the budget and the payment and fee schedule.

3.3 Materials and Equipment. Unless otherwise agreed by the Parties in writing or specified in the applicable Project Plan, Bachem shall supply all materials and standard processing and manufacturing equipment needed to provide the Services and manufacture the Product in accordance with this Agreement and the applicable Project Plan, at its sole cost and expense.

3.4 Change Orders. In the event that Magenta requests or requires Bachem to perform services that are outside the scope of this Agreement, or Magenta desires to amend a Project Plan, such changes must be mutually agreed upon by the Parties in a written change order (a "Change Order") prior to the provision of said services or implementation of such amendment by Bachem. Each such Change Order constitutes an amendment to the Agreement and/or the applicable Project Plan, and thereafter the services or amendments set forth therein shall be deemed Services hereunder.

3.5 Project Manager. With respect to each Project Plan, an employee of Bachem shall be appointed as project manager by Bachem (the "Project Manager"). The Project Manager shall be the primary contact for Magenta and shall timely address all issues and concerns raised by Magenta, as well as provide to Magenta all information requested by Magenta concerning this Agreement or the Services. The Project Manager shall not be replaced without advanced written notice to Magenta. In the event that Bachem becomes aware that the Project Manager plans to leave the employment of Bachem or shall be unable to complete the Services due to dismissal, death or disability, it shall give immediate written notice of the same to Magenta so as not to impact ongoing manufacture or supply. Should Magenta not be satisfied with the services of Project Manager, Magenta may give notice of the same to Bachem and Bachem will assign a suitable replacement who is reasonably acceptable to Magenta within [***] of such notice.

Section 4. COMPENSATION

4.1 Generally. The fees to be paid to Bachem in connection with the Services shall be set forth in reasonable detail in each Project Plan. Bachem represents that it has included all of its costs, fees and expenses, including administrative overhead, in calculating the fee for the Services budget attached hereto as part of the applicable Project Plan, and that Magenta shall not be liable for or be charged for any other costs, fees or expenses of Bachem. No line item in any Project Plan budget shall be exceeded by Bachem without the prior written consent of Magenta.

4.2 Invoicing and Payment. Unless specifically agreed otherwise in writing by the Parties, including as agreed in a Project Plan, (i) all invoices and payments hereunder shall be in U.S. Dollars, (ii) payments will be made payable to Bachem at the address set forth in applicable Project Plan(s), and (iii) all undisputed payments shall be made within [***] of receipt of invoice by Magenta.

4.3 Taxes. All prices are stated exclusive of VAT (or equivalent tax) that may or may not become due according to Applicable Law. Each Project Plan shall set forth an estimate of VAT that may become due thereunder and Bachem shall notify Magenta within a reasonable period of time upon becoming aware of a material deviation from such estimate.

4.4 Bachem's Fees for Performance of Services. Bachem's fees for the performance of Services represent the entire cost for the provision of such Services. Magenta shall not be charged for any Service or deliverable that is not performed or delivered, as the case may be, in accordance with this Agreement or the applicable Project Plan(s).

Section 5. BACHEM REPRESENTATIONS, WARRANTIES, AND CERTAIN COVENANTS

5.1 Authority. Bachem represents and warrants mat it has full authority to enter into this Agreement and there is no provision contained in any other agreement to which it is party or arrangement or obligation to which it is bound that prohibits or restricts it from entering into or performing under this Agreement.

5.2 Services. Bachem shall provide the Services in accordance with each Project Plan. Bachem will perform all Services in accordance with this Agreement and the agreed upon Specifications. All Products shall be packaged, labeled and shipped in accordance with this Agreement, the applicable Project Plan and all Applicable Laws. Bachem and its employees and agents have, and will continue to have, the knowledge, experience, facilities, equipment and skill to provide, and will provide, the Services in a professional and timely manner. Services will conform to consistently high standards of workmanship and the specifications applicable to each Project Plan.

5.3 Material/Supplies. In situations where Magenta provides materials or supplies to Bachem in connection with this Agreement and/or a Project Plan(s), Bachem shall use such materials and supplies only in accordance with the applicable Project Plan for which it was received, and Bachem shall not use it for any other purpose. Bachem shall be responsible for all such materials and supplies provided by Magenta while they are in Bachem's control or the control of its agents, and Bachem shall promptly, at Magenta's direction, destroy or return to Magenta all unused quantities of its materials and supplies provided by Magenta. For the avoidance of doubt, Magenta shall retain title to all of its materials and supplies, including any API or intermediates, while it is in Bachem's facility (as of the Effective Date, this facility will [***]. Magenta shall be responsible for all such materials and supplies until delivered to Bachem at its facility. Any such materials or supplies shall be delivered in a timely manner and in accordance with the shipping instructions and specifications to be agreed upon by the Parties.

5.4 Deliverables. Each deliverable (including Product) developed or produced in connection with a Project Plan and this Agreement shall conform to the Specifications. The Development Work, as described in the Project Plan, shall conform to the Development Specifications. Bachem shall warrant compliance with the agreed acceptance criteria together with the results as reported on the Certificate of Analysis in conjunction with the analytical methods at the time of the release of Product. In no event shall Bachem be liable for any defects that could not have been detected by Bachem with the analytical test methods in operation at the date of product release. For reasons of clarity, the Parties acknowledge and agree that it shall remain solely the responsibility and liability of Magenta to determine the suitability of the Product for any intended or specific use of the Product. Bachem makes no expressed or implied guarantees, warranties or undertakings as to the use of the Product for an intended or specific purpose or use.

5.5 Third Party IP. Bachem will not knowingly infringe or misappropriate any third party intellectual property rights in connection with the performance of its obligations hereunder. Materials delivered by Magenta to Bachem will not, to Magenta's knowledge, infringe any third party intellectual property rights.

5.6 No Encumbrance. Bachem hereby (i) acknowledges and agrees that neither it, nor any of its affiliates or subsidiaries, nor any of its or their directors, officers, employees and agents has any interest in Magenta Pre-Existing Intellectual Property or Magenta Developed Intellectual Property (each as defined below) and (ii) covenants that it will not lien or encumber, or otherwise cause, permit or consent to the granting of a lien or encumbrance of Magenta Pre-Existing Intellectual Property or Magenta Developed Intellectual Property.

5.7 Books and Records. Bachem shall maintain true, complete and accurate books, records, test and laboratory data, reports and all other information relating to Services performed and Product manufactured under this Agreement, including all information required to be maintained by Applicable Laws.

5.8 Disclosures. Upon Magenta's reasonable request, Bachem shall also provide all information to Magenta that is specifically related to the Product and Services, including any information which is reasonably required to comply with any disclosure requirements of regulatory authorities.

5.9 Regulatory Inspections. Bachem shall make its facilities and all records relating to the Product, and Services related thereto, available to the FDA or other regulatory authorities, as mutually agreed by the Parties, and shall notify Magenta immediately if the FDA or any other regulatory authority begins or schedules an inspection of Bachem's records, facilities, or manufacturing processes that are solely related to the Product or the Services related thereto. Bachem shall provide Magenta access to any documentation related to or resulting from each such inspection in accordance with the provisions of the Quality Agreement. If a regulatory authority in connection with a preapproval inspection of the Product inspects the Bachem facility used for production of Product, Bachem will notify Magenta in writing within [***] after learning of the inspection unless otherwise specified in the Quality Agreement. If an FDA Form 483 (or an equivalent foreign regulatory authority form) is issued in connection with the Product, Bachem will provide its proposed response to such Form 483 (or equivalent form) to Magenta

for Magenta's review and (non-binding) input in accordance with the provisions of the Quality Agreement. Bachem will consider in good faith any comments and suggestions provided by Magenta with respect to such proposed response if received by Bachem in a timely manner. For the avoidance of doubt, nothing in this Agreement shall hinder Bachem from providing its answers to regulatory authorities within the timelines required by such authorities.

5.10 Report of Noncompliance. In the event that an employee or agent of Bachem who is working on a Project Plan fails to comply with Applicable Laws, this Agreement or any applicable agreement as the same relates to the Services, and such failure is discovered by or comes to the attention of Bachem's COO or a supervisor of Bachem with respect to the applicable Project Plan, Bachem will immediately notify Magenta in writing. Appropriate action will be taken by Bachem at the direction of Magenta, after Bachem consults in good faith with Magenta, as to what actions might be undertaken by Bachem in view of the particular facts surrounding such noncompliance.

5.11 Information. Upon request, Bachem shall provide to Magenta access to all information in Bachem's control that relates to the [***], Product and/or the Project Plan within a reasonable period of time. Copies of batch records will be provided on an electronic platform for a period of [***], or another period of time by mutual agreement of the Parties, and with restricted access rights only.

5.12 Debarment. Bachem hereby certifies that it does not and shall not employ, contract with or retain any person directly or indirectly to perform Services under this Agreement or any Project Plan if such person is or has been debarred under 21 U.S.C. 335a (a) or (b) or other equivalent laws, rules, regulations or standards of any other relevant jurisdiction. Upon written request of Magenta, Bachem shall, [***], provide written confirmation that it has complied with the foregoing obligation. Bachem agrees to immediately disclose in writing to Magenta if any employee or agent is debarred, or if any action or investigation is pending or, to the best of Bachem's knowledge, is threatened in relation to the debarment of Bachem or any person performing Services in connection with this Agreement.

5.13 Restrictions on Bachem. Bachem agrees to supply the Product(s) identified in each applicable Project Plan to Magenta pursuant to the terms and conditions of this Agreement and any applicable Project Plans. During the Initial Term and any Renewal Term, Bachem agrees not to sell, supply or otherwise distribute [***] for any clinical or commercial use to any Third Party without Magenta's prior written consent, for so long as Bachem remains Magenta's primary supplier of [***] for the Initial Term and any Renewal Term.

5.14 Changes by Bachem. Bachem shall not make any major changes to the Development Specifications, the Specifications or any manufacturing process with a potential to adversely impact the quality of the Product in connection with a Project Plan without the prior written consent of Magenta. Notwithstanding, Magenta acknowledges and agrees that changes will be required for the development of the Product. Thus, during the development phase of a Product and up to the completion of the full validation of the manufacturing process of a Product, some quality assurance standards may not be fully implemented or applied in the manufacturing, release and supply of such Product. These limited quality assurance standards may relate to (i) the manufacturing and testing procedures in development and/or (ii) formalized

Product specific procedures that may not be in place and generic procedures that may be applied instead and/or (iii) change control that may be less stringent during development and/or (iv) Product specific validation may not be available. However, Bachem will manufacture the Product according to applicable GMP guidelines as defined in the Quality Agreement.

5.15 DMF/Amendment. Upon Magenta's reasonable request and order, Bachem will compile a DMF for the Product in cooperation and mutual agreement with Magenta. Bachem hereby grants to Magenta, at no additional cost, reference rights to the DMFs, which are necessary to support Magenta's regulatory submissions with respect to the Product. Bachem shall provide reasonable advance written notice to Magenta prior to amending any Bachem DMF that is referenced in a filed IND of Magenta or in a proposed IND filing of Magenta. Bachem will, at Magenta's expense, provide reasonable assistance as necessary so that the FDA (and/or equivalent foreign regulatory authority) can reference the relevant DMF. Bachem shall not permit the FDA or any other regulatory authority to reference its DMF in order to permit a Third Party to develop, manufacture or commercialize [***] or any products that incorporate [***] or compete with [***]. In the event that the Parties agree that Bachem will not file a DMF in connection with a Project Plan, Bachem shall instead fully cooperate with Magenta, and provide a quote (similar to the compiling of a DMF) to provide all information, data, and rights of reference reasonably required by Magenta in connection with its regulatory and governmental filings related to Product.

5.16 Waste Disposal. Bachem shall generate, handle, store, ship and dispose of all wastes associated with its manufacture of Product in accordance with Applicable Laws. Notwithstanding the foregoing sentence, if any specially regulated waste must be removed pursuant to a given Project Plan, such specially regulated waste and the process for its removal shall be expressly set forth in such Project Plan. If the specially regulated waste is solely attributable to Magenta's Product and the Specifications and instructions for production of such Product, then unless the Parties otherwise agree, Magenta shall be responsible for the reasonable costs associated with the removal of such specially regulated waste. Such costs shall be included in the Project Plan or, if not specified therein, included in the price of the Services and Product.

5.17 Audits. Magenta and its agents and designees shall have the right to audit Bachem's facilities, systems, records, procedures, and documentation related to this Agreement. In connection with any such audit, Bachem shall also provide Magenta access to its personnel. Magenta may conduct no more than one (1) technical visit and one (1) quality assurance audit per year, unless there is cause for an additional audit (i.e., a technical issue or quality issue). Such audits may be conducted upon reasonable notice during the term of this Agreement and for [***] thereafter. On-site technical discussions may also be requested and held at mutually agreeable times.

5.18 Person-In-Plant. If reasonably requested by Magenta, at a mutually agreed day and time, Bachem will permit and provide working space for Magenta to staff one person on location at Bachem's premises, limited to no more than [***] days, during preparation for manufacturing and packaging of the Product. Such person shall be given reasonable access to all records, facilities and personnel working on any Services or Project Plans for the purpose or providing advice, coordinating reviews, approvals or any other actions required to ensure compliance with this Agreement to the extent that it does not compromise the confidentiality of other customers.

5.19 Quality Agreement. As reasonably required by Magenta in connection with Product manufacturing activities hereunder, Bachem shall enter into a written quality agreement with Magenta (the "Quality Agreement").

Section 6. ADDITIONAL PRODUCT SUPPLY TERMS

6.1 Delivery. Unless otherwise agreed to between the Parties, delivery terms shall be DDP (Incoterms 2010) Magenta's facility located at 50 Hampshire Street, 8th Floor, Cambridge, MA 02139, or such other destination as Magenta may instruct in writing, at which time risk of loss and responsibility for Product will transfer to Magenta. Bachem shall assume all risk and responsibility for handling, storing, rotating stock, packaging, loading and shipping all Product in accordance with applicable Incoterms. Bachem shall ship the Product in accordance with the applicable Project Plan. Delivery shall occur on the delivery dates set forth in each Project Plan and any related purchase orders or as otherwise agreed to in writing by the Parties.

6.2 Acceptance and Rejection of Products.

(a) Promptly following receipt of Product, Magenta shall have the right but not the obligation to test such Product to determine compliance with the Specifications. Magenta shall have [***] after receipt of the Product to notify Bachem in writing of any rejection of Product based on a sufficiently documented claim that the Product fails to meet the Specifications. In the event that Magenta does not inform Bachem within the [***] period that the Product does not meet the Specifications, Magenta shall be deemed to have accepted the Product. If there is no dispute between the Parties over a claim that the Product fails to meet the Specifications, Bachem shall (i) replace or (ii) with Magenta's prior written consent, reprocess or rework the rejected Product within an agreed upon time frame, after the notice of such rejection, and in any case as soon as reasonably possible after receiving such notice, provided that Magenta shall, at Bachem's expense, provide to Bachem sufficient quantities of supplies required to be supplied by Magenta under the relevant Project Plan, at no additional cost to Magenta (including transportation costs), and Bachem shall make arrangements with Magenta for the return or disposal of any rejected Product, such return shipping or disposal charges to be paid by Bachem. In the event of a discrepancy between Magenta's and Bachem's test results such that one Party's test results fall within relevant Specifications and the other Party's test results fall outside the relevant Specifications, or there exists a dispute between the Parties over the extent to which such failure is due to acts or omissions of Bachem, the Parties shall cause an independent GMP laboratory or appropriate experts promptly to review records, test data and perform comparative tests and/or analyses on samples of the alleged defective Product. Such independent laboratory shall be mutually agreed upon by the Parties. The independent laboratory's results shall be in writing and shall be final and binding save for manifest error. Unless otherwise agreed to by the Parties in writing, the costs associated with such testing and review shall be borne by the Party against whom the independent laboratory rules.

(b) If Bachem shall fail to deliver to Magenta the full quantity of the Product as specified in a Project Plan by the delivery date specified therein, for any reason whatsoever other than a breach of this Agreement by Magenta, then at Magenta's election: (i) Bachem shall be relieved of any obligation to deliver the remaining quantity of the Product or (ii) Bachem shall deliver the remaining quantity of the Product as soon as reasonably possible after the date Magenta notifies Bachem of such election. Magenta and Bachem will agree upon the time period to deliver the remaining Product allowed under clause (ii) [***] of the missed delivery date (or, if applicable, the date on which Bachem notifies Magenta that such delivery will be late).

6.3 Latent Defects; Contamination.

(a) As soon as either Party becomes aware of a Latent Defect in any lot of Product, but in no case later than (i) within one (1) week after reaching such awareness or (ii) the end of the indicated retest period for the lot with the Latent Defect, whichever is earlier, it shall immediately notify the other Party. Bachem shall be fully responsible for all Latent Defects. At Magenta's election, the lot or batch with the Latent Defect shall be deemed rejected as of the date of such notice and the provisions of Section 6.2 shall apply.

(b) Bachem shall be fully responsible for any Product and/or Product-related supplies that are adulterated, contaminated, damaged or destroyed while in Bachem's control. Bachem agrees, at the election of Magenta and in addition to any other remedies Magenta may have, to promptly replace such Product and/or Product-related supplies (as the case may be) or refund to Magenta the value of the Product or Product-related supplies.

6.4 Stability, Record Keeping. Bachem shall retain such Product stability samples and keep manufacturing records, and any other records set forth in a Project Plan, for [***] from the expiration or termination of this Agreement. Bachem shall make accessible for review by Magenta during an audit or inspection, or following Product release by Bachem's Quality Assurance Department, either onsite or on an electronic platform with restricted access rights only (as reasonably requested by Magenta), at a mutually agreeable time, all specific Batch and lot records relevant to Bachem's performance hereunder, including written investigations of any deviations and "out-of-specification" events that may have been generated from manufacturing, packaging, inspection, or testing processes.

6.5 CMC Responsibilities; Regulatory Submissions; Permits. Bachem shall be responsible for obtaining and maintaining, at its sole expense, any facility or other licenses or permits, and any regulatory approvals, necessary for the manufacture of Product, supply of Product, and performance of Services, all in accordance with the terms and conditions of this Agreement, At Magenta's request and expense, Bachem shall also compile the regulatory submissions documentation for the Product (i.e. CMC documentation and DMF) as reasonably requested by Magenta, including permitting the FDA to reference Bachem's DMF, once it is available, in connection with Magenta's IND.

6.6 Recall. In the event of a recall of Product, Magenta shall be responsible for coordinating such recall. Magenta promptly shall notify Bachem if any Product is the subject of a recall and, to the extent required by Bachem, provide Bachem with a copy of all documents relating to such recall. Bachem shall cooperate fully with Magenta in connection with any recall. Magenta shall be responsible for all of the costs and expenses of such recall, except to the extent

that Bachem is determined to be responsible for such recall. In such case, Bachem shall be responsible for such costs and expenses. Such determination of responsibility may be made by the governmental agency involved or by mutual agreement by the Parties following examination and review of all records pertinent to the manufacture of the Product subject to such recall. In case of shared responsibility, the costs should be allocated in accordance with each Party's share of responsibility.

Section 7. TERM AND TERMINATION

7.1 Term. This Agreement shall commence on the Effective Date and shall extend for a period of Five (5) years thereafter ("Initial Term"), unless this Agreement is terminated earlier as provided herein or is extended by mutual written agreement of the Parties. This Agreement may be renewed for additional periods of one (1) year (each such additional period, a "Renewal Term") unless either Party provides notice of nonrenewal upon not less than [***] prior written notice to the other Party. Notwithstanding the foregoing, each Project Plan may have separate term and termination provisions, so long as the term of any Project Plan does not extend beyond the Initial Term or a subsequent Renewal Term.

7.2 Termination. This Agreement or any Project Plan may be terminated:

(a) by Magenta for any reason upon [***] written notice to Bachem;

(b) by either Party if the other Party materially breaches a provision of this Agreement or a Project Plan, and fails to cure such breach within [***] following receipt of written notification of such breach from the non-breaching Party;

(c) by either Party, immediately, if the other Party becomes insolvent, is dissolved or liquidated, makes a general assignment for the benefit of its creditors, or files or has filed against it, a petition in bankruptcy that is not dismissed within sixty days after filing, or has a receiver appointed for a substantial part of its assets; and

(d) by a Party or the Parties pursuant to Section 13.

In the event of termination pursuant to Section 7.2(a) or a termination by Bachem pursuant to Section 7.2(b), Bachem shall be compensated for Services rendered up to the date of termination. In the event of any other termination, the Parties shall negotiate in good faith to determine the appropriate amount to be paid by Magenta to Bachem (or refunded to Magenta by Bachem, as the case may be), in light of the circumstances of such termination, in compensation for all Services rendered in accordance with this Agreement. In the event of Bachem's inability to supply the Product or a material breach by Bachem pursuant to Section 7.2(b), Bachem shall provide, without additional charge to Magenta, sufficient information and technology pertaining to its Services to Magenta and/or its technically competent designee, such that Magenta and/or its technically competent designee are enabled to continue Development Work and manufacture of the Product. The termination of any Project Plan may be independent of the termination of this Agreement.

7.3 Regulatory information and Compounds. On or before the effective date of any termination or expiration of this Agreement or upon the written request of Magenta, Bachem shall promptly transfer to Magenta all compounds and other materials and supplies provided to Bachem by or on behalf of Magenta in connection with this Agreement, as well as all works-in-process and raw materials purchased under a Project Plan. Upon the expiration or termination of this Agreement or upon the written request of Magenta, Bachem will also compile CMC documentation as provided for in the applicable Project Plan, which will contain all information necessary for Magenta for regulatory and manufacturing purposes related to the Product. The CMC documentation would also contain the information required for any competent Third Party manufacturing to assume manufacturing of the Product independently, if Magenta desires to transfer the process. Upon the request of and at the expense of Magenta, after termination of this Agreement, Bachem agrees to reasonably assist Magenta in identifying Third-Party manufacturers of the Product. If such termination is due to Bachem's inability to make the Product, or a material breach by Bachem pursuant to Section 7.2(b), Bachem will provide such assistance without charge.

7.4 Project Plans in Progress. In the event of any termination or expiration of this Agreement, Bachem shall, upon the request of Magenta and notwithstanding the effective date of any termination or expiration, complete any Project Plans involving the manufacture of Product that were accepted by Bachem prior to such date, and Magenta shall pay Bachem for any Product produced or services completed, in accordance with the terms of the applicable Project Plans and this Agreement. If this Agreement is terminated by Magenta pursuant to Section 7.2(a) or by Bachem pursuant to Section 7.2(b) or (c), Magenta shall also pay to Bachem amounts for any services that cannot be reasonably stopped at the time of termination; provided, that, Bachem will take all reasonable steps necessary to wind down such work as promptly as practicable.

7.5 Survival. The rights and obligations of each Party which by their nature survive the termination or expiration of this Agreement shall survive the termination or expiration of this Agreement, including Sections 4.2, 5, 6.3-6.6, 7.2-7.5, 8, 9, 10, 11, 12, 14, 15.1, 15.4-15.8, 15.10, 15.11 and 15.12. In addition, Bachem hereby acknowledges that neither expiration nor termination of this Agreement shall affect in any manner Magenta's right to manufacture and sell, or have manufactured and sold, the Product.

Section 8. INTELLECTUAL PROPERTY

8.1 Magenta Pre-Existing Intellectual Property. All intellectual property (including trademarks), including all data, information, know-how, reports and any and all related documentation, which are developed, generated or derived, directly or indirectly by or on behalf of Magenta prior to the Effective Date ("Magenta Pre-Existing Intellectual Property") shall remain the sole property of Magenta.

8.2 Bachem Intellectual Property. All intellectual property (including trademarks), including all data, information, reports, manufacturing know-how and any and all related documentation, which are (a) developed, generated or derived, directly or indirectly by or on behalf of Bachem prior to the Effective Date or (b) any manufacturing know-how developed or generated by Bachem that is generally applicable to the field of peptide manufacturing and not specific to the Product or Magenta's Confidential Information (such items under the foregoing clauses (a) and (b), collectively, "Bachem Intellectual Property"), shall remain the sole property of Bachem. In the event that any Bachem Intellectual Property is incorporated into any

deliverable (including Magenta Developed Intellectual Property (including Product)) or is otherwise necessary to fully exploit such deliverable, Bachem hereby grants to Magenta a perpetual, irrevocable, nonexclusive, worldwide, paid up, royalty-free license under such Bachem Intellectual Property (with the full right to sublicense directly or indirectly through multiple tiers) to (i) copy, distribute, display, perform and create derivative works of the Bachem Intellectual Property, in whole or in part; and (ii) to use Bachem Intellectual Property and/or practice the subject matter thereof, in each case solely in connection with manufacturing, marketing, promoting, using, selling, offering for sale, importing or distributing such deliverable (e.g., Product). Without limiting the foregoing, Magenta may use and disclose Bachem Intellectual Property to the extent necessary in connection with the prosecution, maintenance and enforcement of Magenta Developed Intellectual Property.

8.3 Magenta Data. All data, images, information, documents, records in whatever form obtained, developed, recorded or compiled (i) in connection with this Agreement or any Project Plan that relates to the Development Work or the Product, including, but not limited to, its development, manufacture or use, expressly excluding any Bachem Intellectual Property, or (ii) based upon or utilizing Magenta Confidential Information (collectively, "Magenta Data") are and shall remain the sole and exclusive property of Magenta, and will be gathered, stored, secured, managed and maintained by Bachem in accordance with Applicable Laws. Bachem agrees to take such further acts as may be requested by Magenta in order to evidence the foregoing. Promptly upon the expiration or termination of this Agreement or any Project Plan, and otherwise upon Magenta's request, Bachem will promptly provide originals or a copy (as applicable) of all Magenta Data to Magenta in a form acceptable to Magenta, and, to the extent that Magenta so requests. Availability of batch records shall be provided as set forth in Section 5.11. At Magenta's request, Bachem will destroy all remaining Magenta Data in Bachem's possession or under Bachem's control, so long as not in contravention of Applicable Laws. Bachem will not utilize Magenta Data for any purpose other than the performance of Services, and will cease use of any Magenta Data after expiration or termination of this Agreement. Notwithstanding anything herein to the contrary, Bachem may retain any Magenta Data in electronically stored archives that cannot be deleted, subject to Bachem's document retention policies and to the terms of confidentiality and non-use set forth in this Agreement.

8.4 Magenta's Developed Intellectual Property. Any invention (whether patentable or not), discoveries, improvements, works-of-authorship or other intellectual property made, conceived or reduced to practice by Bachem in connection with its performance under this Agreement or any Project Plan, which expressly excludes Bachem Intellectual Property ("Magenta Developed Intellectual Property"), shall be exclusively owned by Magenta. For the avoidance of doubt, Magenta Developed Intellectual Property includes Magenta Data. Bachem hereby assigns, and agrees to assign, to Magenta all of its right, title and interest to and in any Magenta Developed Intellectual Property, including all related intellectual property rights. Magenta grants to Bachem a limited, non-exclusive license to use any Magenta Developed Intellectual Property to manufacture and release the Product for Magenta in accordance with the terms and conditions of this Agreement and any applicable Project Plan.

8.5 Disclosure and Assignment. With respect to all Magenta Developed Intellectual Property, Bachem agrees (i) to disclose the same promptly to Magenta; (ii) to execute documents evidencing the rights of Magenta set forth in this Section 8; and (iii) upon the request of Magenta and at the sole expense, discretion and exclusive control of Magenta, to apply, or to assist and cooperate with Magenta in applying for, letters patent or like corresponding legal protection of any of the foregoing in the United States and all foreign countries (and for any extension, continuation, validation, reissue or renewal thereof). For that purpose, Bachem shall, and shall cause its employees and agents to, execute all papers necessary therefor, including assignments to Magenta or its nominee, without consideration, and also agrees without further consideration, but at Magenta's expense, to provide such information as may be required by Magenta and to assist Magenta, or its agents or designees, in the preparation and prosecution of any such patent application, the enforcement of any such resulting patent and the intellectual property protection of any such invention or discovery.

Section 9. CONFIDENTIALITY

9.1 Confidentiality Agreement. The Parties agree that the terms and provisions of this Agreement shall supersede all terms and provisions of that certain Confidentiality Agreement between the Parties dated February 9, 2016 (the "Confidentiality Agreement") and, as of the date hereof, the Confidentiality Agreement is hereby terminated and of no further force or effect.

9.2 Confidential Information. As of the Effective Date, the Parties agree to treat all Confidential Information (as described herein) acquired by either of them from the other under this Agreement as being secret and confidential, and each Party agrees that it shall not, at any time, without the express written consent of the other Party, disclose to any third party any Confidential Information. Each Party agrees that it shall use the other Party's Confidential Information solely to conduct the activities contemplated under this Agreement and for no other purpose. Confidential Information of a Party shall only be disclosed to the those employees, agents and Affiliates of the other Party who have a need to know such Confidential Information and only to the extent necessary in order to fulfill the relevant Party's obligations under this Agreement, who have been informed of the confidential nature of such information and who are obligated by written agreement to comply with confidentiality provisions no less restrictive than those set forth in this Agreement. Notwithstanding the foregoing, Magenta may disclose Confidential Information of Bachem relating to a Project Plan(s), Services, or the manufacture of Product to entities with whom Magenta has or may have a marketing and/or development collaboration or partnership and who have a specific need to know such Confidential Information and who are bound by written agreements which contain restrictions regarding disclosure and use of such Confidential Information no less restrictive than those set forth herein. Each Party further agrees to take such reasonable precautions as it normally takes with its own Confidential Information to prevent any unauthorized disclosure or use of such Confidential Information. For the purposes of this Agreement, "Confidential Information" shall mean all confidential or proprietary materials or information not generally available to the public that is confidential and proprietary to Magenta or Bachem (as the case may be). Magenta's Confidential Information includes, but is not limited to, Magenta Pre-Existing Intellectual Property, Magenta Developed Intellectual Property, confidential information provided to Bachem prior to the date hereof, all information regarding Magenta's materials, processes, know-how, formulations, analytical procedures, clinical procedures, its INDs and any other regulatory filings, other information related to the Product or any other product that may or will be under development by Magenta and any other technical or business information of Magenta (in each case, expressly excluding

Bachem Intellectual Property). Bachem's Confidential Information includes, but is not limited to, Bachem Intellectual Property, and all information regarding its business, customers, and price lists. As used in this Section 9, the Party in receipt of Confidential Information is the "Recipient" and the Party disclosing such information is the "Disclosing Party."

9.3 Exceptions. The provisions of Section 9.2 shall not apply to any information disclosed hereunder that:

(a) was known to Recipient prior to its date of disclosure by the Disclosing Party as evidenced by Recipient's written records;

(b) is disclosed lawfully to Recipient either before or after the date of the disclosure by the Disclosing Party, without an obligation of confidentiality by a Third Party rightfully in possession of such information;

(c) is published or generally known to the public, either before or after the date of disclosure by the Disclosing Party, through no act or omission on the part of Recipient;

(d) is independently developed by Recipient without reference to or in reliance upon the Confidential Information of the Disclosing Party; and

(e) is required to be disclosed by Recipient to comply with Applicable Laws, to defend or prosecute litigation, or to comply with governmental regulations; provided that Recipient provides prior written notice of such disclosure to the Disclosing Party and cooperates with the Disclosing Party to take reasonable and lawful actions to avoid and/or minimize the degree of such disclosure.

9.4 Return of Confidential Information. Upon request by the Disclosing Party, Recipient shall promptly return to the Disclosing Party the originals and all copies of any Confidential Information then in the Recipient's possession or under the Recipient's control. Notwithstanding the foregoing, the Recipient may retain one (1) copy of such Confidential Information for legal archival purposes, provided that such copy shall be kept confidential after the termination or expiration of this Agreement.

9.5 Handling and Reconstruction of and Access to Confidential Information. Bachem will establish and maintain rigorous safety and facility procedures, data security procedures and other safeguards against the destruction, loss, or alteration of Magenta's Confidential Information in the possession of Bachem. Bachem will be responsible for developing and maintaining procedures for the recovery and reconstruction of lost Confidential Information. Bachem will correct or remedy, at Magenta's request and sole discretion and at no charge to Magenta, any destruction, loss or alteration of any of Magenta's Confidential Information that occurs while such Confidential information is under the control of Bachem. Upon reasonable request by Magenta, Bachem will promptly retrieve any portion of Magenta's Confidential Information reasonably specified by Magenta. Magenta shall have the right to review and retain the entirety of, all computer or other files containing Magenta's Confidential Information. Bachem shall not withhold from Magenta any of Magenta's Confidential Information as a means of resolving a dispute.

9.6 Equitable Relief. In the event of a breach or threatened breach by a Party of any provision of Section 8 or 9 hereof, the other Party shall be authorized and entitled to obtain from any court of competent jurisdiction equitable relief, whether preliminary or permanent, including specific performance, in addition to any other rights or remedies to which such Party may be entitled in law or equity.

9.7 Survival. The obligations of confidentiality set forth in this Agreement shall survive its termination or expiration for a period of [***].

Section 10. INSURANCE

Bachem shall, during the Initial Term and any Renewal Terms, and [***] after the expiration of the last Product is delivered, obtain and maintain, at its own cost and expense and from a qualified insurance company, comprehensive general liability insurance including, but not limited to, contractual liability coverage and standard product liability coverage in an amount commensurate with industry standards. At Magenta's request, Bachem shall provide Magenta with proof of such coverage. Bachem shall provide, and shall cause its Affiliates and sublicensees who perform activities in connection with the manufacture of Product to provide, to Magenta, upon its reasonable request, a statement of coverages, amounts of insurance, and deductibles, and a copy of all policies including clauses within the policies that the insurance company has a duty to defend and indemnify.

Section 11. INDEMNIFICATION

11.1 By Magenta. Magenta agrees to indemnify, defend and hold harmless Bachem, its Affiliates, directors, officers, employees and agents from and against damages finally awarded or finally paid in settlement of any and all losses (including attorneys' fees and expenses), whether arising as a result of third party claims or a claim between the Parties ("Losses") arising out of or in connection with (i) the use or sale of the Product (ii) Magenta's labeling or improper handling and storage of Product, or (iii) any gross negligence, willful misconduct or misrepresentation by Magenta or material breach by Magenta of this Agreement, except to the extent that such Losses are attributable to the gross negligence or willful misconduct of or breach of this Agreement by Bachem.

11.2 By Bachem. Bachem shall indemnify, defend and hold harmless Magenta, its Affiliates, directors, officers, employees and agents from and against Losses arising out of or in connection with: (i) any Product that does not meet the Specifications, (ii) Bachem's labeling or improper manufacturing, handling, use or storage of a Product, (iii) any gross negligence, willful misconduct or misrepresentation by Bachem or material breach by Bachem of this Agreement, or (iv) any Latent Defects in a Product, except to the extent that such Losses are attributable to the gross negligence or willful misconduct of or breach of this Agreement by Magenta.

11.3 Limitation of Liability. NEITHER PARTY SHALL BE LIABLE, WHETHER BASED ON CONTRACT LAW, TORTS OR ANY OTHER AREA OF LAW, FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN ANY WAY RELATED TO THIS AGREEMENT OR ITS PERFORMANCE AND THE MAXIMUM TOTAL LIABILITY OF EITHER PARTY WHETHER BASED ON

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CONTRACT LAW, TORTS OR ANY OTHER AREA OF LAW SHALL BE LIMITED TO THE AMOUNT [***]. NOTWITHSTANDING THE FOREGOING, THESE LIMITATIONS SHALL NOT APPLY TO DAMAGES ARISING FROM A PARTY'S (I) INDEMNIFICATION OBLIGATIONS UNDER SECTION 11.1 OR SECTION 11.2 HEREOF, (II) GROSS NEGLIGENCE OR WILFUL MISCONDUCT, (III) BREACH OF ITS OBLIGATIONS UNDER SECTION 9 OR (IV) INFRINGEMENT OR MISAPPROPRIATION OF THE OTHER PARTY'S INTELLECTUAL PROPERTY.

Section 12. PUBLICITY AND PUBLICATIONS

Neither Magenta nor Bachem shall make any news release or other public statement, whether to the press or otherwise, disclosing the existence of this Agreement, the terms thereof or of any amendment thereto, or any Project Plan without the prior written approval of the other Party, except as required by Applicable Laws. To the extent, if any, that a Party concludes in good faith that it is required by Applicable Laws or regulations to file or register this Agreement or a notification thereof with any Governmental Authority, including the U.S. Securities and Exchange Commission, such Party may do so, and the other Party shall cooperate in such filing or notification and shall execute all documents reasonably required in connection therewith. In such situation, the filing Party shall request confidential treatment of sensitive provisions of the Agreement to the extent permitted by Applicable Laws. A Party may disclose this Agreement to a Third Party in connection with or in conjunction with a proposed merger, consolidation, sale of assets that include those related to this Agreement, an assignment of this Agreement or loan financing, raising of capital, or sale of securities; provided, however, that the disclosing Party obtains an agreement for confidential treatment thereof with a limitation on use solely for consideration of the relevant transaction.

Section 13. FORCE MAJEURE

If either Party shall be delayed or hindered in or prevented from the performance of any act required hereunder by reason of strike, lockouts, labor troubles, restrictive governmental or judicial orders or decrees, riots, insurrection, war, terrorist acts, acts of God, inclement weather or other reason or cause reasonably beyond such Party's control (each a "Force Majeure"), then performance of such act shall be excused for the period of such Force Majeure. The Party affected by the Force Majeure shall provide prompt written notice to the other Party of the commencement and termination of the Force Majeure. Should a Force Majeure continue for more than two (2) months, the Party unaffected by the Force Majeure may terminate this Agreement upon prior written notice to the affected Party. If the Force Majeure equally affects the ability of each Party to perform under this Agreement, then such termination shall only be by mutual written agreement.

Section 14. NOTICES

All notices or other communications that are required or permitted by this Agreement shall be in writing and shall be delivered personally, sent by fax (and promptly confirmed by overnight courier), sent by nationally recognized overnight courier, or sent by registered or certified mail, postage prepaid, return receipt requested, addressed as follows:

If to Magenta:

Magenta Therapeutics, Inc.
Attn: [***]
50 Hampshire Street
8th Floor Cambridge, MA 02139
[***]

If to Bachem:

Bachem Americas, Inc.
Attn: [***]
3132 Kashiwa Street, Torrance, CA 90505
[***]

All notices delivered pursuant to this Section 14 shall be considered delivered upon receipt by the intended recipient.

Section 15. MISCELLANEOUS

15.1 Further Actions. The Parties shall duly execute and deliver, or cause to be duly executed and delivered, such further instruments, and to do and cause to be done such further acts that may be necessary to carry out the provisions and purposes of this Agreement, notwithstanding any expiration or termination of this Agreement.

15.2 Amendments; Assignment. This Agreement, including any Project Plans or other attachments, may not be altered, amended or modified except by a written document signed by both Parties. Bachem will not assign this Agreement without the prior written consent of Magenta, and any purported assignment in contravention of this Section 15.2 shall be null and void; provided, however, that either Party may assign this Agreement in connection with (i) the sale, transfer or other disposition of its assets related to this Agreement, (ii) a change in control of such Party, or (iii) the sale or transfer of substantially all of such Party's outstanding stock.

15.3 Subcontracting. Bachem shall not assign, subcontract or delegate any of its rights or obligations under this Agreement without the express prior written authorization of Magenta, provided however, that Bachem may subcontract its rights and obligations hereunder to those subcontractors identified and agreed to by the Parties in the Quality Agreement. Bachem shall cause any such authorized subcontractor to be subject by contract to the same restrictions, exceptions, obligations, reports, termination provisions and other provisions contained in this Agreement and any applicable Project Plan(s). Bachem shall remain primarily obligated for all acts and omissions of any of its subcontractors as if Bachem had performed the subcontracted obligations itself, and shall guarantee the performance of the same.

15.4 Successors; Assigns. This Agreement shall be binding upon and inure to the benefit of the Parties hereto and each of their respective successors and permitted assigns.

15.5 Severability. All agreements and covenants contained herein are severable, and in the event any of them shall be held to be invalid by any competent court, this Agreement shall be interpreted as if such invalid agreements or covenants were not contained herein.

15.6 Entire Agreement. This Agreement, including the attached Project Plans, constitutes the entire agreement between the Parties related to the subject matter hereof, and supersedes all prior communications, representations, or agreements, either verbal or written, between the Parties. Each Party confirms that it is not relying on any representations or warranties of the other Party except as specifically set forth herein.

15.7 Independent Contractor. This Agreement shall not be deemed to create any partnership, joint venture, or agency relationship between the Parties. Each Party shall act hereunder as an independent contractor, and its agents and employees shall have no right or authority under this Agreement to assume or create any obligation on behalf of, or in the name of, the other Party. All persons employed by a Party shall be employees of such Party and not of the other Party, and all costs and obligations incurred by reason of any such employment shall be for the account and expense of such Party.

15.8 Waiver. The waiver by either Party of any right hereunder shall not be deemed a waiver of that same right in the future or a waiver of any other right hereunder.

15.9 Counterparts. This Agreement may be executed by original or facsimile signature in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute the same instrument.

15.10 Headings. The headings used in this Agreement are for convenience only and are not a part of this Agreement.

15.11 Governing Law. This Agreement will be construed and interpreted and its performance governed by the laws of the State of New York, without giving effect to its conflict of laws principles. The parties submit to the exclusive jurisdiction of the state and federal courts in New York for any suit, action or proceeding relating to this Agreement.

15.12 Dispute Resolution. The parties shall attempt in good faith to resolve any dispute arising out of or relating to this Agreement promptly by negotiations between executives who have authority to settle the controversy. Any party may give the other party written notice of any dispute not resolved in the normal course of business. Within [***] after delivery of said notice, executives of both parties shall meet at a mutually acceptable time and place in the State of New York or as otherwise agreed and thereafter as often as they reasonably deem necessary to exchange relevant information and to resolve the dispute. Once the executive of either party determines that additional meetings are not likely to resolve the dispute, each of the parties shall be entitled to terminate such meetings and the dispute shall be submitted to binding arbitration. The binding arbitration shall be in accordance with the rules and procedures for commercial arbitration of the American Arbitration Association. Unless the parties to such dispute agree otherwise in writing, any such arbitration shall be conducted in New York pursuant to New York law, without any consideration of conflict of law issues, and the results of such arbitration shall be final and binding on the parties and enforceable in any court of competent jurisdiction. Notwithstanding the foregoing, the parties acknowledge and agree that each of them shall have the right to seek immediate injunctive and other equitable relief through the courts in the event of any material breach by the other party of any provision of this Agreement that would cause the non-breaching party irreparable injury for which there would be no adequate remedy at law. Any such legal proceeding will be brought in the applicable state or federal court of the State of New York, and the parties hereby consent to this exclusive jurisdiction for this purpose.

* * * * *

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

IN WITNESS WHEREOF, each of the Parties hereto has caused this Master Development and Manufacturing Agreement to be executed by its duly authorized representative as of the Effective Date.

Magenta Therapeutics, Inc.

By: /s/ Christina Isacson
Name: Christina Isacson
Title: CBO

Bachem Americas, Inc.

By: /s/ Brian Gregs
Name: Brian Gregs
Title: COO

Acknowledged by Bachem AG

By: /s/ Beat Sax
Name: Beat Sax
Title: Site Manager

By: /s/ Boris Corpateaux
Name: Boris Corpateaux
Title: VP BD & Sales

APPENDIX A

List of Existing Project Plans

[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**
[***]	**[***]**

[Form of Amendment to Appendix A]

AMENDMENT TO APPENDIX A

This Amendment to Appendix A is dated as of [ ], 20[_], and made pursuant to Section 3.1 of the Master Development and Manufacturing Agreement (the "Master Agreement"), dated [ ] [ ], 20[ ], between Magenta Therapeutics, Inc. and Bachem Americas, Inc. In consideration of the mutual promises contained in the Master Agreement and for other good and valuable consideration, the receipt and adequacy of which each of the Parties does hereby acknowledge, the Parties hereby agree to amend Appendix A by adding the attached new Project Plan entitled [ ], which is designated as Project Plan A–[ ]. This Project Plan is effective as of [ ], 20[ ] and shall terminate on [ ], 20[ ], unless earlier terminated as permitted in the Master Agreement.

Project Plan A–[ ] shall hereby be deemed incorporated into the Master Agreement referenced above.

Magenta Therapeutics, Inc.

By: _____
Name:
Title:

Bachem Americas, Inc.

By: _____
Name:
Title:

APPENDIX B

[***]

[***]		[***]	**Date Added**
[***]	**[***]**		Effective Date
[***]	**[***]**		Effective Date
[***]	**[***]**		Effective Date

EXHIBIT 10.11

CONFIDENTIAL TREATMENT REQUESTED. INFORMATION FOR WHICH CONFIDENTIAL TREATMENT HAS BEEN REQUESTED IS OMITTED AND MARKED WITH "[***]". AN UNREDACTED VERSION OF THE DOCUMENT HAS ALSO BEEN FURNISHED SEPARATELY TO THE SECURITIES AND EXCHANGE COMMISSION AS REQUIRED BY RULE 406 UNDER THE SECURITIES ACT OF 1933, AS AMENDED.

EXCLUSIVE RESEARCH, DEVELOPMENT OPTION AND LICENSE AGREEMENT

This Agreement is entered into with effect as of the Effective Date (as defined below)

by and between

Magenta Therapeutics, Inc.,

with principal offices located at 50 Hampshire St., 8th floor, Cambridge, MA 02142, USA ("**MAGENTA**")

on the one hand

and

Heidelberg Pharma Research GmbH

with an office and place of business at Schriesheimer Strasse 101, D-68526 Ladenburg, Germany ("**HDPR**")

on the other hand.

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RECITALS

WHEREAS, HDPR controls proprietary technology and intellectual property relating to certain drug conjugation, payload and linker technology, as well as protein-drug conjugates; and

WHEREAS, MAGENTA controls proprietary technology and intellectual property relating to certain antibodies and antibody-like fragments; and

WHEREAS, MAGENTA and HDPR have performed mutually agreed research activities under the Evaluation Agreement concluded as of October 18, 2016, and amended as of June 7, 2017 and as of October 26, 2017; and

WHEREAS, MAGENTA wishes to have an exclusive option to research and develop for commercialization of Products (as defined below); and

WHEREAS, HDPR is willing to grant to MAGENTA such exclusive option under its intellectual property rights to make, use, offer for sale, sell and import and export such Products in the Territory for use in the Field (as such terms are respectively defined below), as contemplated herein;

NOW, THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto, intending to be legally bound, do hereby agree as follows:

1. Definitions. As used in this Agreement, the following terms, whether used in the singular or plural, shall have the following meanings:

1.1 Accounting Standards. The term "Accounting Standards" shall mean, with respect to a Party or its Sublicensees, US generally accepted accounting principles (GAAP), International Financial Reporting Standards (IFRS) or such other similar national standards as such Party or its Sublicensee adopts, in each case, consistently applied.

1.2 Affiliate. The term "Affiliate" shall mean any individual, corporation, association or other business entity that directly or indirectly controls, is controlled by, or is under common control with the Party in question. As used in this definition of "Affiliate," the term "control" shall mean the direct or indirect ownership of more than fifty percent (>50%) of the stock having the right to vote for directors thereof or the ability to otherwise control the management of the corporation or other business entity whether through the ownership of voting securities, by contract, resolution, regulation or otherwise.

1.3 Agreement. The term "Agreement" shall mean this document including any and all appendices and amendments to it as may be added and/or amended from time to time in accordance with the provisions of this Agreement.

1.4 Agreement Term. The term "Agreement Term" shall mean the period of time commencing on the Effective Date and, unless this Agreement is terminated sooner as provided in Section 18.2, expiring on the date when no royalty or other payment obligations under this Agreement are or will become due.

1.5 Amanitin. The term "Amanitin" shall mean [***].

1.6 Amanitin Toxin Constructs. The term "Amanitin Toxin Constructs" shall mean Amanitin, combined, where applicable, with a Linker(s).

1.7 Antibody. The term "Antibody" shall mean any antibody and any fragment thereof, including any protein or any fragments thereof and any non-protein based scaffold.

1.8 Applicable Law. The term "Applicable Law" shall mean all federal, state, local, national and supra-national laws, statutes, rules and regulations, including any rules, regulations, regulatory guidelines or other requirements of Regulatory Authorities, major national securities exchanges or major securities listing organizations, that may be in effect from time to time during the Agreement Term and applicable to a particular activity or country hereunder.

1.9 Blocked Target. The term "Blocked Target" shall mean a Target that has been entered into the list maintained by the Trusted Person and which Target HDPR cannot make available to MAGENTA due to the fact that either:

(a) [***]; or

(b) [***].

1.10 Business Day. The term "Business Day" shall mean a day other than a Saturday or Sunday on which banking institutions in Frankfurt A.M., Germany or New York, New York are open for business.

1.11 Calendar Quarter. The term "Calendar Quarter" shall mean the respective periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31.

1.12 Calendar Year. The term "Calendar Year" shall mean the period of time beginning on January 1 and ending December 31, except for the first year which shall begin on the Effective Date and end on December 31.

1.13 [***].

1.14 Change of Control. The term "Change of Control" shall mean (a) the sale of all or substantially all the assets of HDPR, (b) any merger, consolidation or acquisition of HDPR with, by or into another Person following which less than fifty percent (50%) of outstanding equity securities of the surviving entity or its ultimate parent entity of such transaction are held by Persons who were the holders of HDPR equity securities immediately prior to such transaction or (c) any change in the ownership of fifty percent (50%) or more of the voting capital stock of HDPR, with respect to (a)-(c), in one (1) or more related transactions.

1.15 Clinical Study. The term "Clinical Study" shall mean a Phase I, Phase II, Phase III Study, as applicable.

1.16 Combination Products. The term "Combination Product" shall mean (a) any single Product containing as active ingredients both a Compound and one or more other pharmaceutically active compounds or substances (whether co-formulated or co-packaged) for a single invoice price, (b) any Product sold in combination with one (1) or more other products (such as devices) or services for a single invoice price or (c) any Product sold where the sale of the Product is only available with the purchase of other products or services (such other pharmaceutically active compounds or substances, or such other products or services referred to in clauses (a) through (c) hereof, the "Other Components"). For purposes of this definition, "active ingredient" shall mean any pharmaceutically active compound or substance that is recognized by the FDA as an active ingredient in accordance with 21 CFR 210.3(b)(7).

1.17 Commercially Reasonable Efforts. The term "Commercially Reasonable Efforts" shall mean [***].

1.18 Compound. The term "Compound" shall mean an Antibody-drug conjugate directed at a Development Target, [***] (a) that is Covered by one (1) or more of the Patents Rights included in the HDPR IP Rights, HDPR IP Improvements or Joint IP Rights or (b) that is discovered, identified or developed through the use or application of HDPR Know-How.

1.19 Confidential Information. The term "Confidential Information" shall mean any and all non-public and proprietary information, data or Know-How, whether technical or non-technical, oral or written, that is disclosed by one Party or its Affiliates ("Disclosing Party") to the other Party or its Affiliates ("Receiving Party") in connection with this Agreement. Notwithstanding the foregoing, Confidential Information shall not include any information, data or Know-How that verifiably:

(a) was generally available to the public at the time of disclosure hereunder or becomes generally available to the public after disclosure hereunder, other than through fault (whether by action or inaction) or negligence of the Receiving Party or its Permitted Recipients as defined in Section 17.2.4;

(b) can be evidenced by the Receiving Party's written records to have been already known to the Receiving Party prior to its receipt from the Disclosing Party;

(c) is obtained at any time lawfully by the Receiving Party from a Third Party or, in case of MAGENTA, from a Sublicensee, under circumstances permitting its use or disclosure;

(d) is developed independently by the Receiving Party as evidenced by written records other than through knowledge of Confidential Information; or

(e) is approved in writing by the Disclosing Party for release by the Receiving Party.

The terms of this Agreement shall be considered Confidential Information of both Parties.

1.20 Control. The term "Control" shall mean, when used in reference to a Party and an item, intellectual property right or proprietary or trade secret information, the legal authority or right of such Party to grant the right to use such item or a license or sublicense of such intellectual property rights to the other Party, or to otherwise disclose such proprietary or trade secret information to the other Party, in each case, without breaching the terms of any agreement with a Third Party pursuant to which such rights, item or information were acquired or generated or misappropriating the proprietary or trade secret information or Know-How of a Third Party.

1.21 Cover. The term "Cover" shall mean (as a noun or as a verb including conjugations and variations such as "Covered," "Coverage" or "Covering") that the developing, making, using, offering for sale, promoting, selling, exporting or importing of a given intermediate, compound, formulation or product would infringe a Valid Claim in the absence of a license under or ownership of the Patent Rights to which such Valid Claim pertains. The determination of whether an intermediate, compound, formulation, process or product is Covered by a particular Valid Claim shall be made on a country-by-country basis.

1.22 Deductible Third Party Payments. The term "Deductible Third Party Payments" shall mean payments made by MAGENTA or its Sublicensees to Third Parties under licenses or sublicenses of intellectual property that are reasonably necessary in order for MAGENTA or its Sublicensees to use, make, have made, manufacture, sell, have sold or import Amanitin Toxin Constructs.

1.23 Development Target. The term "Development Target" shall mean an Exclusive Research Target for which MAGENTA has exercised the Development Option Right according to Section 3.4.

1.24 dievini Group. The term "dievini Group" shall mean the companies to which Hopp BioTech holding GmbH & Co. KG is an Affiliate.

1.25 Effective Date. The term "Effective Date" shall mean **March 1st, 2018.**

1.26 EU. The term "EU" shall mean the European Economic Area and all its then-current member countries.

1.27 Exclusive Research Target. The term "Exclusive Research Target" shall mean any Target for which MAGENTA has exercised the Exclusive Research Option Right according to Section 3.3, including the Initial Targets (as defined below).

1.28 FDA. The term "FDA" shall mean the Food and Drug Administration of the United States of America and any successor agency(ies) or authority having substantially the same function.

1.29 FDCA. The term "FDCA" shall mean the United States Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 301 et seq., as amended from time to time, together with any rules, regulations and requirements promulgated thereunder (including all additions, supplements, extensions, and modifications thereto).

1.30 Field. The term "Field" shall mean all therapeutic (including prophylactic) uses.

1.31 First Commercial Sale. The term "First Commercial Sale" shall mean, on a Product-by-Product and country-by-country basis, the first invoiced sale of a Product to a Third Party end user for monetary value by the MAGENTA Group following the receipt of any Regulatory Approval required for the sale of such Product in such country or, if no such Regulatory Approval is required, the date of the first invoiced sale of a Product to a Third Party end user for monetary value by the MAGENTA Group in a country. For clarity, sales prior to receipt of Regulatory Approval for a Product in a country, such as so-called "treatment IND sales," "named patient sales" and "compassionate use sales," will not be construed as a First Commercial Sale.

1.32 FTE. The term "FTE" shall mean the equivalent of the work of one (1) employee full time for one (1) Calendar Year in conducting Research Activities.

1.33 Good Manufacturing Practices or GMP. The term "Good Manufacturing Practices" or "GMP" means all Applicable Laws relating to manufacturing practices for products (including ingredients, testing, storage, handling, intermediates, bulk and finished products) promulgated by the FDA and any other Regulatory Authority (including, without limitation, EU or member state level) having jurisdiction over the manufacturing practices for products, including, but not limited to, standards in the form of Applicable Laws, guidelines, advisory opinions and compliance policy guides and current interpretations of the applicable authority or agency thereof (as applicable to pharmaceutical and biological products and ingredients), as the same may be updated, supplemented or amended from time to time.

1.34 Handle. The term "Handle" shall mean preparing, filing, prosecuting (including interference and opposition proceedings) and maintaining (including interferences, reissue, reexamination and opposition proceedings) of Patent Rights.

1.35 HDPR IP Improvements. The term "HDPR IP Improvements" shall mean any Improvements that are Covered by the Patent Rights included in the HDPR IP Rights or discovered, identified or developed through the use or application of the Know-How included in the HDPR IP Rights.

1.36 HDPR Intellectual Property Rights or HDPR IP Rights. The term "HDPR Intellectual Property Rights" or "HDPR IP Rights" shall mean the Patent Rights and Know-How that HDPR Controls on the Effective Date or during the Agreement Term that (a) are reasonably necessary or useful for the discovery, manufacture, development or commercialization of Compounds or Products, (b) relate to [***] or (c) relate to [***].

1.37 Improvements. The term "Improvements" shall mean all Know-How and Patent Rights generated by the Parties in connection with the Research Activities and which relate to the research, development or commercialization of Amanitin, an Amanitin Toxin Construct, a Linker, a Compound or a Product.

1.38 IND-Enabling Studies. The term "IND-Enabling Studies" shall mean GLP toxicology studies intended to support the filing of an application with Regulatory Authorities to initiate a Phase I Study on a molecule directed toward a Development Target selected by MAGENTA in its sole discretion.

1.39 Indication. The term "Indication" shall mean, with respect to a country, the labelled use of a Product for either therapeutic (including prophylactic) treatment or for the prevention of a distinct illness, sickness, interruption, cessation or disorder of a particular bodily function, system, tissue type or organ, or sign or symptom of any such items or conditions, regardless of the severity, frequency or route of any treatment, treatment regimen, dosage strength or patient class, for which Regulatory Approval has been obtained or is being sought in such country.

1.40 Initial Targets. The term "Initial Targets" shall mean the two Targets set forth on Schedule 1.40, which have already undergone the clearance procedure set forth in Section 3.3.3 prior to the Effective Date of this Agreement.

1.41 Initiation. The term "Initiation" shall mean (or as a verb including conjugations and variations) the date that the first human is first dosed with a Product in a Clinical Study approved of by the applicable Regulatory Authority.

1.42 Insolvency Event. The term "Insolvency Event" shall mean circumstances under which a Party (a) has a receiver or similar officer appointed over all or a material part of its assets or undertaking; (b) passes a resolution for winding-up (other than a winding-up for the purpose of, or in connection with, any solvent amalgamation or reconstruction) or a court makes an order to that effect or a court makes an order for administration (or any equivalent order in any jurisdiction); (c) enters into any composition or arrangement with its creditors (other than relating to a solvent restructuring); (d) ceases to carry on business; or (e) is unable to pay its debts as they become due in the ordinary course of business.

1.43 Know-How. The term "Know-How" shall mean all proprietary data, knowledge and information, including materials, samples, techniques, practices, methods, procedures, processes, chemical manufacturing data, toxicological data, pharmacological data, preclinical data, assays, platforms, formulations, specifications, quality control testing data and documentation thereof.

1.44 Linker. The term "Linker" shall mean [***].

1.45 MAGENTA Group. The term "MAGENTA Group" shall mean MAGENTA and its Sublicensees.

1.46 MAGENTA Intellectual Property Rights or MAGENTA IP Rights. The term "MAGENTA Intellectual Property Rights" or "MAGENTA IP Rights" shall mean all Patent Rights and Know-How Controlled by MAGENTA that are reasonably necessary or useful for HDPR to conduct its activities under the Research Plan.

1.47 Net Sales. The term "Net Sales" shall mean, in the case of sales by or for the benefit of MAGENTA Group (the "Seller") to independent, unrelated Third Party end users in bona fide arm's length transactions, the aggregate gross amount invoiced by Seller with respect to the Product, less the following deductions, in each case to the extent actually allowed and taken and not otherwise recovered by or reimbursed to Seller in connection with such Product:

(a) [***];

(b) [***];

(c) [***];

(d) [***];

(e) [***];

(f) [***]; and

(g) [***].

Notwithstanding anything to the contrary, [***].

In the case of any Combination Product sold in a country in the Territory, Net Sales for such Combination Product in such country shall be calculated by [***]. In the event the Parties are unable to agree on such value, then such disagreement shall be resolved in accordance with the dispute resolution procedures set forth in Section 19.2.

1.48 Non-Exclusive Research Target. The term "Non-Exclusive Research Target" shall mean all Targets on which the Parties will conduct Technology Research Activities.

1.49 Party. The term "Party" shall mean HDPR or MAGENTA, as the case may be, and "Parties" shall mean HDPR and MAGENTA, collectively.

1.50 Patent Rights. The term "Patent Rights" shall mean (a) issued patents and pending patent applications, including inventor's certificates, applications for inventor's certificates, statutory invention registrations, applications for statutory invention registrations, utility models and any foreign counterparts thereof, (b) any and all provisionals, non-provisionals, substitutions, continuations, continuations-in-part or divisionals or the patents or patent applications listed in subsection (a) or any other patent application claiming priority directly or indirectly to (i) any of the patents or patent applications in subsection (a) or (ii) any patent or patent application from which the patents or patent applications in subsection (a) claim direct or indirect priority, (c) all patents issuing on any of the foregoing in (a)-(b), (d) all foreign and other counterparts of any of the foregoing in (a)-(c), whether pending or issued, including any patent applications filed under the Patent Cooperation Treaty and (e) all other continuing applications, extensions or restorations by existing or future extension or restoration mechanisms, including patent term extension, supplementary protection certificates (or the equivalent), renewals, letters patent, reissues, reexaminations, extensions, confirmations, registrations and patents of addition on any of the foregoing in subsections (a)-(d).

1.51 Person. The term "Person" shall mean any individual, firm, corporation, partnership, limited liability company, trust, business trust, joint venture, governmental authority, association or other entity.

1.52 Phase I Study. The term "Phase I Study" shall mean a human clinical trial in any country that would satisfy the requirements of 21 C.F.R. § 312.21(a) (FDCA), as amended from time to time, and the foreign equivalents thereof.

1.53 Phase II Study. The term "Phase II Study" shall mean a human clinical trial for which the primary endpoints include a determination of dose ranges and/or a preliminary determination of efficacy in patients being studied as described in 21 C.F.R. § 312.21(b) FDCA, as amended from time to time, and the foreign equivalents thereof.

1.54 Phase III Study. The term "Phase III Study" shall mean a human clinical trial that is prospectively designed to demonstrate statistically whether a product is safe and effective for use in humans in a manner sufficient to obtain Regulatory Approval to market such product in patients having the disease or condition being studied as described in 21 C.F.R. § 312.21(c) FDCA, as amended from time to time, and the foreign equivalents thereof.

1.55 Product. The term "Product" shall mean all formulations of a product containing a Compound, including the use of a Compound by itself.

1.56 Regulatory Approval. The term "Regulatory Approval" shall mean, with respect to a country in the Territory, any approval (including pricing and reimbursement approvals, if applicable), license, registration or authorization of any Regulatory Authority necessary for the manufacture and sale of a Product in such country.

1.57 Regulatory Authority. The term "Regulatory Authority" shall mean any national, supranational (e.g., the European Commission, the Council of the European Union, the European Medicines Agency), regional, state or local regulatory agency, department, bureau, commission, council or other governmental entity including the FDA, in each country involved in the granting of Regulatory Approval for the Product.

1.58 Research Plan. The term "Research Plan" shall mean the plan of research attached as Appendix 1 and outlining the work, including Research Activities, to be performed by the Parties, and the additional information described in Section 2.1, as such plan may be updated from time to time pursuant to the terms of this Agreement.

1.59 Royalty Term. The term "Royalty Term" shall mean, with respect to a Product for a given country, the period of time commencing on the date of First Commercial Sale of such Product in such country and ending on the later of the date that is (a) [***] after the date of the First Commercial Sale of such Product in such country if no Valid Claim of the Patent Rights included in the HDPR IP Rights or Joint IP Rights in such country Covers the use, import, offering for sale or sale of the Product or (b) the expiration of the last to expire Valid Claim of the Patent Rights included in the HDPR IP Rights or Joint IP Rights Covering the use, import, offering for sale or sale of such Product in such country.

1.60 Target. The term "Target" means the molecular target (that is determined by specifying the amino acid sequence and/or the gene sequence of the corresponding antigen, including all fragments, mutations, and splice variants thereof and unique UniProtKB/Swiss Prat accession number) of a pharmacologically active drug compound.

1.61 Target Research Activities. The term "Target Research Activities" shall mean the activities undertaken by the Parties pursuant to the Research Plan with respect to identifying Compounds and developing Products directed towards the Exclusive Research Targets.

1.62 Target Research Term. The term "Target Research Term" shall mean, on an Exclusive Research Target-by-Exclusive Research Target basis, the period of time commencing on the date MAGENTA exercises its Exclusive Research Option Right and the Parties mutually agree on an amendment to the Research Plan with respect to an Exclusive Research Target and continuing until the earlier of (a) [***] thereafter or (b) [***]; provided that, the Target Research Term for the Initial Targets shall end upon the earlier of (i) the [***] or (ii) upon [***].

1.63 Technology Research Activities. The term "Technology Research Activities" shall mean the activities undertaken by the Parties pursuant to the Research Plan with respect to identifying Compounds and developing Products directed towards the Non-Exclusive Research Targets.

1.64 Territory. The term "Territory" shall mean all countries of the world.

1.65 Third Party. The term "Third Party" shall mean a Person or entity other than (a) HDPR or any of its Affiliates or (b) MAGENTA or its Affiliates or its Sublicensees.

1.66 Transfer. The term "Transfer" shall mean (as a noun or as a verb including conjugations and variations such as "Transferred" or "Transferring") that all necessary or useful relevant Know-How, whether or not documented, is made available to MAGENTA or its designee in a way that enables MAGENTA to implement such Know-How in its manufacturing and supply processes. For the avoidance of doubt, such Transfer is without prejudice to the ownership of HDPR IP Rights as set forth in Article 13.

1.67 Transplantation Indication Product. The term "Transplantation Indication Product" shall mean a Product approved for use for Indications that include hematopoietic stem cell transplant and that is not a Tumor Indication Product.

1.68 Tumor Indication Product. The term "Tumor Indication Product" shall mean a Product for therapeutic treatment of a distinct oncological illness, sickness, interruption, cessation or disorder of a particular bodily function, system, tissue type or organ, or sign or symptom of any such items or conditions, such as breast cancer, prostate cancer, colon cancer, gastric cancer, lung cancer, regardless of the severity, frequency or route of any treatment, treatment regimen, dosage strength or patient class, for which Regulatory Approval has been obtained or is being sought.

1.69 Trusted Person. The term "Trusted Person" shall mean [***].

1.70 US. The term "US" shall mean the United States of America and its territories and possessions.

1.71 USD. The term "USD" shall mean US Dollars.

1.72 Valid Claim. The term "Valid Claim" shall mean, as applicable, a claim in any (a) unexpired and issued Patent Rights that have not been disclaimed, revoked or held invalid by a final non-appealable decision of a court of competent jurisdiction or government agency or (b) a pending patent application that has not been finally abandoned, finally rejected or expired (after exhaustion of all appeals); provided, however, that if a claim of a pending patent application shall not have been issued within [***] after the earliest filing date from which such claim takes priority, such claim shall not constitute a Valid Claim for the purposes of this Agreement unless and until a patent issues with such claim.

1.73 Additional Definitions. Each of the following definitions is set forth in the Section of this Agreement indicated below:

Definition	**(Sub-) Section**
ADC Batch	6.1.1(c)
Bankruptcy Code	18.4.1
Breaching Party	18.2.1
Buy-Out Option	9.4.4
Buy-Out Option Exercise Notice	9.4.4
Buy-Out Option Exercise Fee	9.4.4
Competitive Infringement	13.6.2
Conjugation	6.1.1(c)
Contractor	3.8

Definition	(Sub-) Section
Development Milestone	9.2.3(a)
Development Option Fee	9.2.1
Development Option Right	3.4
Disclosing Party	1.19
Exclusive Research Option Right	3.2
Grant-Back License	3.6
GMP Full Manufacturing Process	6.2.1(c)
GMP Full Manufacturing Technology Transfer	6.2.1(c)
GMP Full Manufacturing Technology Transfer Agreement or GFMTTA	6.2.1(c)
HDPR	Cover Page
Indemnified Party	15.3
Indemnifying Party	15.3
Intellectual Property	18.4.1
Joint IP Rights	13.2.3
Joint Steering Committee	2.4.1
MAGENTA	Cover Page
MAGENTA IP Improvements	13.2.1
Non-Breaching Party	18.2.1
Non-GMP Full Manufacturing Process	6.1.2(b)
Non-GMP Full Manufacturing Technology Transfer	6.1.2(b)
Non-GMP Partial Manufacturing Process	6.1,1(c)(ii)
Non-GMP Partial Manufacturing Technology Transfer	6.1.1 (c)(ii)
Order	6.1.1(c)(i)
Other Components	1.16
Peremptory Notice Period	18.2.1
Permitted Recipients	17.2.4
Product Marks	13.4
Proposed Target	3.3.3
Publishing Notice	17.3(b)
Publishing Party	17.3(b)
Receiving Party	1.19
Reference License	7.2
Reference Purpose	7.2
Research Target Fee	9.1.2
Research Target Extension Fee	9.1.2
Royalty Rates	9.4.1
Sales Milestone	9.3.1
Seller	1.47
Sublicensee	3.7
Technology Fee	9.1.1
Technology Research Term	2.3.1
Trusted Person	1.69

2. Research Plan; Governance.

2.1 Research Plan. As more fully set forth herein, MAGENTA and HDPR shall conduct mutually agreed to Target Research Activities and Technology Research Activities (together referred to as the "Research Activities") pursuant to the Research Plan. The Research Plan will set forth (a) the Technology Research Activities and Target Research Activities to be conducted by the Parties, (b) the activities and specific objectives of the Parties in conducting such activities and (c) the anticipated budget necessary for conducting such activities.

2.2 Amendments to Research Plan.

2.2.1 Required Amendments. Within [***] of MAGENTA exercising its Exclusive Research Option Rights with respect to an Exclusive Research Target, the JSC will update the Research Plan to set forth the Target Research Activities to be conducted by the Parties in connection with such Exclusive Research Target, including the objectives, FTEs, other resources and anticipated budget required for such activities, including, as further detailed in Section 6.1.1, with respect to HDPR's supply obligations.

2.2.2 Other Amendments. Either Party may, through its representatives on the JSC, propose amendments to the Research Plan at any time, including with respect to the quantity or specifications of non-GMP quality Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin required to be manufactured and supplied by HDPR during the initial twelve (12) month period following the Effective Date and during any additional periods agreed to by the JSC pursuant to Section 2.4.3(d).

2.3 Duration.

2.3.1 Technology Research Activities. The Technology Research Activities shall commence on the Effective Date and will continue for a period of [***] thereafter (the "**Technology Research Term**"). MAGENTA will pay to HDPR the fee for the initial [***] period in accordance with Section 9.1.1 The Technology Research Term may be extended by MAGENTA, in its sole discretion, for additional [***] periods, up to a maximum total of [***] such extensions. If MAGENTA intends to extend the Technology Research Term for an additional [***], MAGENTA shall notify HDPR at least [***] prior to the expiration of the Technology Research Term (or the then-current [***] extension period) and pay to HDPR the fee for such extension in accordance with Section 9.1.1.

2.3.2 Target Research Activities. Target Research Activities shall commence, on an Exclusive Research Target-by-Exclusive Research Target basis, upon MAGENTAIs exercise of its Exclusive Research Option Right and the Parties mutually agreeing on an amendment to the Research Plan with respect to a Target (at which time, such Target shall be an Exclusive Research Target) and shall continue until the end of the Target Research Term for such Exclusive Research Target.

2.4 Joint Steering Committee.

2.4.1 Composition. Promptly after the Effective Date, the Parties will establish a joint steering committee ("**Joint Steering Committee**" or "**JSC**"), which will oversee the Research Activities and serve as a forum for coordination and communication between the Parties. The JSC will consist of [***], who each will have the appropriate expertise in product discovery, pre-clinical development, clinical development, regulatory and commercial matters to make decisions on behalf of the Parties with respect to the matters falling within the jurisdiction of the JSC. MAGENTA will select from its representatives the chairperson for the JSC. Each Party may change to its representatives on the JSC by written notice to the other Party, including, with respect to MAGENTA, the representative who will serve as chairperson. The JSC will have the right to adopt such standing rules as will be necessary for its work, to the extent that such rules are not inconsistent with this Agreement. From time to time, the JSC may establish one (1) or more sub-committees comprised of an equal number of representatives of each Party on an "as-needed" basis to oversee particular projects or activities (for example, joint project team, joint finance group or joint intellectual property group), which sub-committees shall (a) be subject to the oversight, review and approval of, and will report to, the JSC, (b) make decisions by consensus, with each Party's representatives on such sub-committee collectively having one (1) vote and (c) meet as frequently as prescribed by the JSC. If a sub-committee is unable to reach consensus with respect to an issue, then such issue shall be referred to the JSC for consideration and resolution. In no event will the authority of a sub-committee exceed that specified by the JSC for such sub-committee. All members of the JSC (and any sub-committee) shall be subject to written confidentiality obligations commensurate in scope to the provisions of Section 16.

2.4.2 Meetings, Procedural Rules and Minutes. The JSC shall meet in person, by teleconference or by videoconference at least quarterly, or with such other frequency as the Parties may mutually agree. The location of in-person JSC meetings will alternate between locations designated by HDPR and locations designated by MAGENTA. The chairperson of the JSC will be responsible for calling meetings on no less than fifteen (15) Business Days' notice, unless exigent circumstances require shorter notice. Each Party will make all proposals for agenda items and will provide all appropriate information with respect to such proposed items at least ten (10) Business Days in advance of the applicable meeting. Meetings of the JSC will be effective only if at least one (1) representative from each Party is present or participating in such meeting (at which time, a quorum will exist), and each Party shall use reasonable efforts to ensure that at least one (1) of its representatives attends each such meeting. The JSC will take action by consensus of the representatives present at a meeting at which a quorum exists, with each Party having a single vote irrespective of the number of representatives of such Party in attendance, and each Party will use good faith efforts to reach consensus on all issues presented to the JSC. With the prior consent of the other Party (not to be unreasonably withheld or delayed), other employees or consultants of either Party who are not representatives of such Party on the JSC (including a Party's Alliance Manager) may attend meetings of the JSC; provided that such attendees (a) will not vote in the decision-making process of the JSC and (b) are bound by obligations of confidentiality and non-disclosure. The JSC will designate an individual to prepare and circulate for review and approval of the Parties minutes of each meeting ten (10) Business Days after the meeting. The Parties will agree on the minutes of each meeting promptly, but in no event later than the next meeting of the JSC. Each Party will be responsible for all travel and related costs and expenses for its members and other representatives to attend meetings of, and otherwise participate on, the JSC or sub-committees. Each Party may replace its JSC representatives at any time by notice in writing to the other Party. The first meeting of the JSC shall be held within [***] after the Effective Date.

2.4.3 Responsibilities. The JSC shall be responsible for the following:

(a) overseeing the conduct of the Research Plan and Research Activities;

(b) providing a forum for consensual decision-making with respect to the Research Plan;

(c) preparing, updating or approving, as applicable, the Research Plan for each Exclusive Research Target pursuant to Section 2.2;

(d) preparing, updating or approving, as applicable, the Research Plan to specify the quantity and specifications of non-GMP quality Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin to be manufactured and supplied by HDPR pursuant to Section 6.1 during the initial [***] period following the Effective Date and after such period;

(e) monitoring the Parties' compliance with their respective obligations under the Research Plan;

(f) reviewing and circulating to the Parties any data, reports or other information submitted to the JSC by a Party that arises from such Party's Research Activities conducted pursuant to the Research Plan;

(g) pursuant to Section 2.2, reviewing and approving any proposed amendments to the Research Plan proposed by either Party, and evaluating any substantive departures by either Party from the Research Plan and the proposed resolution with respect to such departures;

(h) agreeing to [***];

(i) periodically reviewing and revising the specifications to which HDPR (or its Third Party designee) will manufacture and supply of Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin pursuant to Section 6.1.4;

(j) pursuant to Section 6.2, determining the Party, Third Party or Magenta Designee responsible for the manufacture and supply of GMP-quality Amanitin Toxin Constructs and Amanitin for GLP toxicology studies and all clinical development and commercial uses, and, if applicable pursuant to Section 6.2.1(a), determining the proposed terms and conditions by which HDPR will supply MAGENTA;

(k) providing a forum for the Parties to update each other on any Improvements; and

(l) making such other decisions as may be delegated to the JSC pursuant to the terms of this Agreement or by the mutual written Agreement of the Parties after the Effective Date.

2.4.4 Decision-Making; Limitations on Authority. If the JSC is unable to reach consensus on an issue presented at any JSC meeting or within a period of [***] thereafter, including with respect to any amendment to the Research Plan, then MAGENTA will have final decision-making authority with respect thereto; provided that MAGENTA may not, without the approval of the HDPR representatives on the JSC or HDPR's written consent, amend the Research Plan to impose on HDPR any new obligation to perform research activities if such new obligations (a) would require capabilities beyond the reasonable capabilities of HDPR that could not reasonably be subcontracted by HDPR to a Third Party or (b) would reasonably be expected to cause HDPR to incur additional FTE costs and direct out-of-pocket costs beyond those contemplated by this Agreement, unless MAGENTA has agreed in writing to reimburse HDPR for all such reasonable and documented additional costs that may be incurred by HDPR in performing such new obligation.

2.4.5 Alliance Managers. Each Party will appoint one (1) or more employee(s) of such Party who will oversee contact between the Parties for all matters between meetings of each JSC and will have such other responsibilities as the Parties may agree in writing after the Effective Date (each, an "**Alliance Manager**"). Each Party may replace its Alliance Manager at any time by notice in writing to the other Party.

3. Options and Licenses; Sublicensing.

3.1 Non-Exclusive Research License and Cross-License.

3.1.1 HDPR Grant. HDPR hereby grants to MAGENTA during the Technology Research Term a worldwide, non-exclusive and fee-bearing, right and license under the HDPR IP Rights and HDPR IP Improvements solely to enable MAGENTA to perform, or have performed on its behalf, Technology Research Activities on Non-Exclusive Research Targets, as more fully set forth in the Research Plan. Subject to Section 3.8, MAGENTA may sublicense the rights granted to it in this Section 3.1.1 to Contractors engaged by MAGENTA to perform Technology Research Activities on its behalf. In connection with the grant of such right and license for the Technology Research Term, MAGENTA will pay HDPR the Technology Fees as more fully set forth in Section 9.1.1.

3.1.2 Confidentiality. The identity of any Non-Exclusive Research Target on which MAGENTA (or its permitted Contractors) is conducting Technology Research Activities will not be disclosed to HDPR until MAGENTA chooses to exercise its Exclusive Research Option Right with respect to such Non-Exclusive Research Target in accordance with Section 3.3.

3.1.3 MAGENTA Grant. MAGENTA hereby grants to HDPR during the Technology Research Term a worldwide and non-exclusive right and license under the MAGENTA IP Rights and MAGENTA IP Improvements, without the right to transfer, assign or sublicense to a Third Party in any respects, solely to enable HDPR to perform those Technology Research Activities applicable to HDPR, as set forth in the Research Plan.

3.2 Option to Acquire an Exclusive Research License. During the Technology Research Term, HDPR hereby grants to MAGENTA the option to acquire an exclusive license under the HDPR IP Rights and HDPR IP Improvements with respect to [***] Targets (the "**Exclusive Research Option Right**"), which exclusive licenses would by granted on a Target-by-Target basis and enable MAGENTA to conduct Target Research Activities with respect to such Targets as more fully set forth in Section 3.3.4.

3.3 Exclusive Research Targets.

3.3.1 Initial Targets. The Exclusive Research Option Right is deemed exercised by MAGENTA for the Initial Targets as of the Effective Date. In connection with MAGENTA's exercise of its Exclusive Research Option Right for the Initial Targets, MAGENTA will pay HDPR the Research Target Fees as more fully set forth in Section 9.1.2.

3.3.2 Additional Targets. In connection with MAGENTA exercising its Exclusive Research Option Right for Targets other than the Initial Targets, MAGENTA shall follow the notification and selection procedures set forth in Section 3.3.3 with respect to such Targets (such Targets, once MAGENTA has exercised its Exclusive Research Option Right with respect thereto, together with the Initial Targets, the "**Exclusive Research Targets**"). In connection with MAGENTA's exercise of its Exclusive Research Option Right for such other Targets, MAGENTA will pay HDPR the Research Target Fees as more fully set forth in Section 9.1.2.

3.3.3 Selection of Exclusive Research Targets. HDPR will provide the Trusted Person with an up-to-date written list of all Blocked Targets. Before selecting a Target as an Exclusive Research Target, MAGENTA shall provide a confidential written notice to the Trusted Person proposing a Target (each, a "**Proposed Target**") to be designated as an Exclusive Research Target. The Trusted Person, after comparing the Proposed Target to the list of Blocked Targets, shall simultaneously notify MAGENTA and HDPR, in writing, whether the Proposed Target is a Blocked Target. If the Proposed Target is a Blocked Target, then (a) the Trusted Person shall not disclose the identity of the Proposed Target to HDPR, including in its written notice and (b) MAGENTA will not be deemed to have used one (1) of its Exclusive Research Option Rights with respect to such Target. If the Proposed Target is not a Blocked Target, then (i) the Trusted Person will disclose the identity of the Proposed Target in its written notice to the Parties, (ii) MAGENTA will be deemed to have used one (1) of its Exclusive Research Option Rights with respect to such Proposed Target, (iii) MAGENTA will pay the Research Target Fee as set forth in Section 9.1.2(a) and (iv) from and after the date of the Trusted Person's written notice, such Proposed Target shall constitute an Exclusive Research Target.

3.3.4 Exclusive Research License. Upon (a) the Effective Date, with respect to the Initial Targets and (b) receipt of the written notice from the Trusted Person pursuant to Section 3.3.3 that a Proposed Target is not a Blocked Target, with respect to each ((a)-(b)), HDPR hereby grants to MAGENTA, on an Exclusive Research Target-by-Exclusive Research Target basis, during the Target Research Term, an exclusive, worldwide, fee-bearing right and license under the HDPR IP Rights and HDPR IP Improvements to enable MAGENTA to perform, or have performed on its behalf, Target Research Activities on such Exclusive Research Target, as more fully set forth in the Research Plan. In connection with the grant of such right and license for the Target Research Term, MAGENTA will pay HDPR the Research Target Fees as more fully set forth in Section 9.1.2. For clarity, this exclusive license grant expressly includes the right for MAGENTA (and its Contractors) to conduct GLP toxicology studies. Subject to Section 3.8, MAGENTA may sublicense the rights granted to it in this Section 3.3.4 to Contractors engaged by MAGENTA to perform Target Research Activities on its or their behalf. Notwithstanding the foregoing, HDPR will retain the right to conduct, or have conducted on its behalf, on its own or together with Third Parties, internal and non-clinical research with respect to Exclusive Research Targets, as long as (a) such activities are not directed at research or production of GMP material and do not include GLP toxicity studies, (b) HDPR Controls any and all intellectual property, including Patent Rights and Know-How, arising in connection with such research that would constitute HDPR IP Rights but for the lack of such Control and (c) HDPR shall not, either directly or indirectly through Affiliates or Third Parties, publish or otherwise disclose any data, information, inventions (whether or not patentable) or intellectual property rights arising in connection with such research; provided that, subject to MAGENTA's prior written consent, HDPR may disclose such data, information, inventions (whether or not patentable) or intellectual property rights to bona fide potential investors that are bound by confidentiality obligations at least as restrictive as those set forth in this Agreement.

3.3.5 Termination. If MAGENTA terminates its exclusive license for an Exclusive Research Target pursuant to Section 18.2.1 or Section 18.2.3, then, from and after the effective date of such termination, such Exclusive Research Target shall be deemed a Non-Exclusive Research Target for which MAGENTA maintains a non-exclusive license pursuant to Section 3.1.1 [***].

3.4 Option to Acquire Development Rights. On an Exclusive Research Target-by-Exclusive Research Target basis, during the Target Research Term for an Exclusive Research Target, HDPR hereby grants to MAGENTA the option to obtain an exclusive development and commercial license with respect to such Exclusive Research Target (the "**Development Option Right**"). MAGENTA may exercise its Development Option Right for any Exclusive Research Target by notifying HDPR in writing of the identity of the Exclusive Research Target for which MAGENTA wishes to exercise its Development Option Right and paying HDPR the Development Option Fee as more fully set forth in Section 9.2.1. Upon HDPR's receipt of such notice, such Exclusive Research Target shall be a Development Target for purposes of this Agreement.

3.5 Exclusive Commercial License. Upon MAGENTA's exercise of its Development Option Right with respect to an Exclusive Research Target pursuant to Section 3.4 and payment of the Development Option Fee as set forth in Section 9.2.1, at which time such Exclusive Research Target shall become a Development Target, HDPR hereby grants to MAGENTA, with respect to such Development Target, an exclusive, worldwide, royalty-bearing, freely transferable and sublicensable (through multiple tiers) right and license under the HDPR IP Rights and HDPR IP Improvements to develop, have developed, register, have registered, use, have used, make, have made, import, have imported, export, have exported, market, have marketed, distribute, have distributed, sell and have sold Products in the Field in the Territory directed toward such Development Target. Notwithstanding the foregoing, HDPR will retain the right to conduct, or have conducted on its behalf, on its own or together with Third Parties, internal and non-clinical research with respect to Development Targets, as long as (a) such activities are not directed at research or production of GMP material and do not include GLP toxicity studies, (b) HDPR Controls any and all intellectual property, including Patent Rights and Know-How, arising in connection with such research that would constitute HDPR IP Rights but for the lack of such Control and (c) HDPR shall not, either directly or indirectly through Affiliates or Third Parties, publish or otherwise disclose any data, information, inventions (whether or not patentable) or intellectual property rights arising in connection with such research; provided that, subject to MAGENTA's prior written consent, HDPR may disclose such data, information, inventions (whether or not patentable) or intellectual property rights to bona fide potential investors that are bound by confidentiality obligations at least as restrictive as those set forth in this Agreement.

3.6 Grant-Back License. MAGENTA hereby grants to HDPR a worldwide, royalty-free and non-exclusive license under its interest in Joint IP Rights, for non-clinical research purposes only, with the right to sublicense Third Parties to do the same, ("**Grant-Back License**"). For the avoidance of doubt, HDPR is prohibited from using the rights or licenses granted under the Grant-Back License for the clinical development or commercialization of compounds or products.

3.7 Sublicensing. MAGENTA will have the right to grant sublicenses, through multiple tiers, under the rights granted to it in Sections 3.5 and *72,* to its Affiliates and to Third Parties (each, a "**Sublicensee**") (for clarity, each Third Party to which a sublicense is granted according to this Section 3.7 ceases to be a Third Party and becomes a Sublicensee); provided that:

3.7.1 any such sublicenses will be granted pursuant to a written agreement that is consistent with the terms and conditions of this Agreement;

3.7.2 MAGENTA shall remain liable for any breach by a Sublicensee would constitute a breach of this Agreement; and

3.7.3 any such sublicenses of the rights granted to MAGENTA under Section 3.5 will terminate automatically upon termination of this Agreement with respect to the sublicensed rights; provided that such sublicense shall not terminate if, as of the effective date of such termination, the Sublicensee is not in material breach of its obligations to MAGENTA under its sublicense agreement, the Sublicensee was previously granted an exclusive sublicense to develop or commercialize one (1) or more Products and, within [***] of such termination, the Sublicensee agrees in writing to be bound directly to HDPR under a license agreement substantially similar to this Agreement with respect to the rights sublicensed hereunder, substituting such Sublicensee for MAGENTA; and provided, further, that (a) such license agreement shall not prejudice any remedy either Party may have against the other in connection with such termination of this Agreement (in whole or in part); (b) the scope of the rights granted to the Sublicensee under such license agreement (with respect to licensed activities, Products and territory) shall be equal to the scope of the rights that had been sublicensed by MAGENTA to the Sublicensee pursuant to the sublicense agreement; (c) MAGENTA shall no longer be obligated under this Agreement to pay amounts set forth in this Agreement, to the extent such amounts are payable based on the activities of such Sublicensee from and after the effective date of such termination; (d) such license agreement shall obligate the Sublicensee to pay directly to HDPR amounts corresponding to those set forth in Section 9 which are payable based on the activities of such Sublicensee from and after the effective date of such termination; and (e) such license agreement shall not modify the rights and obligations of the Parties following any termination of this Agreement, in whole or in part.

3.8 Contractors. MAGENTA will have the right to subcontract any of its activities under this Agreement to a Third Party or to a Sublicensee, including a contractor or contract research organization (each such Third Party or Sublicensee, as applicable, a "**Contractor**"); provided that it obtains a written undertaking from the Contractor that it will be subject to the confidentiality provisions of Section 17 and that MAGENTA and its Affiliates, as applicable, shall remain liable for any breach by a Contractor, in particular for those that would constitute a material breach of this Agreement.

4. Diligence Requirements.

4.1.1 Obligation. MAGENTA and HDPR shall use Commercially Reasonable Efforts to perform all Research Activities assigned to it under the Research Plan. If MAGENTA exercises its Development Option Right with respect to an Exclusive Research Target (at which time, such Exclusive Research Target will be a Development Target), then MAGENTA agrees to use Commercially Reasonable Efforts to pursue development and commercialization of a Product directed toward the applicable Development Target in the Field in the Territory.

4.1.2 Performance Through Sublicensees and Contractors. Where provisions of this Agreement provide that MAGENTA is responsible for a matter or activity, including Research Activities or the use of Commercially Reasonable Efforts, it is understood that such responsibilities and efforts may be carried out or borne on MAGENTA's behalf by its Sublicensees or Contractors.

5. Development. MAGENTA, at its sole cost, shall be responsible for pursuing preclinical and clinical development, Regulatory Approval and marketing of Products in the Territory; provided that HDPR shall be responsible for the costs associated with its Research Activities. For the avoidance of doubt, nothing in this Article 5 shall limit MAGENTA's payment obligations set forth in Section 6.1.1.

6. Supply of Compounds and Products; Technology Transfer.

6.1 Pre-Clinical Supply. The provisions set forth in this Section 6.1, including its subsections, relate exclusively to the manufacture of non-GMP quality Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin.

6.1.1 Obligation to Supply.

(a) General. Subject to the remainder of this Article 6, HDPR, either itself or through its engagement of contractors, will manufacture and supply MAGENTA with quantities of Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin, as requested by MAGENTA and set forth in the Research Plan, sufficient for MAGENTA to perform its pre-clinical development activities set forth in the Research Plan, including any pre-clinical Research Activities. For this purpose, and as more fully set forth in the Research Plan, HDPR will manufacture and deliver to MAGENTA up to 1g of Amanitin Toxin Construct during the twelve (12) month period immediately following the Effective Date, which could include one (1) or more Linkers or toxins, as specified in the Research Plan.

(b) Fees. Subject to Section 6.1.1(c), in connection with HDPR's manufacture and supply of Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin as more fully set forth in Section 6.1.1(a), except for [***], MAGENTA shall pay HDPR a flat rate of [***] for such supply during the [***] period immediately following the Effective Date, plus the reasonable and documented out-of-pocket costs of materials used by HDPR in connection with the manufacture and supply of building blocks for Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin, which costs will not exceed an aggregate amount of [***]. For the avoidance of doubt, if the JSC should decide that, for reasons of time, [***] shall be performed by HDPR internally, the cost for its production will be set forth separately, but will in no case exceed the aggregate amount for external costs [***] set forth above. In no event will the aggregate amount paid by MAGENTA pursuant to this Section 6.1.1 (b) during the first [***] period immediately following the Effective Date exceed [***], unless MAGENTA requests that HDPR manufacture and deliver more than 1g of Amanitin Toxin Construct during the [***] period immediately following the Effective Date. MAGENTA will make such payment to HDPR within [***] of its receipt of an invoice from HDPR therefor, which invoice will be sent within [***] of the Effective Date.

(c) Supply of Antibody-drug Conjugate Material. With regard to the conjugation of the Amanitin Toxin Constructs to the Antibody to create Antibody-drug conjugate material (such process, the "**Conjugation**" and conducting such process "**Conjugating**"), MAGENTA will decide, at its own discretion, for each batch of Antibody-drug conjugate material (each such batch, an "**ADC Batch**"), between the following options:

(i) Performance by HDPR. If MAGENTA elects for HDPR to Conjugate an ADC Batch, then MAGENTA will notify HDPR of such election in writing, which writing and any subsequent writing pursuant to which MAGENTA requests additional Antibody-drug conjugate material, will also set forth the amount of Antibody-drug conjugate material that MAGENTA requires in connection with each such ADC Batch (such amount not to exceed [***] per ADC Batch) and the requested delivery date for each such ADC Batch, which will not be sooner than [***] from the date of each such writing (each such writing, an "Order"). HDPR will promptly notify MAGENTA in writing of the amount of Antibody that HDPR requires to Conjugate the requested amount of Antibody-drug conjugate material for such

ADC Batch and the date by which HDPR must receive such Antibody in order for HDPR to meet MAGENTA's requested delivery date as set forth in the Order, and MAGENTA will be responsible for [***]. HDPR will Conjugate the ADC Batch to the requested amount of Antibody-drug conjugate material and deliver such material to MAGENTA via World Courier (DDP, Incoterms 2010) no later than the requested delivery date (or such later date agreed to by the Parties pursuant to the proviso in the immediately preceding sentence). MAGENTA will make a onetime payment of [***] for each ADC Batch.

(ii) Performance by MAGENTA. If MAGENTA decides to Conjugate or have Conjugated ADC Batches itself, then MAGENTA will notify HDPR of such election in writing and HDPR will promptly (1) effect a Transfer to MAGENTA or its Designee all HDPR Know-How necessary to conduct Conjugation, including all associated methods, standards and processes, including with respect to the HDPR Know-How set forth on Schedule 6.1.1(c)(ii) hereto (the "**Non-GMP Partial Manufacturing Process**") and (2) provide MAGENTA or its designee with reasonable assistance in implementing the Non-GMP Partial Manufacturing Process at facilities designated by MAGENTA or its designee (such Transfer and implementation assistance, the "**Non-GMP Partial Manufacturing Technology Transfer**"). As reimbursement for the Non-GMP Partial Manufacturing Technology Transfer, MAGENTA will pay HDPR a one-time fee of [***] after successful completion of the Non-GMP Partial Manufacturing Technology Transfer to MAGENTA. MAGENTA may only use the Non-GMP Partial Manufacturing Process for the sole purpose of researching, developing, manufacturing and commercializing Compounds and Products.

(d) Supply of Amanitin Toxin Constructs and Amanitin. Notwithstanding anything to the contrary in Section 6.1.1(a), and in addition to the manufacturing and supply obligations set forth in Sections 6.1.1(a)-(c), if MAGENTA desires that HDPR manufacture and supply MAGENTA with more than [***] of Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin, then the JSC may request, from time to time during the Agreement Term, pursuant to a written order issued to HDPR, that HDPR supply MAGENTA with such additional supply of Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin and, in such event, HDPR will deliver to the JSC a written proposal setting forth the costs of such additional supply. The JSC will determine whether or not to accept HDPR's proposal. If the proposal is accepted by the JSC, then HDPR will deliver to MAGENTA the requested amount of Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin within the corresponding timeline set forth by the JSC. The costs of such additional Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin shall be priced according to the Service Cost List attached hereto as Appendix 2, which will be agreed to by the Parties in good faith following the Effective Date and, once agreed to, appended to this Agreement.

6.1.2 Inability to Supply.

(a) Should HDPR become aware of facts or circumstances that make it reasonably likely that HDPR will be unable to supply MAGENTA with quantities of Antibody-drug conjugate material sufficient for MAGENTA to perform its pre-clinical development activities set forth in the Research Plan, including any pre-clinical Research Activities, then HDPR will promptly notify MAGENTA in writing that it is reasonably likely that HDPR will be unable to satisfy its supply obligations as set forth in Section 6.1.1, and the Parties will discuss, for a period not to exceed [***], whether to amend HDPR's supply obligation so that HDPR is only responsible for supplying MAGENTA with Amanitin Toxin Constructs. In the event that the Parties agree, pursuant to this Section 6.1.2, that HDPR will only be responsible for supplying MAGENTA with Amanitin Toxin Constructs as aforesaid, then HDPR will effect the Non-GMP Partial Manufacturing Technology Transfer as set forth in Section 6.1.1(c)(ii) to MAGENTA or its Designee and MAGENTA will pay HDPR a one-time fee of [***], unless HDPR's inability to supply was primarily caused by factors within its control, in which case MAGENTA will not pay any fee to HDPR for the Non-GMP Partial Manufacturing Technology Transfer. In the event the Parties dispute, in good faith, whether an event or circumstance was within HDPR's control, such dispute will be resolved in accordance with Section 19.2.

(b) Should HDPR become aware of facts or circumstances that make it reasonable likely that HDPR will be unable to supply MAGENTA with quantities of Amanitin Toxin Constructs, Amanitin or Antibody-drug conjugate material sufficient for MAGENTA to perform its pre-clinical development activities set forth in the Research Plan, then HDPR will promptly notify MAGENTA in writing that it is reasonably likely that HDPR will be unable to satisfy its supply obligations as set forth in Section 6.1.1, and MAGENTA may elect, in its sole discretion, for HDPR to promptly (i) effect a Transfer to MAGENTA or its Designee of all HDPR Know-How necessary for the (i) Non-GMP Partial Manufacturing Process and (ii) then-current process for the manufacture of Amanitin Toxin Constructs and Amanitin, including all associated methods, standards and processes, including with respect to the HDPR Know-How set forth on Schedule 6.1.2(b) hereto ((i)-(ii) collectively, the "**Non-GMP Full Manufacturing Process**") and (iii) provide MAGENTA with reasonable assistance requested by MAGENTA or its Designee to implement the Non-GMP Full Manufacturing Process at facilities designated by MAGENTA or its designee (such Transfer and implementation assistance, as more fully described herein, the "**Non-GMP Full Manufacturing Technology Transfer**"). If MAGENTA elects, pursuant to this Section 6.1.2, to cause a Non-GMP Full Manufacturing Technology Transfer, then MAGENTA will pay HDPR a one-time fee of [***] upon successful completion of the Non-GMP Full Manufacturing Technology Transfer to MAGENTA, unless HDPR's inability to supply was primarily caused by factors within its control, in which case MAGENTA will not pay any fee to HDPR for the Non-GMP Full Manufacturing Technology Transfer. In the event the Parties dispute, in good faith, whether an event or circumstance was within HDPR's control, such dispute will be resolved in accordance with Section 19.2. MAGENTA may only use the Non-GMP Full Manufacturing Process for the sole purpose of researching, developing, manufacturing and commercializing Compounds and Products.

6.1.3 Further Assistance. In connection with a Non-GMP Partial Manufacturing Technology Transfer or Non-GMP Full Manufacturing Technology Transfer, HDPR shall:

(a) make available, and will use reasonable efforts to cause its Third Party manufacturers to make available, to MAGENTA (or its Designee, as applicable) from time to time as MAGENTA may request, all manufacturing-related Know-How and materials directly relating to the Non-GMP Partial Manufacturing Process or Non-GMP Full Manufacturing Process, as

applicable, and all documentation constituting material support, performance advice, shop practice, standard operating procedures, specifications as to materials to be used and control methods, that are necessary to enable MAGENTA (or its Designee, as applicable) to use and practice the Non-GMP Partial Manufacturing Process or Non-GMP Full Manufacturing Process, as applicable;

(b) cause all appropriate employees and representatives of HDPR and its Affiliates to meet with, and will use reasonable efforts to cause specified employees of its Third Party manufacturers to meet with, employees or representatives of MAGENTA (or its Designee, as applicable) at the applicable manufacturing facility at mutually convenient times to assist with the training of the personnel of MAGENTA (or its Designee, as applicable) to the extent reasonably necessary to enable MAGENTA (or its Designee, as applicable) to use and practice the Non-GMP Partial Manufacturing Process or Non-GMP Full Manufacturing Process, as applicable; and

(c) take such steps, and will use reasonable efforts to cause its Third Party manufacturers to take such steps, as are reasonably necessary to assist MAGENTA (or its Designee, as applicable) in obtaining any necessary licenses, permits or approvals from Regulatory Authorities with respect to the (i) Conjugation of Antibody-drug conjugate material, with respect to a Non-GMP Partial Manufacturing Technology Transfer and (ii) Conjugation of Antibody-drug conjugate material and manufacture of Amanitin Toxin Constructs or Amanitin, with respect to a Non-GMP Full Manufacturing Technology Transfer, with respect to each ((i)-(ii)), at the applicable facilities.

6.1.4 Pre-Clinical Supply Terms and Conditions. The terms set forth in Schedule 6.1.4 will apply to HDPR's or its Third Party designee's supply of Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin to MAGENTA pursuant to Section 6.1.1.

6.2 Clinical and Commercial Supply. The provisions set forth in this Section 6.2, including its subsections, relate exclusively to the manufacture and supply of GMP-quality Amanitin Toxin Constructs and Amanitin.

6.2.1 JSC Decision. The JSC shall be responsible for determining the Party, Affiliate, Sublicensee or Third Party responsible for the manufacture and supply of GMP-quality Amanitin Toxin Constructs and Amanitin for GLP toxicology studies and all clinical development and commercial uses. For the avoidance of doubt, Amanitin Toxin Constructs and Amanitin that is suitable for use in GLP toxicology studies will be considered GMP-quality material under this Agreement. In making such decision, the JSC will consider all relevant factors, including applicable GMP requirements and delivery timing, and, based on such considerations, will choose from one (1) of the following options:

(a) HDPR, through its existing relationship with [***] (or any successor Third Party engaged by HDPR), will manufacture and supply MAGENTA with Amanitin Toxin Constructs and Amanitin for the production of Antibody-drug conjugate material for GLP toxicology studies and all clinical development and commercial uses; provided that (a) this option may only be selected during the first [***] period following the Effective Date, (b) the Parties will in good faith establish the terms and conditions of a definitive written agreement by which HDPR will supply MAGENTA and (c) the Parties, pursuant to Section 6.3, enter into an appropriate quality agreement;

(b) [***], or its successor, will directly supply MAGENTA with Amanitin Toxin Constructs and Amanitin for the production of Antibody-drug conjugate material for the performance of GLP toxicology studies and all clinical development and commercial uses; provided that the JSC may only select this option if HDPR and [***] or its successor have executed a mutually acceptable agreement allowing [***] or its successor to directly supply MAGENTA as aforesaid; or

(c) If MAGENTA has exercised its Development Option Right for at least one (1) Exclusive Research Target, then the JSC may elect for HDPR to effect a Transfer to MAGENTA or its designee (which designee may be a MAGENTA Affiliate, a Sublicensee or a Third Party manufacturer, hereafter the "**Designee**") of all Know-How Controlled by HDPR or [***], or its successor, as applicable, that is necessary for the then-current process for the manufacture of Amanitin Toxin Constructs and Amanitin in GMP-quality, including all associated methods, standards and processes, including with respect to the HDPR or [***] (or its successor) Know-How set forth on Schedule 6.2.1(c) (the "**GMP Full Manufacturing Process**"). In such event, HDPR will provide MAGENTA with reasonable assistance requested by MAGENTA or its Designee to implement the GMP Full Manufacturing Process at facilities designated by MAGENTA or its designee (such Transfer and implementation assistance, as more fully described herein, the "**GMP Full Manufacturing Technology Transfer**"). The Parties will negotiate in good faith an agreement for the GMP Full Manufacturing Technology Transfer (such agreement, the "**GMP Full Manufacturing Technology Transfer Agreement**" or "**GFMTTA**"), setting forth the fees to be paid by MAGENTA to HDPR as a compensation for the GMP Full Manufacturing Technology Transfer. The Parties envisage the conclusion of the GFMTTA by [***]. If the Parties are unable to agree on the terms of the GFMTTA before this date, then the Parties will continue negotiations on the terms of the GFMTTA and, in parallel, the Parties will initiate the GMP Full Manufacturing Technology Transfer upon MAGENTA's request for the duration of three (3) months against payment of an initiation fee of [***] by MAGENTA, [***]. After completion of the GMP Full Manufacturing Technology Transfer, MAGENTA, either itself or through a Contractor, will be responsible for the manufacture and supply Amanitin Toxin Constructs and Amanitin for GLP toxicology studies and all clinical development and commercial uses. MAGENTA or its Designee may only use the GMP Full Manufacturing Process for the sole purpose of researching, developing, manufacturing and commercializing Compounds and Products.

6.3 Quality Agreement. If, pursuant to Section 6.2.1(a), the JSC selects HDPR to be responsible for manufacturing and supplying MAGENTA with GMP-quality Amanitin Toxin Constructs or Amanitin for GLP toxicology studies or clinical development and commercial uses, then the Parties will enter into a mutually acceptable quality agreement with respect to such manufacture and supply no later than [***] before HDPR starts manufacturing and supplying the first batch of Amanitin Toxin Constructs and Amanitin for the production of Antibody-drug conjugate material for such uses.

7. Regulatory.

7.1 Decision-Making. MAGENTA, at its sole cost and acting in its sole discretion, shall be responsible for all regulatory affairs related to Products in the Territory, including the preparation and filing of applications for Regulatory Approval therefor, as well as any or all governmental approvals required to develop, have developed, make, have made, use, have used, manufacture, have manufactured, import, have imported, sell and have sold Products in a country in the Territory. MAGENTA shall be responsible for pursuing, compiling and submitting all regulatory filing documentation for, and interacting with Regulatory Authorities in connection with,

all Products in all countries in the Territory. MAGENTA or its Sublicensees shall own and file in their discretion all regulatory filings and Regulatory Approvals for all Products in all countries of the Territory. MAGENTA, at its sole cost, shall report to appropriate authorities, in accordance with Applicable Law, all adverse events related to use of the Products in the Territory.

7.2 Right of Reference. HDPR hereby grants MAGENTA a license and right of reference, as may be necessary (both together hereafter referred to as "**Reference License**"), with respect to the CMC and manufacturing components of the Regulatory Approvals, investigational new drug applications and other regulatory data or documentation (including drug master files) relating to Amanitin Toxin Constructs that HDPR or its Affiliates may Control, with the right to grant sublicenses and further rights of reference in accordance with Section 3.7, for the purpose of developing, having developed, making, having made, using, having used, manufacturing, having manufactured, importing, having imported, selling and having sold Compounds and Products in the Field in the Territory (the "**Reference Purpose**"). The Reference License shall be exclusive with respect to the Reference Purpose. HDPR shall execute any documentation reasonably requested by MAGENTA to effect such right of reference and shall use commercially reasonable efforts to cause its Third Party contract manufacturers to grant such right of reference and execute such documentation. In furtherance of the foregoing, in the event HDPR or [***] (or its successors) is supplying MAGENTA with GMP-quality Amanitin Toxin Constructs or Amanitin pursuant to Sections 6.2.1(a) or 6.2.1(b), HDPR will (a) assist MAGENTA in connection with understanding HDPR's or [***] (or its successor's) then-current contract manufacturing process, including using commercially reasonable efforts to secure for MAGENTA the ability to visit and inspect the facilities of HDPR's Third Party contractor manufacturers, including [***] (and its successors); and (b) assist MAGENTA in responding to, and use commercially reasonable efforts to cause its Third Party contract manufacturers, including [***] (and its successors) to assist MAGENTA in responding to, questions from Regulatory Authorities with respect to any regulatory filings or submissions made by MAGENTA that reference HDPR's or its Third Party contractor manufacturers' (including [***] and its successors) Regulatory Approvals or other regulatory data or documentation, including investigational new drug applications, drug master files and biologies master files. In connection with the foregoing, the JSC will decide whether the Parties should enter into a formal agreement memorializing the Parties' rights and obligations with respect to the foregoing Know-How Transfer, including the resources required for such Transfer. If the JSC decides that such a formal agreement should be executed, then the Parties will have [***] to execute such formal agreement. If the Parties are unable to execute such formal agreement within such [***] period, then the matter will be resolved pursuant to Section 19.2.

8. Commercialization. MAGENTA, at its own expense, shall have sole responsibility and decision-making authority for the marketing, promotion, sale and distribution of Products in the Territory.

9. Payments.

9.1 Research and Manufacturing Payments.

9.1.1 Technology Fee. Within [***] of Effective Date, in consideration of the non-exclusive license grant set forth in Section 3.1.1, MAGENTA shall pay to HDPR a fee equal to [***], which fee will cover the first [***] of the Technology Research Term. If MAGENTA elects to extend the Technology Research Term for an additional [***], as provided in Section 2.3.1, [***], then MAGENTA will pay HDPR an additional [***] for each such extension prior to the anniversary of the Effective Date.

9.1.2 Research Target Fee and Research Target Extension Fee.

(a) With respect to a Target for which MAGENTA has exercised its Exclusive Research Option Right pursuant to Section 3.3, MAGENTA shall pay to HDPR a fee (the "**Research Target Fee**") equal to [***] within [***] after receiving written confirmation from the Trusted Person that such Target is not a Blocked Target. An additional [***] is due upon [***] of MAGENTA's exercise of the Exclusive Research Option Right for the corresponding Target (the "**Research Target Extension Fee**"). For the avoidance of doubt, the Research Target Fees for the Initial Targets will be paid by MAGENTA within [***] after the Effective Date, and the Research Target Extension Fees for the Initial Targets is due on the first anniversary of the Effective Date.

(b) Notwithstanding the foregoing, no Research Target Fee or Research Target Extension Fee shall be paid by MAGENTA with respect to the fourth Target for which MAGENTA exercises its Exclusive Research Option Right.

(c) If, on an Exclusive Research Target-by-Exclusive Research Target basis, MAGENTA elects to terminate, pursuant to Section 18.2.1 or Section 18.2.3, the exclusive license granted to it pursuant to Section 3.5 with respect to an Exclusive Research Target, then MAGENTA will have no obligation to pay to HDPR the Research Target Extension Fee with respect to such terminated Exclusive Research Target, so long as such Research Target Extension Fee has not already become payable by MAGENTA for such Exclusive Research Target. For reasons of clarity, in case of termination of the exclusive license for an Exclusive Research Target as aforesaid, already paid Research Target Fees will not be reimbursed, neither in total nor partially by HDPR.

(d) Should MAGENTA elect its Development Option Right with respect to an Exclusive Research Target before expiration of the respective Target Research Term, MAGENTA shall receive a credit [***]. For example, [***].

9.1.3 Schedule for Research Payments. The following schedule shall illustrate the fees to be paid by MAGENTA pursuant to Sections 9.1.1 and 9.1.2:

Technology Fees

[***]	[***]
[***]	[***]

Research Target Fees

[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

9.2 Development Payments.

9.2.1 Development Option Fee for MAGENTA Development Option. For each Exclusive Research Target, within [***] of MAGENTA exercising its Development Option Right for such Exclusive Research Target, MAGENTA shall pay to HDPR a fee (each, a "**Development Option Fee**") in the amount of [***].

9.2.2 Milestone IND-Enabling Studies. Within [***] days of MAGENTA first initiating an IND-Enabling Study for the first Development Target, MAGENTA will pay a one-time fee in the amount of [***]. For the avoidance of doubt, the milestone described in this Section 9.2.2 shall be payable the one-time only.

9.2.3 Development Events.

(a) For each Development Target, MAGENTA shall pay up to a total of [***] upon achievement of the following development events by a Product directed toward such Development Target (each, a "**Development Milestone**"):

	(In Million USD)	
Development Event	**1st Indication**	**2nd Indication**
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]

(b) Within [***] of the achievement of a Development Milestone, MAGENTA shall notify HDPR of such achievement and pay to HDPR the amount associated with achievement of such Development Milestone.

(c) The Development Milestone payments in the table above shall be payable by MAGENTA to HDPR upon the first achievement of each such Development Milestone for the first Product directed toward a Development Target that achieves the Development Milestone, but not for any subsequent Products directed to the same Development Target that achieves the same Development Milestone. If development of a Product directed toward a Development Target is discontinued before such Product has achieved all of the foregoing Development Milestones, then Development Milestones achieved by any subsequent Product directed toward such Development Target shall be waived for any previously paid Development Milestones, but not for any previously unpaid Development Milestones.

(d) With respect to Development Milestones that may be triggered by a Product upon achievement of such Development Milestones by such Product in a second Indication, the payment of the Development Milestone for the first Indication shall always precede payment for the second Indication. By way of example, [***].

9.3 Sale Payments.

9.3.1 Sales Events. For each commercialized Product, MAGENTA shall pay up to a total of [***] upon achievement of the following sale levels for a Product (each, a "**Sales Milestone**").

Sales Event	**(In Million USD)**
[***]	[***]
[***]	[***]

9.3.2 Limitation. The set of Sale Milestone payments in the table above shall be payable by MAGENTA to HDPR upon the first achievement of each such Sales Milestone for the first Product directed toward a Development Target, but not for any subsequent Products directed toward such same Development Target that achieves the same Sales Milestone.

9.4 Royalty Payments.

9.4.1 Royalty Rate; Royalty Term. MAGENTA shall pay HDPR royalties at a rate of [***] of aggregate Calendar Year Net Sales of Products, on a Product-byProduct and country-by-country basis (the "**Royalty Rate**"), until the expiry of the Royalty Term for a Product in a country. Thereafter, the licenses with respect to such Product in such country shall be fully paid-up, royalty-free, perpetual and irrevocable in accordance with Section 18.3.3(a).

9.4.2 No Valid Claim. If no Valid Claim of any Patent Rights included in the HDPR IP Rights or Joint IP Rights Covers the using, selling, offering for sale or importing of a Product in a country, then the Royalty Rate shall be reduced to [***] of aggregate Calendar Year Net Sales of such Product in such country.

9.4.3 Third Party Payments. HDPR shall be responsible for all payment and other obligations related to Products and HDPR IP Rights set forth in its agreements with Third Parties. Subject to Section 9.4.5, MAGENTA shall be entitled to deduct [***] of any Deductible Third Party Payments made by MAGENTA or its Sublicensees from royalties owed on Net Sales of Products; provided that MAGENTA shall not be entitled to take this deduction with respect to a Product in a country if MAGENTA has reduced the royalties owed under this Agreement under Section 9.4.2 with respect to such Product in such country.

9.4.4 Buy-Out Option. On a Product-by-Product basis, HDPR hereby grants MAGENTA and its Sublicensees the option to reduce the Royalty Rates set forth in Section 9.4.1 (the "**Buy-Out Option**") by sending a written notice of such election to HDPR (the "**Buy-Out Option Exercise Notice**") and making a one-time payment to HDPR within [***] of the date of such notice (the "**Buy-Out Option Fee**") as set forth below.

(a) The Buy-Out Option Exercise Fee amounts to [***] in case that HDPR receives both the Buy-Out Option Exercise Notice and payment of the Buy-Out Option Fee prior to Initiation of a Phase II Clinical Study for a certain Product.

(b) The Buy-Out Option Exercise Fee amounts to [***] in case that HDPR receives both the Buy-Out Option Exercise Notice and payment of the Buy-Out Option Fee prior to Initiation of a Phase III Clinical Study for a certain Product.

In both cases (a) and (b) above the Royalty Rates for such Product shall be reduced from [***] of aggregate Calendar Year Net Sales of such Product in all countries in the Territory. [***]. [***].

9.4.5 Royalty Floor. Except for the case of No Valid Claim as set forth in Section 9.4.2, in no event shall the total royalty payable by MAGENTA to HDPR for any Product in any country be less than [***] after any deductions allowed pursuant to Section 9.4.3. MAGENTA shall have the right to carry forward as offsets against future royalties payable to HDPR any amounts that, but for the foregoing limitations, MAGENTA and its Sublicensees would have been entitled to deduct from any royalty payable to HDPR under this Agreement.

10. Accounting and Reporting.

10.1 Timing of Royalty Payments. MAGENTA shall calculate royalties on Net Sales Calendar Quarterly, and MAGENTA shall pay any royalties owed to HDPR pursuant to Section 9.4.1 on account of such Net Sales within [***] after the end of the applicable Calendar Quarter, with such payment to be made to the banking account set forth under Section 10.3. Each payment of royalties due to HDPR will be accompanied by a statement of the amount of Net Sales of each Product in each country in the Territory during the applicable Calendar Quarter and a calculation of the amount of royalty payment due on such Net Sales for such Calendar Quarter.

10.2 Payment Modalities. All payments to HDPR under this Agreement will be made by MAGENTA by deposit of Dollars in the requisite amount to the bank account listed in Section 10.3. For the purpose of calculating any sums due under this Agreement (including the calculation of Net Sales expressed in currencies other than Dollars), MAGENTA will convert any amount expressed in a foreign currency into Dollar equivalents using its own or its Sublicensee's standard conversion methodology consistent with Accounting Standards. MAGENTA will have the right to offset any amounts that are owed by HDPR to MAGENTA and are undisputed or determined by a legally binding court order against any payments owed by MAGENTA, if any, under this Agreement.

10.3 Bank Account. All payments due by MAGENTA to HDPR under this Agreement will be made to the following banking account (or such other banking account as HDPR may designate to MAGENTA from time to time in writing):

[***]

10.4 Late Payment. Any payment under this Agreement that is not paid on or before the date such payment is due shall bear interest, to the extent permitted by Applicable Law, at [***] above the US prime rate of interest, as reported by the Wall Street Journal, calculated on the number of days such payment is overdue.

11. Taxes.

11.1 Responsibility. HDPR shall provide such information and documentation to MAGENTA as are reasonably requested by MAGENTA to determine if any withholding taxes apply to any payments to be made by MAGENTA to HDPR. Solely to the extent that Applicable Laws require that taxes be withheld with respect to any payments by MAGENTA to HDPR under this Agreement, MAGENTA will: (a) deduct those taxes from the remittable payment, (b) pay the taxes to the proper taxing authority, and (c) send evidence of the obligation together with proof of tax payment to HDPR on a reasonable and timely basis following that tax payment. Each Party agrees to cooperate with the other Party in claiming refunds or exemptions from such deductions or withholdings under any relevant agreement or treaty which is in effect. The Parties shall discuss applicable mechanisms for minimizing such taxes to the extent possible in compliance with Applicable Laws. HDPR will pay any and all taxes levied on account of all payments it receives under this Agreement.

11.2 Cooperation. The Parties shall cooperate in accordance with Applicable Laws to minimize indirect taxes (such as value added tax, sales tax, consumption tax and other similar taxes) in connection with this Agreement.

12. Financial Auditing.

12.1 HDPR Right to Audit. MAGENTA shall keep, and shall require its Sublicensees to keep, full, true and accurate books of account and records containing all particulars that may be necessary for the purpose of calculating all royalties payable under this Agreement. Such books and records will be retained by MAGENTA and its Sublicensees until the later of (a) [***] after the end of the period to which such books and records pertain or (b) for such longer period as may be required by Applicable Law. Such books and records shall be kept at their principal place of business. At the expense of HDPR, upon at least [***] to MAGENTA or its Sublicensees, as applicable, HDPR has the right to engage a reputed public accounting firm to perform, on behalf of HDPR, an audit of the books and records that are maintained by MAGENTA and its Sublicensees pursuant to this Section 12.1 to ensure the accuracy of all royalty reports and payments made pursuant to this Agreement; provided that, prior to commencing any such audit, such accounting firm shall be required to enter into a confidentiality and non-disclosure agreement with MAGENTA or its Sublicensees, as applicable, that requires such accounting firm to maintain in confidence and not disclose (except as expressly provided for in this Section 12.1) any information learned by such accounting firm during such audit. Such audits may not (a) be conducted for any Calendar Quarter more than [***] after the end of such Calendar Quarter, (b) be conducted more than once in any [***] period or (c) [***]. Such examinations shall occur during regular business hours in such a manner as to not interfere with MAGENTA's or its Sublicensees' normal business activities. Results of any audit under this Section 12.1 shall be made available to both MAGENTA and HDPR pursuant to a written report. Such written report shall only contain the amounts that the public accounting firm believes to be due and payable hereunder, including details concerning any discrepancy from the amount paid and potential reasons for such discrepancy, but shall contain no other information of MAGENTA or its Sublicensees. The results of such audits, including the written report provided pursuant to this Section 12.1, shall be the Confidential Information of MAGENTA.

12.2 Overpayments and Underpayments. If the audit reveals an overpayment, such overpayment shall be credited against future royalty payments owed to HDPR under this Agreement or, if no future royalty payments are owed to HDPR under this Agreement, then HDPR shall reimburse MAGENTA, as applicable, for the amount of such overpayment within [***] of receiving the accounting firms written report pursuant to Section 12.1. If the audit reveals an underpayment, MAGENTA shall make such underpayment with the next royalty payment or, if no future royalty payments are owed to HDPR, MAGENTA shall reimburse HDPR for the amount of the underpayment within [***] of receiving the accounting firms written report pursuant to Section 12.1. MAGENTA shall pay for the reasonable and documented costs of such audit only if MAGENTA made an underpayment that exceeds [***] of the aggregate amount of royalty payments owed with regard to the royalty statements subject of the audit. Underpayments that are not paid when due shall bear interest in accordance with Section 10.4.

13. Intellectual Property.

13.1 Background IP. **As between the Parties, (a)** MAGENTA will retain ownership of all rights, title and interests in, to and under all MAGENTA IP Rights Controlled by MAGENTA prior to the Effective Date or Controlled by MAGENTA during the Agreement Term but that are not generated in the performance of the Research Activities contemplated under this Agreement and (b) HDPR will retain ownership of all rights, title and interests in, to and under the HDPR IP Rights Controlled by HDPR prior to the Effective Date or Controlled by HDPR during the Agreement Term but that is not generated in the performance of the activities contemplated under this Agreement.

13.2 Ownership of Inventions. Except as otherwise expressly provided herein, ownership of all inventions and discoveries governed by this Agreement shall be determined based on inventorship, and inventorship shall be determined in accordance with U.S. patent law.

13.2.1 MAGENTA IP Improvements. As between the Parties, MAGENTA shall be the sole owner of the Improvements solely related to MAGENTA IP Rights (the "**MAGENTA IP Improvements**").

13.2.2 HDPR IP Improvements. As between the Parties, HDPR shall be the sole owner of the Improvements solely related to HDPR IP Rights (the "**HDPR IP Improvements**"). HDPR IP Improvements shall be included under the rights and licenses granted by HDPR to MAGENTA and its Affiliates in accordance with Section 3.

13.2.3 Joint IP Rights. The term "**Joint IP Rights**" means all Improvements that are neither MAGENTA IP Improvements nor HDPR IP Improvements. As between the Parties, MAGENTA shall be the sole owner of the Joint IP Rights.

13.3 German Statute on Employee's Inventions. In accordance with the German Statute on Employees' Inventions, each Party agrees to claim the unlimited use of any invention conceived, reduced to practice, developed, made or created in the performance of, or as a result of, any Research Activities by its German employees or any other German Person acting on its behalf. The Party which is the ultimate assignee of the German employee's or other Person's invention under this Agreement will reimburse the other Party for the royalty payable according to statutory provisions or negotiated with the employee or other Person, provided that such reimbursement will not exceed a payment equal to a royalty rate of [***] on Net Sales for an invention.

13.4 Trademarks. MAGENTA shall own all trademarks, services marks, trade names, product names, logos and all other indicia of source and origin, together with all goodwill related thereto, used on or in connection with Products in the Territory (collectively, "**Product Marks**"), and shall, at its sole cost and acting in its sole discretion, be responsible for the procurement, maintenance, enforcement and defense of all Product Marks in the Territory. MAGENTA shall have the right to obtain from the World Health Organization International Nonproprietary Name Committee and the US Adopted Names Council a generic name for the Products.

13.5 Right to Handle the Patents.

13.5.1 HDPR IP Rights. HDPR shall, at its sole cost and acting in its sole discretion, be responsible for Handling the Patent Rights included in the HDPR IP Rights and HDPR IP Improvements. HDPR shall promptly provide MAGENTA with copies of any material official correspondence to or from patent offices regarding the Patent Rights included in the HDPR IP Improvements. HDPR shall provide MAGENTA with a reasonable opportunity to review and comment on material filings relating to such Patent Rights before such filings are submitted to any relevant patent office or governmental authority, and shall give reasonable, good faith, consideration to comments offered by MAGENTA with respect thereto in any final filings submitted by HDPR to any relevant patent office or governmental authority; provided that HDPR shall have the final decision with respect thereto.

13.5.2 MAGENTA IP Rights.

(a) MAGENTA shall, at its sole cost and acting in its sole discretion, Handle all Patent Rights included in the MAGENTA IP Rights, MAGENTA IP Improvements and Joint IP Rights; provided that MAGENTA shall provide HDPR with a reasonable opportunity to review and comment on material filings relating to Patent Rights including in the Joint IP Rights before such filings are submitted to any relevant patent office or governmental authority and shall give reasonable, good faith, consideration to comments offered by HDPR with respect thereto in any final filings submitted by MAGENTA to any relevant patent office or governmental authority; provided that MAGENTA shall have the final decision with respect thereto. MAGENTA shall promptly provide HDPR with copies of any material official correspondence to or from patent offices regarding the Patent Rights included in the Joint IP Rights.

(b) Should MAGENTA decide that it does not desire to Handle a Patent Right included in the Joint IP Rights in a country in the Territory, it shall promptly advise HDPR thereof. At the written request of HDPR, MAGENTA shall, at no cost to HDPR, assign such Patent Rights in such country to HDPR, and HDPR may thereafter Handle such Patent Right at HDPR's own cost, to the extent that HDPR desires to do so.

13.6 Infringement.

13.6.1 Notification. Each Party shall promptly provide written notice to the other Party during the Agreement Term of any (a) known infringement or suspected infringement by a Third Party of any Patent Rights included in the HDPR IP Rights, HDPR IP Improvements or Joint IP Rights or (b) known or suspected unauthorized use or misappropriation by a Third Party of Know-How included in the HDPR IP Rights, HDPR IP Improvements or Joint IP Rights, and shall provide the other Party with all evidence in its possession supporting such infringement or unauthorized use or misappropriation.

13.6.2 Right to Enforce. MAGENTA shall have the sole right and option, but not the obligation, to bring an infringement action for suspected infringement of the Patent Rights or Know-How included in the MAGENTA IP Rights, MAGENTA IP Improvements or Joint IP Rights (other than with respect to Patent Rights included in the Joint IP Rights assigned to HDPR pursuant to Section 13.5.2(b)). [***]. HDPR shall reasonably assist MAGENTA (at MAGENTA's expense) in any such infringement action if so requested, including by being named or joined as a plaintiff to such action. In the event that either Party learns of an infringement action for suspected infringement of the Patent Rights or Know-How included in the HDPR IP Rights or HDPR IP Improvements that (a) relates to the development, manufacture or sale of a product that is or is reasonably expected to be competitive to a Product and (b) does not and is not reasonably expected to infringe any of the Patent Rights or Know-How included in the MAGENTA IP Rights, MAGENTA IP Improvements or Joint IP Rights ((a)-(b), a "**Competitive Infringement**"), then the Party that first learns of such Competitive Infringement will notify the other Party thereof in writing. [***].

13.6.3 Damages. In the event that MAGENTA exercises the rights conferred in Section 13.6.2 and recovers any damages or other sums in such infringement action, or in settlement thereof, such damages or other sums recovered shall (a) with respect to damages or other sums recovered on account of infringement of the Patent Rights included in the MAGENTA IP Rights and MAGENTA IP Improvements, be solely retained by MAGENTA, (b) with respect to damages or other sums recovered on account of infringement of the Patent Rights included in the Joint IP Rights, first be applied to all reasonable out-of-pocket costs and expenses incurred by the Parties in connection with the action relating to such infringement (including reasonable attorneys' fees), with the remainder shared [***] and (c) with respect to damages or other sums

recovered on account of MAGENTA's step-in enforcement rights with respect to a Competitive Infringement, first be applied to all reasonable out-of-pocket costs and expenses incurred by the Parties in connection with the action relating to such infringement (including reasonable attorneys' fees), with the remainder shared [***]. In the event that HDPR exercises its first right to bring an infringement action for a Competitive Infringement pursuant to Section 13.6.2 and recovers any damages or other sums in such infringement action, or in settlement thereof, such damages or other sums recovered shall first be applied to all reasonable out-of-pocket costs and expenses incurred by the Parties in connection therewith (including reasonable attorneys' fees), with the remainder shared [***], respectively. If any recovery is insufficient to cover all costs and expenses of the Parties as aforesaid, such recovery shall be shared in proportion to the total of such costs and expenses incurred by each Party.

14. Representations and Warranties.

14.1 Mutual Representations and Warranties. Each Party represents and warrants to the other Party that, as of the Effective Date:

(a) it is duly organized and validly existing under the laws of its jurisdiction of incorporation or formation, and has full corporate or other power and authority to enter into this Agreement, and to carry out the provisions hereof;

(b) it is duly authorized to execute and deliver this Agreement, and to perform its obligations hereunder, and the Person or Persons executing this Agreement on its behalf has been duly authorized to do so by all requisite corporate action; and

(c) this Agreement is legally binding upon it and enforceable in accordance with its terms.

14.2 Representations and Warranties of HDPR. HDPR represents and warrants to MAGENTA, as of the Effective Date, that:

(a) it is the sole and exclusive owner of all HDPR IP Rights, free of any lien or security interest;

(b) it has the power and authority to grant and license to the MAGENTA all of the rights, title and interests purported to be granted herein;

(c) no Third Party has challenged the ownership, scope, duration, validity, enforceability, priority or right to use any HDPR IP Rights;

(d) to HDPR's knowledge, the use, development, manufacture or commercialization by HDPR or MAGENTA (or their respective Affiliates, Sublicensees or subcontractors, as applicable) of the Compound or Products do not infringe any issued patent of any Third Party;

(e) there is no (i) claim, demand, suit, proceeding, arbitration, inquiry, investigation or other legal action of any nature (whether civil, criminal, regulatory or otherwise) pending or, to HDPR's knowledge, threatened against HDPR or any of its Affiliates or (ii) judgment or settlement against or owed by HDPR or any of its Affiliates, in each case ((i)-(ii)), with respect to the HDPR IP Rights or any Amanitin Toxin Construct;

(f) to HDPR's knowledge, no Third Party is infringing any HDPR IP Rights;

(g) HDPR has not intentionally failed to furnish MAGENTA with any information requested by MAGENTA, or intentionally concealed from MAGENTA any information in its possession, regarding the safety of Amanitin Toxin Constructs; and

(h) neither HDPR nor its Affiliates, nor any of their employees, officers, subcontractors or consultants who have rendered services relating to the Compounds or Products (a) has ever been debarred or is subject to debarment or convicted of a crime for which an entity or person could be debarred by the FDA under 21 U.S.C. Section 335a or (b) have ever been under indictment for a crime for which a person or entity could be so debarred.

14.3 Covenants of HDPR. HDPR covenants to MAGENTA that, from and after the Effective Date and during the Agreement Term of this Agreement:

(a) it shall not, and shall cause its Affiliates to not, assign, transfer, convey, option or grant any rights to the HDPR IP Rights or HDPR IP Improvements that are inconsistent with or would conflict with or limit the scope of any of the rights or licenses granted to MAGENTA hereunder; and

(b) it shall not, and shall cause its Affiliates to not (i) license, sell, assign or otherwise transfer to any Person (other than to a successor in interest as permitted under Section 19.3) any HDPR IP Rights or HDPR IP Improvements (or agree to do any of the foregoing) or (ii) incur or permit to exist, with respect to any HDPR IP Rights or HDPR IP Improvements, any lien, encumbrance, charge, security interest, mortgage, liability, grant of license to Third Parties or other restriction (including in connection with any indebtedness) that would reduce or adversely affect MAGENTA's rights hereunder.

15. Indemnification.

15.1 Indemnification by MAGENTA. MAGENTA shall indemnify, hold harmless and defend HDPR and its Affiliates, and its and their directors, officers, employees and agents from and against any and all losses, expense and, cost of defense (including reasonable attorneys' fees, witness fees, damages, judgments, fines and amounts paid in settlement) arising in connection with any claims, suits, proceedings or other causes of action brought by a Third Party to the extent arising out of (a) a breach by MAGENTA or its Affiliates of its representations, warranties and covenants set forth in Section 14 or a breach of Section 17, (b) the gross negligence, willful misconduct or fraud of MAGENTA or its Affiliates and (c) the development or use of any Compound or Product by MAGENTA or its Affiliates, with respect to each ((a)-(c)), except to the extent such losses, expenses, costs and amounts are due to the gross negligence, willful misconduct or fraud of HDPR or its Affiliates.

15.2 Indemnification by HDPR. HDPR shall indemnify, hold harmless and defend the MAGENTA Group (which, for purposes of this Section 15.2 only, will include Affiliates of MAGENTA, whether or not such Affiliates have been granted a sublicense hereunder) and its Contractors, directors, officers, employees and agents from and against any and all losses, expenses and costs of defense (including reasonable attorneys' fees, witness fees, damages, judgments, fines and amounts paid in settlement) arising in connection with any claims, suits, proceedings or other causes of action brought by a Third Party to the extent arising out of (a) a breach by HDPR or its Affiliates of its representations, warranties and covenants set forth in Section 14 or a breach of Section 17 and (b) the gross negligence, willful misconduct or fraud of HDPR or its Affiliates, with respect to each ((a)-(b)), except to the extent such losses, expenses, costs and amounts are due to the gross negligence, willful misconduct or fraud of a member of the MAGENTA Group.

15.3 Procedure. In the event of a claim by a Third Party against a Person entitled to indemnification under this Agreement ("**Indemnified Party**"), the Indemnified Party shall promptly notify the other Party ("**Indemnifying Party**") in writing of the claim and the Indemnifying Party shall undertake and solely manage and control, at its sole expense, the defense of the claim, including any settlement thereof. The Indemnified Party shall, at the Indemnifying Party's expense, reasonably cooperate with the Indemnifying Party in connection with the defense of such claim and may, at its option and expense, be represented in any such action or proceeding by counsel of its choice. The Indemnifying Party shall not be liable for any litigation costs or expenses incurred by the Indemnified Party without the Indemnifying Party's written consent. The Indemnifying Party shall not settle any such claim unless such settlement fully and unconditionally releases the Indemnified Party from all liability relating thereto, unless the Indemnified Party agrees in writing otherwise.

16. Limitation of Liability; Disclaimer

16.1 Limitation of Liability. EXCEPT IN CONNECTION WITH (A) BREACHES OF SECTION 17 BY HDPR OR ITS AFFILIATES, (B) THE GROSS NEGLIGENCE, WILLFUL MISCONDUCT OR FRAUD OF HDPR OR ITS AFFILIATES OR (C) LOSSES AND CLAIMS PURSUANT TO SECTION 15.2, THE LIABILITY OF HDPR UNDER THIS AGREEMENT IS LIMITED TO [***].

16.2 Consequential Damages. EXCEPT IN CONNECTION WITH (A) BREACHES OF SECTION 17 BY A PARTY OR ITS AFFILIATES, (B) THE GROSS NEGLIGENCE, WILLFUL MISCONDUCT OR FRAUD OF A PARTY OR ITS AFFILIATES OR (C) LOSSES AND CLAIMS PURSUANT TO SECTION 15, IN NO EVENT SHALL EITHER HDPR OR THE MAGENTA GROUP BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, PUNITIVE OR CONSEQUENTIAL DAMAGES, INCLUDING LOSS OF PROFITS OR BUSINESS INTERRUPTION, ARISING OUT OF THIS AGREEMENT, WHETHER BASED ON CONTRACT, TORT, STATUTORY DUTY OR ANY OTHER LEGAL THEORY, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

16.3 Disclaimer. THE REPRESENTATIONS AND WARRANTIES SET FORTH IN SECTION 14 ARE IN LIEU OF ALL OTHER REPRESENTATIONS AND WARRANTIES NOT EXPRESSLY SET FORTH HEREIN. HDPR AND MAGENTA DISCLAIM ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, WITH RESPECT TO EACH OF THEIR RESEARCH, DEVELOPMENT AND COMMERCIALIZATION EFFORTS HEREUNDER, INCLUDING, WHETHER THE PRODUCTS CAN BE SUCCESSFULLY DEVELOPED OR MARKETED OR THE ACCURACY, PERFORMANCE, UTILITY, RELIABILITY, TECHNOLOGICAL OR COMMERCIAL VALUE, COMPREHENSIVENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE WHATSOEVER OF THE PRODUCTS.

17. Obligation Not to Disclose Confidential Information.

17.1 Non-Use and Non-Disclosure. During the Agreement Term and for [***] thereafter, a Receiving Party shall (a) keep in confidence and not disclose to any Third Party any Confidential Information provided to it by the Disclosing Party, using the same degree of care in protecting such Confidential Information as it would use to protect its own information of a similar nature (but in no event, less than a reasonable degree of care) and (b) not use or disclose such Confidential Information other than as expressly provided for in this Agreement or as reasonably necessary for fulfilling its obligations or exercising its rights under this Agreement.

17.2 Permitted Disclosure. Notwithstanding the obligation of non-use and nondisclosure set forth in Section 17.1, the Parties recognize the need for certain exceptions to this obligation, specifically set forth below, with respect to press releases, Patent Rights, publications, and certain commercial considerations. To that end, each Party may disclose Confidential Information to the extent such disclosure is:

17.2.1 in the reasonable opinion of the Receiving Party's legal counsel, required to be disclosed pursuant to Applicable Law or a valid order of a court of competent jurisdiction or governmental body; provided that the Receiving Party will first have given prompt written notice to the Disclosing Party so that the Disclosing Party has a reasonable opportunity to take whatever action it deems necessary to protect its Confidential Information. In the event that no protective order or other remedy is obtained, or the Disclosing Party waives compliance with the terms of this Agreement, the Receiving Party will furnish only that portion of Confidential Information which the Receiving Party is advised by counsel is legally required to be disclosed;

17.2.2 made by or on behalf of MAGENTA to Regulatory Authorities as required in connection with any filing, application or request for Regulatory Approval of a Product in accordance with the MAGENTA's rights under the terms of this Agreement; provided that reasonable measures will be taken to assure confidential treatment of HDPR's Confidential Information to the extent practicable and consistent with Applicable Law;

17.2.3 made by or on behalf of the Receiving Party to a patent authority as may be reasonably necessary or useful for purposes of Handling a Patent Right in accordance with the Receiving Party's rights under the terms of this Agreement; provided that the Disclosing Party is informed about such disclosure and reasonable measures will be taken to assure confidential treatment of such Confidential Information, to the extent such protection is available; and

17.2.4 made by the Receiving Party to its (a) financial and legal advisors who have a need to know the Disclosing Party's Confidential Information, (b) its Affiliates or (c) its or their advisors, consultants, clinicians, vendors, service providers, Sublicensees or Contractors as may be necessary or reasonably required in connection with the research, development, manufacture, commercialization, use or other exploitation of Compounds or Products; provided that such Persons (the "**Permitted Recipients**") will be subject to obligations of confidentiality and non-use with respect to such Confidential Information at least as protective to the Disclosing Party as the obligations of confidentiality and non-use of the Receiving Party pursuant to this Section 17.

17.3 Publications. Notwithstanding the obligation of non-use and non-disclosure set forth in Section 17.1, during the Agreement Term, the following provisions shall apply with respect to disclosure by any Party of Confidential Information relating to the Product in any publication or presentation:

(a) Both Parties acknowledge that it is their policy for the studies and results thereof to be registered and published in accordance with their internal guidelines.

(b) A Party ("**Publishing Party**") shall provide the other Party with a copy of any proposed publication or presentation at least [***] (or at least [***] in the case of oral presentations) prior to submission for publication or presentment so as to provide such other Party with an opportunity to recommend any changes it reasonably believes are necessary to continue to maintain the confidentiality of any Confidential Information contained in such publication or presentation and disclosed by the other Party to the Publishing Party pursuant to this Agreement. The Publishing Party shall reasonably consider any such recommended changes and will not unreasonably refuse to incorporate any such changes. If such other Party notifies ("**Publishing Notice**") the Publishing Party in writing, within [***] after receipt of the copy of the proposed publication or presentation (or at least [***] in the case of oral presentations), that such publication or presentation, in its reasonable judgment, (i) contains an invention, solely or jointly conceived or reduced to practice by the other Party, for which the other Party reasonably desires to obtain patent protection or (ii) could be expected to have an adverse effect on the commercial value of the other Party's Patent Rights, Know-How, Compounds or Products, with respect to each ((i)-(ii)), then the Publishing Party shall prevent such publication or delay such publication for a mutually agreeable period of time. In the case of inventions, a delay shall be for a period reasonably sufficient to permit the timely preparation and filing of a patent application(s) on such invention, and in no event less than [***] from the date of the Publishing Notice. Notwithstanding the foregoing, in no event may HDPR or its Affiliates make a publication or presentation with respect to any Compound or Product without first obtaining MAGENTA's prior written consent.

(c) On or promptly after the Effective Date, the Parties shall issue a public announcement regarding the execution of this Agreement, to be previously agreed upon by the Parties and attached hereto as Appendix 3.

18. Term and Termination.

18.1 Commencement and Term. This Agreement shall commence upon the Effective Date and continue for the Agreement Term.

18.2 Termination.

18.2.1 Termination for Breach. In the event a Party ("**Breaching Party**") is in material breach of any of its obligations under this Agreement, including under Section 9, the other Party ("**Non-Breaching Party**") shall have the right to terminate this Agreement in its entirety in accordance with this Section 18.2.1; provided that, if such material breach does not constitute a material breach of the payment obligations set forth in Article 9 and relates solely to a specific Product, Non-Exclusive Research Target, Exclusive Research Target or Development Target, then the Non-Breaching Party shall have the right to terminate this Agreement solely with respect to such Product, Non-Exclusive Research Target, Exclusive Research Target or Development Target in accordance with this Section 18.2.1. The Non-Breaching Party shall provide written notice to the Breaching Party, which notice shall identify the breach and the Products, Non-Exclusive Research Targets, Exclusive Research Targets or Development Targets to which such breach relates. The Breaching Party shall have a period of [***] after such written notice is provided ("**Peremptory Notice Period**") to cure such breach. If the Breaching Party has a bona fide dispute as to whether such breach has occurred or has been cured, it will so notify the Non-Breaching Party in writing, and the Peremptory Notice Period shall be tolled until such dispute is resolved pursuant to Section 19.2. Upon a final determination of breach or failure to cure, the Breaching Party shall have the remainder of the Peremptory Notice Period to cure such breach. If such breach is not cured within the Peremptory Notice Period, then the Non-Breaching Party may provide the Breaching Party with a written notice of termination specifying the Products, Non-Exclusive Research Targets, Exclusive Research Targets or Development Targets with respect to which the Agreement is terminating, which termination will be effective as of the date such written notice is received by the Breaching Party; provided, however, that if such breach is not reasonably curable within such [***] period and the Breaching Party is using good faith efforts to cure such breach during such [***] period, then the Breaching Party will have an additional [***] to cure such breach.

18.2.2 Insolvency. A Party shall have the right to terminate this Agreement, if the other Party experiences an Insolvency Event; provided, however, that, in the case of any involuntary bankruptcy proceeding, such right to terminate shall only become effective if the Party that incurs the Insolvency Event consents to the involuntary bankruptcy proceeding or such proceeding is not dismissed within [***] after the filing thereof.

18.2.3 Termination by MAGENTA Without Cause. MAGENTA shall have the right to terminate the Agreement, at any time, in its entirety or on a Non-Exclusive Research Target-by-Non-Exclusive Research Target, Exclusive Research Target-by-Exclusive Research Target, Development Target-by-Development Target, Product-by-Product or country-by-country basis, upon (a) [***] prior written notice to HDPR, if terminating before First Commercial Sale of a Product in a country or (b) [***] prior written notice to HDPR, if terminating after the First Commercial Sale of such Product or a Product directed to such Exclusive Research Target, as applicable, in a country. By way of example, if First Commercial Sale of a Product has occurred in the EU but not in the US and MAGENTA desires to terminate this Agreement with respect to such Product, then MAGENTA will be required to provide HDPR with [***] prior written notice to terminate this Agreement with respect to such Product in the EU, but will only be required to provide HDPR with [***] prior written notice to terminate this Agreement with respect to such Product in the US.

18.3 Consequences of Termination and Expiration.

18.3.1 Partial Termination. Upon any termination of this Agreement with respect to a Product, Non-Exclusive Research Target, Exclusive Research Target or Development Targets by HDPR for MAGENTA's material breach in accordance with Section 18.2.1 or by MAGENTA for HDPR's material breach in accordance with Section 18.2.1 or at-will pursuant to Section 18.2.3:

(a) all rights and licenses granted by a Party to another Party under this Agreement shall terminate immediately on the effective date of termination with respect to the terminated Product, Non-Exclusive Research Target, Exclusive Research Target or Development Target, as applicable; provided that MAGENTA's grant of the Grant-Back License to HDPR shall not terminate;

(b) with respect to a terminated Product, should MAGENTA have any inventory of a Product for which Regulatory Approval has been obtained prior to termination, MAGENTA shall have [***] thereafter in which to dispose of such inventory (subject to the payment to HDPR of any royalties due hereunder arising from such disposition);

(c) each Party shall reasonably promptly return or, at the written election of the Disclosing Party, destroy all Confidential Information of the Disclosing Party in its possession or control that are solely related to the terminated Product, Non-Exclusive Research Target, Exclusive Research Target or Development Target; provided that each Party may keep one archival copy of such Confidential Information; and

(d) neither Party shall be relieved of any obligation that accrued prior to the effective date of such termination.

18.3.2 Termination in its Entirety. Upon any termination of this Agreement in its entirety by HDPR for MAGENTA's insolvency in accordance with Section 18.2.2 or by MAGENTA for HDPR's insolvency in accordance with Section 18.2.2 or at-will pursuant to Section 18.2.3:

(a) all rights and licenses granted by a Party to another Party under this Agreement; provided that MAGENTA's grant of the Grant-Back License to HDPR shall not terminate;

(b) should MAGENTA have any inventory of any Product approved and allocated prior to termination for sale in the Territory, MAGENTA shall have [***] thereafter in which to dispose of such inventory (subject to the payment to HDPR of any royalties due hereunder arising from such disposition);

(c) each Party shall reasonably promptly return or, at the written election of the Disclosing Party, destroy all Confidential Information of the Disclosing Party in its possession or control; provided that each Party may keep one archival copy of such Confidential Information; and

(d) neither Party shall be relieved of any obligation that accrued prior to the effective date of such termination.

18.3.3 Effects of Expiration. Upon any expiration of this Agreement with respect to a given country and a given Product, or in its entirety:

(a) the licenses with respect to the HDPR IP Rights and HDPR IP Improvements granted to MAGENTA under Section 3 with respect to such country and such Product shall be conclusively deemed to continue to remain in full force and effect and shall be fully paid-up, perpetual and irrevocable;

(b) all amounts due or payable to HDPR that were accrued, or that arise out of acts or events occurring, prior to the effective date of expiration shall remain due and payable, but no additional amounts shall be payable based on events occurring after the effective date of termination;

(c) HDPR shall reasonably promptly return or, at the written election of MAGENTA, destroy all Confidential Information of MAGENTA in its possession or control; provided that HDPR may keep one archival copy of such Confidential Information; and

(d) neither Party shall be relieved of any obligation that accrued prior to the effective date of such termination.

18.3.4 Rights in Lieu of Termination. In the event that MAGENTA has the right to terminate this Agreement pursuant to Section 18.2.1 with respect to a Product, Non-Exclusive Research Target, Exclusive Research Target or Development Target on account of HDPR's gross negligence or willful misconduct, then, without prejudice to any other rights or remedies MAGENTA may have at law or in equity, MAGENTA may elect, in lieu of such termination, to not terminate this Agreement but have all future payments payable to HDPR with respect to such Product, Non-Exclusive Research Target, Exclusive Research Target or Development Target, after the application of all available reductions and deductions to such payments hereunder, shall be reduced so that the payments MAGENTA owes HDPR under this Agreement are the greater of (a) [***] or (b) [***].

18.4 Rights in Bankruptcy.

18.4.1 Applicability of 11 U.S.C. § 365(n). All rights and licenses (collectively, the "**Intellectual Property**") granted under or pursuant to this Agreement, including all rights and licenses to use Improvements or enhancements developed during the Agreement Term, are intended to be, and will otherwise be deemed to be, for purposes of Section 365(n) of the United States Bankruptcy Code (the "**Bankruptcy Code**") or any analogous provisions in any other country or jurisdiction, licenses of rights to "intellectual property" as defined under Section 101(35A)of the Bankruptcy Code. The Parties agree that the licensee of such Intellectual Property under this Agreement will retain and may fully exercise all of its rights and elections under the Bankruptcy Code, including Section 365(n) of the Bankruptcy Code, or any analogous provisions in any other country or jurisdiction. All of the rights granted to either Party under this Agreement will be deemed to exist immediately before the occurrence of any Insolvency Event in which the other Party is the debtor.

18.4.2 Rights of Non-Debtor Party in Bankruptcy. If an Insolvency Event is commenced by or against either Party under the Bankruptcy Code or any analogous provisions in any other country or jurisdiction, the non-debtor Party will be entitled to a complete duplicate of (or complete access to, as appropriate) any Intellectual Property and all embodiments of such Intellectual Property, which, if not already in the non-debtor Party's possession, will be delivered to the non-debtor Party within [***] of such request; provided that the debtor Party is excused from its obligation to deliver the Intellectual Property to the extent the debtor Party continues to perform all of its obligations under this Agreement and the Agreement has not been rejected pursuant to the Bankruptcy Code or any analogous provision in any other country or jurisdiction.

18.5 Survival. In addition to any section, article of provision that is expressly stated to survive termination or expiration of this Agreement, Article 1 (Definitions); Section 3.6 (Grant-Back License); Section 3.7 (with respect to surviving sublicenses); Section 6.1.3 (Further Assurances); Section 7.2 (Right of Reference); Article 12 (Auditing); Section 13.1 (Background IP); Section 13.2 (Ownership of Inventions); Section 13.3 (German Statute on Employee's Inventions); Section 13.4 (Trademarks); Article 15 (Indemnification); Article 16 (Limitation of Liability; Disclaimer); Article 17 (Obligation Not to Disclose Confidential Information); Section 18.3 (Consequences of Termination) and Article 19 (Miscellaneous) shall survive any expiration or termination of this Agreement for any reason.

19. Miscellaneous.

19.1 Governing Law; Place of Jurisdiction. This Agreement shall be governed by the laws of the State of New York, USA, without regard to any conflicts of laws concepts that would apply the substantive law of some other jurisdiction. Any disputes arising out of this Agreement or any other stipulations in connection with this Agreement are to be decided by the competent court of law. Place of jurisdiction for both Parties is New York, NY, US, and each Party irrevocably submits to the exclusive jurisdiction of and laying of venue in such courts. Notwithstanding the foregoing, each Party shall have the right to seek injunctive or other equitable relief from any court of competent jurisdiction as may be necessary to avoid irreparable harm, without the need to post any security.

19.2 Disputes. Unless otherwise set forth in this Agreement, in the event of any dispute in connection with this Agreement, such dispute shall be referred to the respective executive officers of the Parties designated below or their designees, for good faith negotiations attempting to resolve the dispute. If the executive officers (or their designees) are unable to resolve such dispute within [***] of such dispute first being referred to them for resolution, then either Party may avail itself to any other remedies it has at law or in equity, subject to Sections 19.1. The designated executive officers are as follows:

For HDPR:	CEO
For MAGENTA:	CEO

19.3 Assignment. Neither Party may assign this Agreement without the prior written consent of the other Party, which consent shall not be unreasonably withheld, conditioned or delayed, except that such consent shall not be required in connection with any assignment to (a) an Affiliate of the assigning Party or (b) a Third Party in connection with a sale or transfer of the business to which this Agreement relates or to any successor Person resulting from any merger or consolidation of such Party with or into such Person; provided that, with respect to each ((a)-(b)), the assignee shall have agreed in writing to assume all of the assignor's obligations hereunder; and provided, further, that the other Party shall be notified promptly after such assignment has been effected. In the event of a Change of Control of HDPR (other than through an internal restructuring of the companies comprising the dievini Group), HDPR or its successor shall perform a Non-GMP Partial Manufacturing Technology Transfer, a Non-GMP Full Manufacturing Technology Transfer or a GMP Full Manufacturing Technology Transfer, as requested by MAGENTA in writing, for the benefit of MAGENTA against payment of fees as set forth in this Agreement.

19.4 Independent Contractor. No employee or representative of either Party shall have any authority to bind or obligate the other Party to this Agreement for any sum or in any manner whatsoever or to create or impose any contractual or other liability on the other Party without said Party's prior written approval. For all purposes, and notwithstanding any other provision of this Agreement to the contrary, each Party's legal relationship to the other Party under this Agreement shall be that of independent contractor.

19.5 Unenforceable Provisions and Severability. If any of the provisions of this Agreement are held to be void or unenforceable, then such void or unenforceable provisions shall be replaced by valid and enforceable provisions that will achieve, as far as possible, the economic business intentions of the Parties. However, the remainder of this Agreement will remain in full force and effect; provided that the material interests of the Parties are not affected (i.e., the Parties would presumably have concluded this Agreement without the unenforceable provisions).

19.6 Waiver. The failure by either Party to require strict performance or observance of any obligation, term, provision or condition under this Agreement will neither constitute a waiver thereof nor affect in any way the right of the respective Party to require such performance and/or observance. The waiver by either Party of a breach of any obligation, term, provision or condition hereunder shall not constitute a waiver of any subsequent breach thereof or of any other obligation, term, provision or condition. No waiver of any obligation under or provision of this Agreement shall be valid or effective unless in writing and signed by each of the Parties.

19.7 Appendices. All Appendices to this Agreement shall form an integral part to this Agreement.

19.8 Amendments. No amendments of the terms and conditions of this Agreement shall be binding upon either Party hereto unless in writing and signed by both Parties.

19.9 Further Assurances. Each Party agrees to do and perform all such further acts and things and shall execute and deliver such other agreements, certificates, instruments and documents necessary or that the other Party may deem advisable in order to carry out the intent and accomplish the purposes of this Agreement and to evidence, perfect or otherwise confirm its rights hereunder.

19.10 Invoice Address. All invoices that are required or permitted hereunder shall be in writing and sent by HDPR to MAGENTA at the following address:

50 Hampshire St. – 8th floor
Cambridge, MA 02139 USA

19.11 Notice. All notices that are required or permitted hereunder shall be in writing and sufficient if delivered personally, sent by facsimile or electronic mail (and promptly confirmed by personal delivery, registered or certified mail or overnight courier), sent by nationally recognized overnight courier or sent by registered or certified mail, postage prepaid, return receipt requested, addressed as follows:

if to HDPR, to:	Heidelberg Pharma Research GmbH [***] Schreisheimer Strasse 101 68526 Ladenburg Germany [***]
And:	[***]
if to MAGENTA, to:	Magenta Therapeutics, Inc. 50 Hampshire St. 8th floor Cambridge, MA 02139 USA [***]
And:	[***]

or to such other address as the Party to whom notice is to be given may have furnished to the other Party in writing in accordance herewith. Any such notice shall be deemed delivered on the date received.

19.12 Rules of Construction. Headings and captions are for convenience only and are not be used in the interpretation of this Agreement. Each Party has had the opportunity to consult with counsel in connection with the review, drafting and negotiation of this Agreement. Accordingly, any rule of construction that any ambiguity in this Agreement shall be construed against the drafting Party shall not apply. In construing this Agreement (a) use of the singular includes the plural and vice versa; (b) "include" or "including" shall mean without limitation by reason of enumeration, (c) the words "herein", "hereof, "hereunder" and other words of similar import refer to this Agreement as a whole and not to any particular provision, (d) except where the context otherwise requires, the word "or" is used in the inclusive sense; and (e) the words "shall" and "will" will be construed as equivalents and neither word shall be deemed to be more permissive than the other. Accounting terms not otherwise defined herein have the meanings given to them in accordance with the applicable Accounting Standard.

19.13 Counterparts. This Agreement may be executed in counter-parts with the same effect as if both Parties had signed the same document. All such counterparts shall be deemed an original, shall be construed together and shall constitute one and the same instrument. Signatures to this Agreement transmitted by email in "portable document format" (".pdf), or by any other electronic means intended to preserve the original graphic and pictorial appearance of this Agreement shall have the same effect as physical delivery of the paper document bearing original signature.

[Signature pages follow.]

IN WITNESS WHEREOF, the Parties, acting through their duly authorized representatives, have entered into this Agreement as of the Effective Date.

Heidelberg Pharma Research GmbH

By:	/s/ Jan Schmidt-Brand	By:	/s/ Marcel Linssen
Name:	Dr. Jan Schmidt-Brand	Name:	Marcel Linssen
Title:	Chief Executive Officer	Title:	Chief Business Officer

Magenta Therapeutics, Inc.

By:	/s/ Jason Gardner	By:	/s/ Christina Isacson
Name:	Jason Gardner	Name:	Christina Isacson
Title:	CEO	Title:	CBO

[Signature Page to Exclusive Research, Development Option and License Agreement]

Appendix 1

RESEARCH PLAN

MAGENTA is currently developing four ADC profiles to address patient conditioning unmet needs in hematopoietic stem cell transplantation (HSCT). Lead antibodies to [***], have been evaluated. MAGENTA continues to evaluate tool antibodies to [***] and will launch antibody discovery campaigns to discover lead antibodies against these targets in early 2018. Through this Research Plan ("Plan") MAGENTA will continue to progress [***].

As part of this Plan HDPR will work with MAGENTA to provide [***].

Both MAGENTA and HDPR will discuss each parties' role in performing conjugations. Both parties will agree to a certain number of conjugation slots per quarter to be performed on behalf of MAGENTA at HDPR.

Target 1

MAGENTA plans to [***]. Through ongoing MTA agreements with HDPR, MAGENTA has made considerable progress in [***]. [***].

Estimated timelines and sequence of steps for Target 1 research plan are in the attached appendix and include the steps described below:

Step 1: Evaluation of alternate amanitin linker payloads ([***])

To allow full evaluation of HDPR's amanitin technology MAGENTA would like access to research quantities **[***].**

The following steps assume [***]. MAGENTA and HDPR to discuss potential of evaluating other linker payloads in parallel after Step 1 Evaluation phase.

Step 2: Developability Assessment ([***])

MAGENTA will require **[***]**. [***]. [***].

Rationale:

It is expected that [***]. All antibodies will be subjected to conjugation optimization followed by selecting conditions for scale up. ADCs will be characterized using above mentioned assays for binding, in-vitro/in-vivo studies, early formulation, developability and accelerated stability studies. It is expected that batch sizes will vary between [***] depending upon the scope of studies.

Step 3: Perform Demo Batches ([***])

To gain experience and inform selection of a CMO for GMP conjugation MAGENTA plans to perform demo batches at [***]. Each CMO will [***].

Rationale:

A reference standard will be prepared at MAGENTA which is expected to consume [***]. The reference standard will be used to generate analytical data that will serve as a standard for analytical results from CMOs. Each CMO will perform conjugation optimization which is expected to consume [***]. ADCs prepared at CMOs will be tested at MAGENTA for characterization and analysis.

The final decision for linker/payload is [***]. Change of linker will [***].

Step 4: Prepare [***]

MAGENTA plans to execute [***] to gain further understanding of the activity, toxicity and pharmacokinetic profile of our lead ADC. **[***]**. Conjugations performed at HDPR or MAGENTA at [***]. [***].

Step 5: Formulation and Process Development ([***])

MAGENTA requires **[***]**. [***]. Conjugation parameters [***] such as [***] will also be optimized. The optimized process will be expected to maintain [***]. A panel of formulations will also be developed to assess ADC stability. [***]. Buffers will be made with [***].

Step 6: Analytical Method Development ([***])

MAGENTA requires **[***]**. MAGENTA's analytical group has developed [***]. [***].

As Part of method development, MAGENTA will require [***].

Step 7: Process and Formulation Development at CMO ([***])

MAGENTA requires approximately **[***]**. Activities include [***].

Step 8: Tech transfer, method qualification / validation and release assays at CMOs ([***])

MAGENTA requires approximately **[***]**. Activities include [***].

Step 9: Engineering/GLP Tox Manufacturing ([***])

[***].

Step 10: GMP Manufacturing ([***])

[***].

Target 1 Timeline

[***]

Target 2 [***]

Step 1: Evaluation/Discovery Phase

MAGENTA is developing a second ADC against Target 2. Currently MAGENTA is [***].

Steps 2-10: Development Phase

Once a lead is identified for Target 2 ADC ([***].

Targets 3 and 4 [***]

Step 1: Evaluation/Discovery Phase

MAGENTA is [***].

Steps 2-10: Development Phase

[***].

Appendix 2

Service Cost List

[To be added after the Effective Date.]

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Appendix 3

Press Release*

(see Note to the Agreement at the end of the Press Release)

Magenta Therapeutics and Heidelberg Pharma Sign Exclusive Multi-Target Research Agreement for the Development of Antibody Drug Conjugates

- Collaboration enables and accelerates Magenta's research and development efforts across several targeted conditioning programs for bone marrow transplant
- Expands application of Heidelberg Pharma ATAC technology to new targets

Ladenburg, Germany, and Cambridge, MA, USA, xx February 2018—Heidelberg Pharma AG (FSE:WL6), a biotechnology company developing new options to address major challenges in cancer therapy, and Magenta Therapeutics Inc., a biotechnology company developing therapeutics to improve and extend the use of curative bone marrow transplant for more patients, today announced the signing of an exclusive multi-target research agreement. Heidelberg Pharma Research GmbH signed this collaboration, which will combine Magenta's stem cell platform with proprietary antibodies across up to four exclusive targets with Heidelberg Pharma's proprietary ATAC (Antibody Targeted Amanitin Conjugates) platform.

"There is a significant need for targeted conditioning regimens for bone marrow transplant, and this is a key area of focus for Magenta. Our partnership with Heidelberg Pharma is an important step in our development of proprietary targeted antibody drug conjugates for conditioning," said Michael Cooke, Ph.D., Chief Scientific Officer, Magenta Therapeutics. "Amanitin is one of the promising toxins we are exploring in our targeted conditioning programs, and our partnership with Heidelberg Pharma will allow us to fully evaluate the potential of this payload."

"We are delighted to collaborate with Magenta Therapeutics, a company at the forefront of transforming the field of bone marrow transplant medicine. We believe this partnership further validates our technology and underscores our leadership in the field of Antibody Targeted Amanitin Conjugates, a new mode of action for attacking cancer," said Andreas Pahl, Ph.D., Chief Scientific Officer, Heidelberg Pharma. "We look forward to working with Magenta to expand the application of our ATAC technology to new targets to potentially address unmet needs in bone marrow transplantation."

Under the terms of the multi-target research agreement, Magenta will have access to Heidelberg Pharma's Amanitin toxin-linker platform technology. Magenta has an option for an exclusive target-specific license for global development and commercialization rights to each of the product candidates resulting from the research collaboration.

Heidelberg Pharma will receive upfront technology access and exclusivity fees and payments for research support. Under the exclusive license agreement, Heidelberg Pharma would be eligible to receive option fees, clinical development, regulatory and sales-related milestone payments up to $334 million USD, if Magenta exercises all target options and all milestones are met.

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About Bone Marrow Transplant

Healthy bone marrow stem cells and the blood cells they create are crucial for survival, but certain diseases can affect the bone marrow, interfering with its ability to function properly. A bone marrow transplant is a process to replace unhealthy bone marrow with healthy bone marrow stem cells. Bone marrow transplant can save the lives of patients with blood cancers and genetic diseases and is a potential cure for patients with severe refractory autoimmune diseases. However, the high risks, toxic side effects and complexity of the procedure currently prevent many patients from being able to benefit.

About Heidelberg Pharma

Heidelberg Pharma is an oncology specialist and the first company to develop the toxin Amanitin into cancer therapies using its proprietary Antibody Targeted Amanitin Conjugate (ATAC) technology and to advance the biological mode of action of the toxin as a novel therapeutic principle. This proprietary technology platform is being applied to develop the Company's proprietary therapeutic ATACs as well as in third-party collaborations to create a variety of ATAC candidates. The proprietary lead candidate HDP-101 is a BCMA ATAC for multiple myeloma. ATAC technology is the core activity of subsidiary Heidelberg Pharma Research GmbH.

Heidelberg Pharma AG has entered into partnerships to further develop and commercialize its clinical assets MESUPRON® and REDECTANE®, while RENCAREX® is available for out-licensing and further development. The Company is listed on the Frankfurt Stock Exchange: ISIN DE000A11QW0 / WKN A11QW / Symbol WL6. More information is available at www.heidelberg-pharma.com.

About Magenta Therapeutics

Magenta Therapeutics is a biotechnology company developing therapeutics to revolutionize bone marrow transplant for patients with autoimmune diseases, blood cancers and genetic diseases. By creating a platform focused on critical areas of transplant medicine, Magenta Therapeutics is pioneering an integrated approach to extend the curative power of bone marrow transplant to more patients. Founded by internationally recognized leaders in bone marrow transplant medicine, Magenta Therapeutics was launched in 2016 by Third Rock Ventures and Atlas Venture and is headquartered in Cambridge, Mass. For more information, please visit www.magentatx.com.

Heidelberg Pharma AG
Sylvia Wimmer
Tel.: +49 89 41 31 38-29
Email: investors[at]hdpharma.com

Business Development
Dr. Marcel Linssen
CBO, Executive Vice President
Tel.: +49 6203 1009-40
Email: m.linssen[at]hdpharma.com

IR/PR support
MC Services AG
Katja Arnold (CIRO)
Managing Director & Partner
Tel.: +49 89-210 228-40
Email: katja.arnold[at]mc-services.eu

Magenta Therapeutics:
Manisha Pai,
Vice President, Communications & Investor Relations
857-242-1155
mpai@magentatx.com

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This communication contains certain forward-looking statements relating to the Company's business, which can be identified by the use of forward-looking terminology such as "estimates", "believes", "expects", "may", "will" "should" "future", "potential" or similar expressions or by a general discussion of the Company's strategy, plans or intentions. Such forward-looking statements involve known and unknown risks, uncertainties and other factors, which may cause our actual results of operations, financial condition, performance, or achievements, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements. Given these uncertainties, prospective investors and partners are cautioned not to place undue reliance on such forward-looking statements. We disclaim any obligation to update any such forward-looking statements to reflect future events or developments.

**Note to the Agreement: The order in which the Parties are mentioned the course of the press release may vary according to the Party issuing the press release.*

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Schedule 1.31

Initial Targets

[***]

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Schedule 1.36

Patent Rights

[***]

Schedule 6.1.1(c)(ii)

Know-How for Non-GMP Partial Manufacturing Technology Transfer

[***]

Schedule 6.1.2(b)

Know-How for Non-GMP Full Manufacturing Technology Transfer

[***]

Schedule 6.2.1(c)

Know-How for GMP Full Manufacturing Technology Transfer

[***]

Schedule 6.1.4

Pre-Clinical Supply Terms and Conditions

(a) General. In connection with HDPR's or its Third Party designee's supply of Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin to MAGENTA pursuant to Section 6.1.1, HDPR shall or shall cause its Third Party designee to manufacture and supply such Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin pursuant to the terms of this Agreement and the written specifications provided to HDPR from time to time. The JSC shall periodically review the specifications and make any necessary changes, including any changes required by Regulatory Authorities in countries where Regulatory Approval for the Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin has been approved or is pending.

(b) Orders; Delivery; Storage. MAGENTA will order Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin from HDPR in accordance with the terms of Section 6.1.1(c)(i). HDPR shall deliver Antibody-drug conjugate material, Amanitin Toxin Constructs and Amanitin in accordance with the terms of Section 6.1.1(c)(i). Orders may be amended only by mutual agreement of the Parties. HDPR shall store the Antibody-drug conjugate material, Amanitin Toxin Constructs or Amanitin in accordance with the specifications, any quality agreements entered into by the Parties and Applicable Law.

(c) Rejection. MAGENTA may reject any Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin that does not conform to the specifications, any quality agreements entered into by the Parties or Applicable Laws by providing written notice of such rejection to HDPR within [***]hereof; provided, however, that there shall be no time restrictions applicable to MAGENTA's provision of a notice of rejection of any shipments of Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin (or portion thereof) where any of the following have occurred or are present: (1) latent defects that are not reasonably discoverable by MAGENTA through standard inspection and testing; or (2) breach by HDPR of any of its representations or warranties set forth in subsection (e) hereof. MAGENTA shall promptly return any rejected Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin to HDPR at HDPR's expense and may elect, in its sole discretion, upon written notice to HDPR: (I) to have HDPR replace the rejected Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin as soon as practicable at no additional charge to MAGENTA (and in no case later than [***]); or (II) to not have HDPR replace the rejected Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin (or portions thereof) and, instead, have HDPR promptly reimburse MAGENTA (and in no case later than [***]) for any amounts that MAGENTA has already paid to HDPR for such rejected Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin (or portions thereof). If the Parties are unable to agree on whether any Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin was properly rejected by MAGENTA pursuant to this subsection (c), then such dispute will be resolved in accordance with Section 19.2.

(d) Destruction of Rejected Materials. Any Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin rejected by MAGENTA pursuant to subsection (c) shall be disposed of by HDPR in a manner that prevents theft and diversion and in accordance with Applicable Laws.

(e) Manufacturing Representations and Warranties. All Antibody-drug conjugate material, Amanitin Toxin Construct or Amanitin manufactured and supplied by HDPR or its designee under this Agreement shall:

(i) be manufactured, packaged, labeled, handled, stored and shipped in accordance with, shall be of the quality specified in, and shall conform to, this Agreement, the specifications, Applicable Laws and any quality agreements entered into by the Parties;

(ii) not contain any material that has not been used, handled or stored in accordance with this Agreement, the specifications, Applicable Laws and any quality agreements entered into by the Parties;

(iii) not be adulterated or misbranded within the meaning of Sections 501 and 502, respectively, of the FDCA and any other Laws;

(iv) be free from defects in material and workmanship; and

(v) at the time delivered, have a remaining shelf-life as specified in the applicable specifications set forth by the JSC.

SUBLEASE

THIS SUBLEASE AGREEMENT (this **"Sublease"),** made as of September 15, 2016 (the "Effective Date"), by and between SURFACE ONCOLOGY, INC., a Delaware corporation **("Sublessor"),** and MAGENTA THERAPEUTICS, INC., a Delaware corporation (hereinafter referred to as **"Sublessee");**

W I T N E S S E T H:

WHEREAS, pursuant to that certain Lease Agreement dated as of May 13, 2016 (the **"Prime Lease"),** BMR-HAMPSHIRE LLC **("Prime Lessor"),** as lessor, leases to Sublandlord, as lessee, a portion of the building located at 50 and 60 Hampshire Street (also known as 205 Broadway), Cambridge, Middlesex County, Massachusetts (the **"Premises"** or the **"Building"),** upon and subject to the terms and conditions set forth in the Overlease. A redacted copy of the Prime Lease is attached hereto as Exhibit A and made a part hereof; and

WHEREAS, Sublessee desires to sublease a portion of the Premises from Sublessor and Sublessor is willing to sublease the same, all on the terms and conditions hereinafter set forth.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties covenant and agree as follows:

1. Sublease of Subleased Premises. For the Rent (as defined herein) and upon the terms and conditions herein, Sublessor hereby subleases to Sublessee, and Sublessee hereby subleases from Sublessor the following space during the following periods during the Term (as defined herein) of this Sublease:

(a) Eighth Floor Premises. From the Commencement Date (as defined herein) through the Expiration Date, the Subleased Premises shall include only the approximately 12,437 rentable square feet of space described in Exhibit B which shall be referred to herein as the **"Subleased Premises".**

(b) During the term hereof, Sublessee shall have access to and use of the Subleased Premises twenty-four (24) hours a day, seven (7) days a week, subject to the terms of this Sublease.

2. Term; Condition of Premises. Subject to the following provisos, the term of this Sublease **("Term")** shall commence upon the later of (a) the date on which the Subleased Premises are tendered to Sublessee for its occupancy and use with the Sublessor's Work having been completed and (b) the date Sublessor delivers Prime Lessor's consent to this Sublease to Sublessee containing terms and conditions acceptable to Sublessee in its sole discretion (the later of (a) and (b), the **"Commencement Date"),** which is targeted for February 20, 2017 **("Sublease Target Commencement Date"),** and shall expire on the date that is eighteen (18) full calendar months after the Commencement Date (the **"Expiration Date"),** unless sooner terminated as set forth herein. Sublessor shall have no liability in the event there are any delays in the Commencement Date except that: (i) if Sublessor fails to complete the Sublessor's Work and deliver the Subleased Premises to Sublessee on or before the date that is sixty (60) days after the Sublease Target Commencement Date (as the same may be extended as set forth below), then for each day

thereafter until such time as the Subleased Premises are delivered to Sublessee with the Sublessor's Work complete, Sublessee shall receive a rent credit equal to one day's Base Rent and (ii) if Sublessor fails to complete the Sublessor's Work and deliver the Subleased Premises to Sublessee by the date that is one hundred twenty (120) days after the Sublease Target Commencement Date, the Sublessee may at any time thereafter terminate this Sublease upon written notice to Sublessor. Notwithstanding anything in this Sublease to the contrary, Sublessor's obligation to timely deliver the Subleased Premises on or before the Sublease Target Commencement Date shall be subject to extension on a day-for-day basis as a result of Force Majeure (as defined below), and Sublessor shall incur no liability under this Section for any delay caused by or any action or inaction of Sublessee or its contractors, agents or employees. Sublessor shall not be liable for the failure to furnish any utility or service, whether or not such failure is caused by accidents; breakage; casualties (to the extent not caused by the party claiming Force Majeure); Severe Weather Conditions (as defined below); physical natural disasters (but excluding weather conditions that are not Severe Weather Conditions); strikes, lockouts or other labor disturbances or labor disputes (other than labor disturbances and labor disputes resulting solely from the acts or omissions of the party claiming Force Majeure); acts of terrorism; riots or civil disturbances; wars or insurrections; shortages of materials (which shortages are not unique to the party claiming Force Majeure); government regulations, moratoria or other governmental actions, inactions or delays; failures by third parties to deliver gas, oil or another suitable fuel supply, or inability of the party claiming Force Majeure, by exercise of reasonable diligence, to obtain gas, oil or another suitable fuel; or other causes beyond the reasonable control of the party claiming that Force Majeure has occurred (collectively, **"Force Majeure")**; or, to the extent permitted by applicable laws, Sublessor's negligence. In the event of such failure, Sublessee shall not be entitled to termination of this Sublease or any abatement or reduction of Rent, nor shall Sublessee be relieved from the operation of any covenant or agreement of this Sublease. **"Severe Weather Conditions"** means weather conditions that are materially worse than those that reasonably would be anticipated for the Premises at the applicable time based on historic meteorological records.

(a) Subject to Sublessor's completion of the Sublessor's Work, the Subleased Premises shall be delivered by Sublessor and accepted by Sublessee in "as is" condition, except that the Subleased Premises shall be in broom clean condition, all the Subleased Premises shall be free of any and all personal property, occupancies and tenancies.

(c) Sublessor covenants to Sublessee that the Premises shall be in the same condition, in all material respects, on the Commencement Date as the Premises are in on the Effective Date, reasonable wear and tear excepted.

3. Appurtenant Rights.

(a) Sublessee shall have, as appurtenant to the Subleased Premises and without additional charge or cost, rights to use in common with Sublessor and others entitled thereto, Sublessor's rights in driveways, walkways, lobbies, hallways, the loading dock, freight elevators, stairways, passenger elevators convenient for access to the Subleased Premises and the other Common Areas as set forth in the Prime Lease and all in accordance with the terms of the Prime Lease.

4. Rent.

(a) Sublessee shall pay to Sublessor the following base rent for the Premises (the **"Base Rent").** The Base Rent and the Extra Rent (as defined below) shall be collectively referred to in this Sublease as the **"Rent".**

Lease Period	Monthly Installment of Base Rent	Annual Base Rent
Commencement Date - the date that is 12 full calendar months thereafter	$82,283.50	$ 987,402.00
Month 13 - Expiration Date	$84,752.01	$1,107,024.06

(b) Notwithstanding anything set forth herein to the contrary, Sublessee shall be responsible for paying, as **"Extra Rent,"** for the cost of Sublessee's pro rata share of the Additional Rent set forth in the Prime Lease that is required to be paid by Sublessor. Sublessee's pro rata share is 38.8%.

(c) Sublessee shall begin paying Rent to Sublessor on the Commencement Date (the **"Rent Commencement Date"),** and shall not owe Rent to Sublessor for any period prior to the Rent Commencement Date. All monthly payments of Rent and Extra Rent are due and payable in advance on the first day of each calendar month, without demand, deduction, counterclaim or setoff, except as set forth or incorporated herein. Rent for any partial month shall be prorated and paid on the first of such month. Sublessee shall make all payments required by this Sublease by wire transfer.

5. Permitted Uses. Sublessee shall use the Subleased Premises only for the Permitted Uses, and for all other uses as set forth in the Prime Lease. Sublessee shall not undertake any activities in the Subleased Premises unless and until Sublessee has complied with the Prime Lease, all applicable laws (including, but not limited to, having obtain all necessary federal, state or local permits and operating licenses) and insurance requirements.

6. Condition of Subleased Premises; Security; Alterations; Parking.

(a) Sublessee agrees that, except as expressly provided herein, (i) it enters into this Sublease without relying upon any representations, warranties or promises by Sublessor, its agents, representatives, employees, servants or any other person in respect of the Building or the Subleased Premises, except as specifically set forth in this Sublease, (ii) no rights, easements or licenses are acquired by Sublessee by implication or otherwise except as expressly set forth herein, (iii) Sublessor shall have no obligation to do any work in order to make the Subleased Premises suitable and ready for occupancy and use by Sublessee, other than as set forth in Exhibit D **("Sublessor's Work").**

(b) Sublessee shall be entitled to enter upon the Subleased Premises no more than fourteen (14) days prior to the Commencement Date, subject to the written approval of Sublessor, in Sublessor's reasonable discretion, to install its own security system in the Subleased Premises, and at the end of the Term, Sublessee shall remove such security system.

(c) Sublessee shall keep and maintain the Subleased Premises in at least the same order, repair and condition as exists on the Commencement Date, reasonable wear and tear and damage by fire or other casualty excepted.

(d) Sublessee shall not make any alterations, improvements, or renovations to the Subleased Premises without the prior written consent of Sublessor.

(e) During the Term of the Sublease, Sublessee shall be eligible to use 9 parking spaces allocated to Sublessor pursuant to the Prime Lease at the same cost per space as charged to Sublessor pursuant to the Prime Lease.

7. Insurance. Sublessee shall maintain throughout the Term of this Sublease such insurance in respect of the Subleased Premises and the conduct and operation of business therein, with Sublessor and Prime Lessor listed as additional insureds as is required of "Tenant" pursuant to the terms of the Prime Lease, with no penalty to Sublessor or Prime Lessor resulting from deductibles or self-insured retentions effected in Sublessee's insurance coverage. If Sublessee fails to procure or maintain such insurance and to pay all premiums and charges therefor within five (5) days after receipt of written notice from Sublessor, Sublessor may (but shall not be obligated to) do so, whereupon Sublessee shall reimburse Sublessor upon demand for such insurance premiums and charges and other reasonable costs incurred by Sublessor. All such Sublessee insurance policies shall, to the extent obtainable, contain endorsements providing that (i) such policies may not be canceled except upon thirty (30) days' prior notice to Sublessor and Prime Lessor, (ii) no act or omission of Sublessee shall affect or limit the obligations of the insurer with respect to any other named or additional insured and (iii) Sublessee shall be solely responsible for the payment of all premiums under such policies and Sublessor, notwithstanding that it is or may be a named insured, shall have no obligation for the payment thereof. On or before the Commencement Date, Sublessee shall deliver to Sublessor and Prime Lessor either a fully paid-for policy or certificate, at Sublessee's option, evidencing the foregoing coverages. Any endorsements to such policies or certificates shall also be delivered to Sublessor and Prime Lessor upon issuance thereof. Sublessee shall procure and pay for renewals of such insurance from time to time before the expiration thereof, and Sublessee shall deliver to Sublessor and Prime Lessor such renewal policies or certificates within thirty (30) days after the renewal date of any existing policy. In the event Sublessee fails to deliver any such renewal policy or certificate within thirty (30) days after the expiration of any existing policy, Sublessor shall have the right, but not the obligation, to obtain the same after five (5) days' written notice and opportunity to cure whereupon Sublessee shall reimburse Sublessor upon demand the fair market cost thereof.

Sublessee shall include in all such insurance policies any clauses or endorsements in favor of Prime Lessor including, but not limited to, waivers of the right of subrogation, which Sublessor is required to provide pursuant to the provisions of the Prime Lease. Sublessor and Sublessee shall also obtain from their respective insurers waivers of subrogation riders in favor of each other and hereby agree to release each other from all claims that may arise that are otherwise covered by insurance or if would have been covered by insurance that was required to be obtained either herein or in the Prime Lease. Sublessee releases and waives all claims against Sublessor for loss or damage to Sublessee's personal property and its alterations in the Subleased Premises.

8. Indemnification. Subject to Section **7** above and the obligation of each party to first look to insurance and except to the extent directly caused by the negligence or willful misconduct of Sublessor, Sublessee agrees to defend (with counsel reasonably approved by Sublessor), indemnify and hold Sublessor and its respective officers, agents and employees harmless from and against any and all claims, costs, expenses, losses and liabilities arising: (i) from the conduct or management of or from any work or thing whatsoever done in the Subleased Premises by or on behalf of Sublessee during the Term hereof; (ii) from any condition arising and any injury to or death of persons, damage to property or other event occurring in the Subleased Premises during the term hereof by or on behalf of Sublessee; and (iii) from any breach or default on the part of Sublessee in the performance of any covenant or agreement on the part of Sublessee to be performed pursuant to the terms of this Sublease or from any willful misconduct or negligence on the part of Sublessee or any of its agents, employees, licensees, invitees or assignees or any person claiming through or under Sublessee. Sublessee further agrees to indemnify Sublessor and Prime Lessor and their respective officers, agents and employees from and against any and all damages, liabilities, costs and expenses, including reasonable attorneys' fees, incurred in connection with any such indemnified claim or any action or proceeding brought in connection therewith. The provisions of this Paragraph are intended to supplement any other indemnification provisions contained in this Sublease and in the Prime Lease to the extent incorporated by reference herein. Any non-liability, indemnity or hold harmless provisions in the Prime Lease for the benefit of Prime Lessor that are incorporated herein by reference shall be deemed to inure to the benefit of Sublessor and Prime Lessor for the purpose of incorporation by reference in this Sublease.

9. No Assignment or Subletting. Sublessee shall not assign, sell, mortgage, pledge or in any manner transfer this Sublease or any interest herein, or the term or estate granted hereby or the rentals hereunder, or sublet the Subleased Premises or any part thereof, or grant any concession or license or otherwise permit occupancy of all or any part of the Subleased Premises by any person.

10. Primacy and Incorporation of Prime Lease.

(a) This Sublease is and shall be subject and subordinate to the Prime Lease and to all amendments, modifications and replacements of or to the Prime Lease, but only as such are permitted pursuant to this Sublease. Sublessor conveys, and Sublessee takes hereby, no greater rights then those accorded to or taken by Sublessor as "Tenant" under the terms of the Prime Lease, and likewise, except as set forth herein, is granted all benefits afforded "Tenant" under the Prime Lease. To the extent incorporated herein, Sublessee covenants and agrees that it will perform and observe all of the provisions contained in the Prime Lease to be performed and observed by the "Tenant" thereunder as applicable to the Subleased Premises, except that "Rent" shall be defined for purposes of this Sublease as set forth in Section 4 hereof. Notwithstanding the foregoing, Sublessee shall have no obligation to (i) cure any default of Sublessor under the Prime Lease, (ii) perform any obligation of Sublessor under the Prime Lease which arose prior to the Commencement Date and Sublessor failed to perform, (iii) repair any damage to the Subleased Premises caused by Sublessor, (iv) remove any alterations or additions installed within the Subleased Premises by or for Sublessor, or (v) indemnify Sublessor for any damages that directly result from any gross negligence or willful misconduct by Sublessor or its agents, employees or contractors. Except to the extent inconsistent with the context hereof, capitalized terms used and not otherwise defined herein shall have the meanings ascribed to them in the Prime Lease. Further,

except as set forth in the last paragraph of this Section (a), the terms, covenants and conditions of the Prime Lease are incorporated and made a part of this Sublease as they relate to the Subleased Premises as if such terms, covenants and conditions were stated herein to be the terms, covenants and conditions of this Sublease, so that except to the extent that they are inconsistent with or modified by the provisions of this Sublease, for the purpose of incorporation by reference, each and every referenced term, covenant and condition of the Prime Lease binding upon or inuring to the benefit of the "Landlord" thereunder shall, in respect of this Sublease and the Subleased Premises, be binding upon or inure to the benefit of Sublessor, and each and every referenced term, covenant and condition of the Prime Lease binding upon or inuring to the benefit of the "Tenant" thereunder shall, in respect of this Sublease, be binding upon or inure to the benefit of Sublessee, with the same force and effect as if such terms, covenants and conditions were completely set forth in this Sublease. It is the intent of the parties that to the extent any terms or provisions of this Sublease are inconsistent or conflict with the Prime Lease, the terms of this Sublease shall control and the applicable terms and provisions of the Prime Lease shall be deemed to be modified to reflect the terms and provisions of this Sublease. For purposes of this Sublease, as to such incorporated terms, covenants and conditions:

(i) references in the Prime Lease to the "Premises" shall be deemed to refer to the "Subleased Premises" hereunder;

(ii) references in the Prime Lease to "Landlord" and to "Tenant" shall be deemed to refer to "Sublessor" and "Sublessee" hereunder, respectively, except that where the term "Landlord" is used in the context of ownership or management of the entire Building, such term shall be deemed to mean "Prime Lessor";

(iii) references in the Prime Lease to "this Lease" shall be deemed to refer to "this Sublease" (except when such reference in the Prime Lease is, by its terms (unless modified by this Sublease), a reference to any other section of the Prime Lease, in which event such reference shall be deemed to refer to the particular section of the Prime Lease);

(iv) references in the Prime Lease to the "Term Commencement Date" shall be deemed to refer to the "Commencement Date" hereunder;

(v) references in the Prime Lease to "Term" shall be deemed to refer to the Term of this Sublease.

Sublessor shall have the rights against Sublessee as would be available to Landlord against the Tenant under the Prime Lease if such breach was by the Tenant thereunder. Sublessee shall have the same rights against Sublessor as would be available to Tenant against the Landlord under the Prime Lease if such breach was by the landlord thereunder.

(b) Notwithstanding the foregoing, the following provisions of the Prime Lease and Exhibits annexed thereto are not incorporated herein by reference and shall not, except as to definitions set forth therein, have any applicability to this Sublease:

Articles/Paragraphs/Sections 1, 2.1-2.6, 3, 4, 5, 7.1, 8, 9.6, 13.5, 16.8, 17, 29, 41, and 42.

(c) Notwithstanding anything to the contrary contained in the Prime Lease, the time limits (the **"Notice Periods")** contained in the Prime Lease for the giving of notices, making of demands or performing of any act, condition or covenant on the part of the "Tenant" thereunder, or for the exercise by the "Tenant" thereunder of any right, remedy or option, are changed for the purposes of incorporation herein by reference by shortening the same in each instance by five (5) days, so that in each instance Sublessee shall have five (5) fewer days to observe or perform hereunder than Sublessor has as the "Tenant" under the Prime Lease; provided, however, that if the Prime Lease allows a Notice Period of five (5) days or less, then Sublessee shall nevertheless be allowed the number of days equal to one-half of the number of days in each Notice Period to give any such notices, make any such demands, perform any such acts, conditions or covenants or exercise any such rights, remedies or options; provided, further, that if one-half of the number of days in the Notice Period is not a whole number, Sublessee shall be allowed the number of days equal to one-half of the number of days in the Notice Period rounded up to the next whole number.

11. Sublessor Representations. Notwithstanding anything to the contrary contained in this Sublease (including, without limitation, the provisions of the Prime Lease incorporated herein by reference), Sublessor makes no representations or warranties whatsoever with respect to the Subleased Premises, this Sublease, Prime Lease or any other matter, either express or implied, except as otherwise expressly set forth in this Sublease, except that Sublessor represents and warrants both as of the Effective Date as follows: (i) that it is the sole holder of the interest of the "Tenant" under the Prime Lease and holds good leasehold title to the Subleased Premises, (ii) that Sublessor has the legal power, right and authority to enter into this Sublease and the instruments referenced herein and to consummate the transactions contemplated hereby, and the individual(s) executing this Sublease and instruments referenced herein on behalf of Sublessor have the legal power, right, and authority to bind Sublessor to the terms and conditions hereof and that the Sublease is enforceable in accordance with its terms and is in full force and effect, (iii) that the Prime Lease is in full force and effect, (iv) there currently are no defaults or events of default under the Prime Lease, and there are no events which, with the passage of time and/or the giving of notice, would constitute a default or event of default under the Prime Lease, (v) to the best of Sublessor's knowledge, Prime Lessor is not in default under the Prime Lease, (vi) other than those that have been obtained and that are in full force and effect, the execution, delivery, and performance by Sublessor of this Sublease does not require the consent, waiver, approval, license, or authorization of, or any notice to or filing with, any person, entity, or governmental authority, except for the Consent, (vii) a true, accurate, and complete copy of the Prime Lease is attached hereto as Exhibit A, and there have been no modifications, amendments (including amendments to appendices) or changes to the Prime Lease, and the Prime Lease constitutes the entire agreement between Prime Lessor and Sublessor with regard to the Subleased Premises, (viii) Sublessor has no defenses, setoffs, or counterclaims to the payment of amounts due from Sublessor to Prime Lessor under the Prime Lease and no dispute currently exists under the Prime Lease, (ix) the execution and delivery of this Sublease will not conflict with or constitute a breach or default of any material terms of any note, contract, mortgage, deed of trust, lease, sublease, or other agreement or instrument to which Sublessor is a party or by which it is bound, (x) there are no actions, lawsuits, or proceedings pending or threatened against or relating to Sublessor's ownership or use of the Subleased Premises, and Sublessor has not received any written notice from any city, county, state, or other governmental agency claiming a violation of any applicable laws relating to the Subleased Premises, and (xi) Sublessor has not contracted for any services or goods or created any obligations that will bind Sublessee as successor-in-interest with respect to the Subleased Premises except as set forth in this Sublease.

12. Compliance with Prime Lease. Sublessee shall neither do nor permit anything to be done which would cause the Prime Lease to be terminated or forfeited by reason of any right of termination or forfeiture reserved or vested in Prime Lessor under the Prime Lease; provided, however, that this provision shall not require Sublessee to act or refrain from acting where otherwise permitted in this Sublease. Sublessee shall defend, indemnify and hold Sublessor harmless from and against any and all claims, liabilities, losses, damages, and expenses (including reasonable attorneys' fees) of any kind whatsoever by reason of any breach or default by Sublessee of this Section 12.

Sublessor shall neither do nor permit anything to be done which would cause the Prime Lease to be terminated or forfeited voluntarily or by reason of any right of termination or forfeiture reserved or vested in Prime Lessor under the Prime Lease; provided, however, that this provision shall not require Sublessor to act or refrain from acting where otherwise permitted in this Sublease. Sublessor shall defend, indemnify, and hold Sublessee harmless from and against any and all claims, liabilities, losses, damages, and expenses (including reasonable attorneys' fees) of any kind whatsoever by reason of any breach or default by Sublessor of this Section 12. Sublessor will not amend, alter or modify any of the provisions of the Prime Lease in a manner that increases the Rent or other amounts payable by Sublessee pursuant to this Sublease without, in each instance, Sublessee's consent in its sole and absolute discretion.

13. Security Deposit. Within two (2) business days after the Effective Date, Sublessee shall deposit with Sublessor the sum of $164,567.00 (the **"Security Deposit")** which sum shall be held by Sublessor as security for the faithful performance by Sublessee of all of the terms, covenants and conditions of this Sublease. The provisions of Section 11 of the Prime Lease shall govern the Security Deposit which may be paid either in cash or by the delivery by Sublessee of a Letter of Credit pursuant to Section 11 of the Prime Lease; provided that the Security Deposit shall be immediately returned to Sublessee upon written request by Sublessee if Prime Lessor does not provide its written Consent to this Sublease on or before the Sunset Date.

14. Brokerage. Sublessee and Sublessor each represents that it has not dealt with any broker in connection with this Sublease. Each party agrees to indemnify and hold harmless the other from and against any and all liabilities, claims, suits, demands, judgments, costs, interest, and expenses (including, without being limited to, reasonable attorneys' fees and expenses) which the indemnified party may be subject to or suffer by reason of any breach of the foregoing representations..

(a) **Notices.** All notices, consents, approvals, demands, bills, statements, and requests which are required or desired to be given by either party to the other hereunder shall be in writing and shall be governed by Section 24 of the Prime Lease as incorporated herein by reference.

(a) Address for Notices to Sublessor:

Prior to the Commencement Date:

Surface Oncology, Inc.
215 First Street
Cambridge, MA 02142
Attn: VP, Corporate Development

After the Commencement Date:

Surface Oncology, Inc.
50 Hampshire Street
Cambridge, MA 02139
Attn: VP, Corporate Development

(b) Address for Notices to Sublessee:

Prior to the Commencement Date:

Magenta Therapeutics, Inc.
245 First Street 4th Floor
Cambridge, MA 02142
Attn: Chief Operating Officer

After the Commencement Date:

Magenta Therapeutics, Inc.
50 Hampshire Street
Cambridge, MA 02139
Attn: Chief Operating Officer

15. Interpretation. This Sublease shall be construed without regard to any presumption or other rule requiring construction against the party causing this Sublease to be drafted. Each covenant, agreement, obligation or other provision of this Sublease shall be deemed and construed as a separate and independent covenant of the party bound by, undertaking or making the same, which covenant, agreement, obligation or other provision shall be construed and interpreted in the context of the Sublease as a whole. All terms and words used in this Sublease, regardless of the number or gender in which they are used, shall be deemed to include any other number and any other gender as the context may require. The word "person" as used in this Sublease shall mean a natural person or persons, a partnership, a corporation or any other form of business or legal association or entity. Terms used herein and not defined shall have the meaning set forth in the Prime Lease.

16. Signage. Sublessor shall obtain for Sublessee a Building-standard listing on the main Building lobby directory for Sublessee.

17. Right to Cure Defaults. If Sublessee or Sublessor shall at any time fail to make any payment or perform any other obligation pursuant to this Sublease, then the other shall have the right, but not the obligation, after notice to the defaulting party in accordance with Section 15 of this Sublease, or without notice to the other in the case of any emergency, and without waiving or releasing the other from any obligations of the other hereunder, to make such payment or

perform such other obligation of the other in such manner and to such extent as the non-defaulting party shall deem reasonably necessary, and in exercising any such right, to pay any incidental costs and expenses, employ attorneys, and incur and pay reasonable attorneys' fees. The defaulting party shall pay to the non-defaulting party ten (10) days after demand all reasonable sums so paid by the non-defaulting party and all incidental costs and expenses of the non-defaulting party in connection therewith, together with interest thereon at an annual rate equal to ten percent (10%) per annum, or the highest rate permitted by applicable law, whichever shall be less. Such interest shall be payable with respect to the period commencing on the date such expenditures are made by the non-defaulting party and ending on the date such amounts are repaid by the defaulting party. The provisions of this Paragraph shall survive the Expiration Date or the sooner termination of this Sublease.

18. Termination of Prime Lease. If for any reason the term of the Prime Lease shall terminate prior to the last day of the Term of this Sublease (as the case may be), this Sublease shall thereupon automatically terminate as to the premises demised under the Prime Lease and Sublessor shall not be liable to Sublessee by reason thereof except as otherwise set forth in this Sublease.

Neither Sublessor nor Sublessee shall do or permit anything to be done which would cause the Prime Lease to be terminated or forfeited by reason of any right of termination or forfeiture reserved or vested in Prime Lessor or in Sublessor under the Prime Lease Sublessor and Sublessee each shall defend, indemnify, and hold the other harmless from and against any and all claims, liabilities, losses, damages, and expenses (including reasonable attorneys' fees) of any kind whatsoever by reason of any breach or default on the part of Sublessor or Sublessee (as the case may be) by reason of which the Prime Lease may be terminated or forfeited.

Sublessor shall perform all of its obligations under the Prime Lease, and agrees to keep and maintain the Prime Lease in full force and effect. In the event that either Sublessor or Sublessee shall receive any notice from Prime Lessor regarding a default pursuant to any of the provisions of the Prime Lease, the party receiving such notice shall promptly give a copy thereof to the other party. Further, Sublessor and Sublessee each agrees to give to the other a copy of any notice of default, event of default, or otherwise under the Prime Lease that said party gives to Prime Lessor.

19. Sublessee Hazardous Material Activity.

(a) At all times during the Term, Sublessee shall maintain, at its sole cost and expense, environmental control and safety management services related to Sublessee's activities in the Subleased Premises (the **"EH&S Services").** The EH&S Services shall be provided by parties reasonable acceptable to Sublessor and in a manner reasonably acceptable to Sublessor.

(b) Without limiting the generality of Section 10, Sublessee shall (i) at all times during the Term, comply with the provisions of Section 21 regarding the storage and use of Hazardous Materials on the Subleased Premises, and (ii) prior to the expiration or termination of the Term, comply with the provisions of Section 26, including, but not limited to the preparation and execution of an Exit Plan (subject to prior approval by Sublessor and Prime Lessor).

20. Quiet Enjoyment. Sublessor covenants that if Sublessee is not in default beyond the expiration of any applicable notice and cure periods, then Sublessee shall quietly enjoy and occupy the full possession of the Subleased Premises without molestation or hindrance by Sublessor or any party claiming through Sublessor.

21. No Privity of Estate. Nothing contained in this Sublease shall be construed to create privity of estate or of contract between Sublessee and Prime Lessor.

22. No Waiver. The failure of either party to insist in any one or more cases upon the strict performance or observance of any obligation of the other party hereunder or to exercise any right or option contained herein shall not be construed as a waiver or relinquishment for the future performance of any such obligation of such party or any right or option of the other party. Sublessor's receipt and acceptance of Rent or Sublessor's acceptance of performance of any other obligation by Sublessee, with knowledge of Sublessee's breach of any provision of this Sublease, shall not be deemed a waiver of such breach. No waiver of any term, covenant or condition of this Sublease shall be deemed to have been made unless expressed in writing and signed by both parties.

23. Complete Agreement. This Sublease constitutes the entire agreement between the parties and there are no representations, agreements, arrangements or understandings, oral or written, between the parties relating to the subject matter of this Sublease which are not fully expressed in this Sublease. This Sublease cannot be changed or terminated orally or in any manner other than by a written agreement executed by both parties. This Sublease shall not be binding upon either party unless and until it is signed and delivered by and to both parties, and is further subject to Section 27.

24. Successors and Assigns. The provisions of this Sublease, except as herein otherwise specifically provided, shall extend to, bind, and inure to the benefit of the parties hereto and their respective personal representatives, heirs, successors, and permitted assigns.

25. Governing Law; Jurisdiction. This Sublease shall be construed in accordance with, and governed in all respects by, the laws of the Commonwealth of Massachusetts (without giving effect to principles of conflicts of laws that would require the application of any other law). Sublessor and Sublessee agree to submit to the jurisdiction of the state and federal courts located in the Commonwealth of Massachusetts, with venue in the County of Middlesex, and waive any defense of inconvenient forum to the maintenance of any action or proceeding in such courts.

26. Waiver of Jury Trial and Right to Counterclaim. The parties hereto hereby waive any rights which they may have to trial by jury in any summary action or other action, proceeding or counterclaim arising out of or in any way connected with this Sublease, the relationship of Sublessor and Sublessee, the Subleased Premises and the use and occupancy thereof, and any claim for injury or damages. Sublessee also hereby waives all right to assert or interpose a counterclaim (other than mandatory counterclaims) in any summary proceeding or other action or proceeding to recover or obtain possession of the Subleased Premises.

27. Consent of Prime Lessor. This Sublease is contingent on the approval and consent of Prime Lessor, which Sublessor agrees to use all reasonable efforts to obtain. This Sublease shall not become effective unless and until a written approval and consent (the **"Consent")** is executed and delivered by the Prime Lessor and Sublessee on terms and conditions satisfactory to Sublessee in its sole discretion. After the Sublessor receives the Consent as executed by Prime Lessor, Sublessor agrees to promptly deliver a fully executed original of the Consent to Sublessee. The effect and commencement of this Sublease is subject to and conditional upon the receipt by Sublessor and Sublessee of the Consent executed by Prime Lessor. Upon execution of this Sublease by Sublessee, Sublessor will promptly apply to the Prime Lessor for the Consent and Sublessor will promptly inform Sublessee as to receipt of the Consent (if and when it is received) and deliver to Sublessee a copy of the same.

If the Consent is not received within ten (10) business days after this Sublease is fully executed by both Sublessor and Sublessee (the "Sunset Date"), then from and after the Sunset Date this Sublease will cease to have any further effect and the parties hereto will have no further obligations to each other with respect to this Sublease and any funds paid hereunder by Sublessee shall be promptly refunded by Sublessor.

28. Holdover. If Sublessee remains in possession of either the Subleased Premises after the last day of the occupancy of such Subleased Premises as set forth in Section 1 (as the case may be) without the express written consent of Sublessor, (a) Sublessee shall become a tenant at sufferance upon the terms of this Sublease except that the monthly rental shall be equal to 150% of Rent in effect during the last 30 days of the Term, and (b) Sublessee shall be responsible for all damages suffered by Sublessor resulting from or occasioned by Sublessee's holding over, including consequential damages. No holding over by Sublessee, whether with or without consent of Sublessor, shall operate to extend this Sublease. Acceptance by Sublessor of Rent after the expiration of the Term or earlier termination of this Sublease shall not result in a renewal or reinstatement of this Sublease.

29. Recording. Sublessor and Sublessee agree that neither party may record this Sublease.

30. Public Statements. Neither party will make any public statements or releases concerning this Sublease, or use the other party's name in any form of advertising, promotion or publicity, without obtaining the prior written consent of the other party, which consent will not be unreasonably withheld or delayed.

31. Limitation of Liability. Notwithstanding any indemnities or other provisions hereof to the contrary, in no event shall Sublessor or Sublessee be responsible for any consequential, incidental, special or punitive damages, except as specifically set forth herein or in the Prime Lease.

32. Certain Definitions.

(a) All capitalized terms not defined in this Sublease shall have the meanings ascribed to them in the Prime Lease.

(b) The terms "herein", "hereunder", and "hereof" shall refer to this Sublease as a whole unless the context otherwise indicates.

33. Counterparts. This Sublease may be executed in multiple counterparts, each of which shall be deemed an original but all of which taken together shall constitute one and the same instrument. The undersigned may rely upon facsimile counterparts signed by each other, but shall promptly upon the request of the other exchange executed original signature pages.

34. Time is of the essence. Time is of the essence with respect to each provision of this Sublease.

35. Notwithstanding the foregoing, (a) Sublessor shall use good faith efforts, under the circumstances, to secure performance of Prime Lessor's obligations under the Prime Lease upon Sublessee's written request to Sublessor to do so and shall thereafter diligently prosecute such performance on the part of Prime Lessor and (b) if Sublessor shall be entitled to any abatement of rent by reason of any failure on the part of Prime Lessor to perform its obligations or to provide services to the Subleased Premises, Sublessee shall be entitled to a proportionate abatement of rent payable to Sublessor to the extent such abatement is actually made; provided, however, that Sublessee shall reimburse Sublessor for reasonable costs and expenses incurred by Sublessor in connection with such efforts. As long as this Sublease is in full force and effect, Sublessee shall be entitled, with respect to the Subleased Premises, to the benefit of Prime Lessor's obligations and agreements under the Prime Lease to furnish utilities and other services to the Subleased Premises and to repair and maintain the common areas, roof, building systems and all other obligations of Prime Lessor under the Master Lease.

36. Notwithstanding anything contained in this Sublease to the contrary, Sublessee shall not be responsible for (i) any default of Sublessor, its agents, employees or contractors under the Prime Lease unless attributable to a default under this Sublease or the Prime Lease by Sublessee, its agents, employees, contractors, invitees or anyone claiming by, through or under Sublessee, (ii) conditions at the Subleased Premises, for which the obligation to maintain and repair resides with Prime Lessor under the Prime Lease and/or which existed as of the Commencement Date, (iii) any violations of law resulting from such conditions described by (ii) above, (iv) the payment of any charges, fees and other costs imposed by Prime Lessor on Sublessor as a result of Sublessor's default under the Prime Lease (unless due to any default by Sublessee under this Sublease), and (v) making payment of any sums either to Prime Lessor or Sublessor in satisfaction of any charges accruing under the Prime Lease (whether denominated as rent, rental, additional rent or otherwise) for any period prior or subsequent to the Term of this Sublease.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, Sublessor and Sublessee have executed this Sublease as a sealed instrument as of the date first written above.

SUBLESSOR:

SURFACE ONCOLOGY, INC.

By: /s/ Detlev Biniszkiewicz

Name: Detlev Biniszkiewicz

Title: CEO & President

SUBLESSEE:

MAGENTA THERAPEUTICS, INC.

By: /s/ Bastiano Sanna

Name: Bastiano Sanna

Title: Chief Operating Officer

EXHIBIT A

PRIME LEASE

See attached.

LEASE

by and between

BMR-HAMPSHIRE LLC,
a Delaware limited liability company

and

SURFACE ONCOLOGY, INC.,
a Delaware corporation

BioMed Realty form dated 2/10/16

APPROVED
BIOMED REALTY LEGAL

Table of Contents

LEASE

THIS LEASE (this "Lease") is entered into as of this 13th day of May, 2016 (the "Execution Date"), by and between BMR-HAMPSHIRE LLC, a Delaware limited liability company ("Landlord"), and SURFACE ONCOLOGY, INC., a Delaware corporation ("Tenant").

RECITALS

A. WHEREAS, Landlord owns certain real property and improvements located at 50 and 60 Hampshire Street (also known as 205 Broadway), Cambridge, Middlesex County, Massachusetts (the "Property"), including the buildings located thereon; and

B. WHEREAS, Landlord wishes to lease to Tenant, and Tenant desires to lease from Landlord, certain premises (the "Premises") located on the eighth (8th) floor of the building known as 50 Hampshire Street (the "Building"), pursuant to the terms and conditions of this Lease, as detailed below.

AGREEMENT

NOW, THEREFORE, Landlord and Tenant, in consideration of the mutual promises contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound, agree as follows:

1. Lease of Premises. Effective on the Term Commencement Date (as defined below), Landlord hereby leases to Tenant, and Tenant hereby leases from Landlord, the Premises, as shown on Exhibit A attached hereto for use by Tenant in accordance with the Permitted Use (as defined below) and no other uses. The portion of the Property commonly known as 50 Hampshire Street and all landscaping, parking facilities, private drives and other improvements and appurtenances related thereto, including the Building, are hereinafter collectively referred to as the "Project." The portion of the Property commonly known as 60 Hampshire Street and all landscaping, parking facilities, private drives and other improvements and appurtenances related thereto, including the building located thereon (the "60 Building"), are hereinafter collectively referred to as the "60 Project" and, together with the Project, the "Hampshire Project." All portions of the Building that are for the non-exclusive use of the tenants of the Building only, and not the tenants of the Hampshire Project generally, such as service corridors, stairways, elevators, public restrooms and public lobbies (all to the extent located in the Building), are hereinafter referred to as "Building Common Area." All portions of the 60 Building that are for the non-exclusive use of the tenants of the 60 Building only, and not the tenants of the Hampshire Project generally, such as service corridors, stairways, elevators, public restrooms and public lobbies (all to the extent located in the 60 Building), are hereinafter referred to as "60 Building Common Area." All portions of the Hampshire Project that are for the non-exclusive use of tenants of the Hampshire Project generally, including driveways, sidewalks, parking areas, landscaped areas, and (to the extent not located in a building) service corridors, stairways, elevators, public restrooms and public lobbies (but excluding the Building Common Area and the 60 Building Common Area), are hereinafter referred to as "Hampshire Project Common Area." The Building Common Area and the Hampshire Project Common Area are collectively referred to herein as "Common Area." The "Laboratory Building" consists of the floors and areas within the Building that serve (or are capable of serving) laboratory uses.

2. Basic Lease Provisions. For convenience of the parties, certain basic provisions of this Lease are set forth herein. The provisions set forth herein are subject to the remaining terms and conditions of this Lease and are to be interpreted in light of such remaining terms and conditions.

2.1. This Lease shall take effect upon the Execution Date and, except as specifically otherwise provided within this Lease, each of the provisions hereof shall be binding upon and inure to the benefit of Landlord and Tenant from the date of execution and delivery hereof by all parties hereto.

2.2. In the definitions below, Rentable Area (as defined below) is expressed in square feet. Rentable Area and "Tenant's Pro Rata Shares" (i.e., Pro Rata Share of Building and Pro Rata Share of Laboratory Building) are all subject to adjustment as provided in this Lease.

Definition or Provision	Means the Following (As of the Term Commencement Date)
Approximate Rentable Area of Premises	32,018 square feet
Approximate Rentable Area of Building	202,023 square feet
Tenant's Pro Rata Share of Building	15.85%
Approximate Rentable Area of Laboratory Building	97,757 square feet
Tenant's Pro Rata Share of Laboratory Building	32.75%

2.3. Monthly and annual installments of Base Rent for the Premises ("Base Rent") as of the Rent Commencement Date (as defined below), subject to adjustment under this Lease:

Dates	Square Feet of Rentable Area	Base Rent per Square Foot of Rentable Area	Monthly Base Rent	Annual Base Rent
Rent Commencement Date – First (1st) Anniversary of the Term Commencement Date	32,018	[redacted]		

2.4. Estimated Term Commencement Date: February 20, 2017

2.5. Estimated Term Expiration Date: February 19, 2027

2.6. Security Deposit: [redacted] subject to increase in accordance with the terms hereof.

2.7. Permitted Use: Office and laboratory use in conformity with all federal, state, municipal and local laws, codes, ordinances, rules and regulations of Governmental Authorities (as defined below), committees, associations, or other regulatory committees, agencies or governing bodies having jurisdiction over the Premises, the Building, the Property, the Project, Landlord or Tenant, including both statutory and common law and hazardous waste rules and regulations ("Applicable Laws")

2.8. Address for Rent Payment:

BMR-Hampshire LLC
Attention Entity 325
P.O. Box 511415
Los Angeles, California 90051-7970

2.9. Address for Notices to Landlord:

BMR-Hampshire LLC
17190 Bernardo Center Drive
San Diego, California 92128
Attn: Real Estate Legal Department

2.10. Address for Notices to Tenant:

Prior to the Term Commencement Date:

Surface Oncology, Inc.
215 First Street
Cambridge, MA 02142
Attn: Jessica Fees

After the Term Commencement Date:

Surface Oncology, Inc.
50 Hampshire Street
Cambridge, MA 02139
Attn: Jessica Fees

2.11. Address for Invoices to Tenant:

Prior to the Term Commencement Date:

Surface Oncology, Inc.
215 First Street
Cambridge, MA 02142
Attn: Jessica Fees

After the Term Commencement Date:

Surface Oncology, Inc.
50 Hampshire Street
Cambridge, MA 02139
Attn: Jessica Fees

2.12. The following Exhibits are attached hereto and incorporated herein by reference:

Exhibit A	Premises
Exhibit B	Work Letter
Exhibit B, Attch. 1	Schedule
Exhibit B, Attch. 2	Approved Schematic Plans
Exhibit B, Attch. 3	Budget
Exhibit B-1	Tenant Work Insurance Schedule
Exhibit B-2	Landlord's Work
Exhibit C	Acknowledgement of Term Commencement Date and Term Expiration Date
Exhibit D	Plan of Lab and Office Zones
Exhibit E	Form of Letter of Credit
Exhibit F	Rules and Regulations
Exhibit G	PTDM
Exhibit H	Tenant's Personal Property
Exhibit I	Form of Estoppel Certificate

3. Term. The actual term of this Lease (as the same may be extended pursuant to Article 42 hereof, and as the same may be earlier terminated in accordance with this Lease, the "Term") shall commence on the Term Commencement Date (as defined in Article 4) and end on the date (the "Term Expiration Date") that is one hundred twenty (120) months after the Term Commencement Date, subject to extension or earlier termination of this Lease as provided herein.

4. Possession and Commencement Date.

4.1. Landlord shall use commercially reasonable efforts to tender possession of the Premises to Tenant on the Estimated Term Commencement Date, with the work (the "Tenant Improvements") required of Landlord described in the Work Letter attached hereto as Exhibit B (the "Work Letter") and the light laboratory base Building improvements described in Exhibit B- 2 (the "Landlord's Work") Substantially Complete (as defined below). If Landlord has failed to Substantially Complete the Tenant Improvements and the Landlord's Work on or prior to the date that is sixty (60) days after the Estimated Term Commencement Date (as the same may be

extended pursuant to the last sentence of this Section 4.1), then Tenant shall be entitled to one (1) day of abatement of Base Rent for every day after the Estimated Term Commencement Date that Substantial Completion of Tenant Improvements and the Landlord's Work has not occurred. Any such Base Rent abatement shall be credited against the Base Rent due from Tenant following the Rent Commencement Date (as hereinafter defined). Tenant agrees that in the event such work is not Substantially Complete on or before the Estimated Term Commencement Date for any reason, then (a) this Lease shall not be void or voidable, (b) Landlord shall not be liable to Tenant for any loss or damage resulting therefrom, (c) the Term Expiration Date shall be extended accordingly and (d) Tenant shall not be responsible for the payment of any Base Rent or Tenant's Adjusted Share of Operating Expenses (as defined below) or Tenant's Adjusted Share of Laboratory Support Expenses (as defined below) until the actual Term Commencement Date as described in Section 4.2 occurs. Notwithstanding the foregoing, if Landlord has failed to Substantially Complete the Tenant Improvements on or prior to the date that is one hundred twenty (120) days after the Estimated Term Commencement Date (as the same may be extended pursuant to the last sentence of this Section 4.1), then this Lease may be terminated by Tenant by written notice to Landlord given no later than thirty (30) days following such date, and if so terminated by Tenant: (a) the Security Deposit shall be returned to Tenant in accordance with Article 11 hereof, and (b) neither Landlord nor Tenant shall have any further rights, duties or obligations under this Lease, except with respect to the terms and provisions of this Lease that expressly survive the expiration or earlier termination of this Lease; provided, however, that any such termination notice shall be null and void and no longer of any force and effect if Landlord Substantially Completes the Tenant Improvements and Landlord's Work within forty-five (45) days after receipt of such termination notice. The term "Substantially Complete" or "Substantial Completion" means that (a) the Tenant Improvements are substantially complete in accordance with the Approved Plans (as defined in the Work Letter) as reasonably determined by Landlord's architect, except for minor punch list items, (b) the Landlord's Work is substantially complete, as reasonably determined by Landlord's architect, except for minor punch list items, and (c) Landlord has received a certificate of occupancy (which may include a temporary certificate of occupancy) from the City of Cambridge for the Premises. Notwithstanding anything in this Lease (including the Work Letter) to the contrary, Landlord's obligation to timely achieve Substantial Completion on the Estimated Term Commencement Date shall be subject to extension on a day-for-day basis as a result of Force Majeure (as defined below), and Landlord shall incur no liability under this Section 4.1 for any delay caused by or any action or inaction of Tenant or its contractors, agents or employees.

4.2. The "Term Commencement Date" shall be the day Landlord tenders possession of the Premises to Tenant with the Tenant Improvements Substantially Complete. If possession is delayed by action of Tenant, then the Term Commencement Date shall be the date that the Term Commencement Date would have occurred but for such delay. Tenant shall execute and deliver to Landlord written acknowledgment of the actual Term Commencement Date and the Term Expiration Date within ten (10) days after Tenant takes occupancy of the Premises, in the form attached as Exhibit C hereto. Failure to execute and deliver such acknowledgment, however, shall not affect the Term Commencement Date or Landlord's or Tenant's liability hereunder. Failure by Tenant to obtain validation by any medical review board or other similar governmental licensing of the Premises required for the Permitted Use by Tenant shall not serve to extend the Term Commencement Date.

4.3. Tenant shall be entitled to enter upon the Premises during the sixty (60) day period prior to the Term Commencement Date (or such earlier period with respect to tel/data installations), subject to the written approval of Landlord, in Landlord's reasonable discretion, for the sole purposes of installing improvements and/or the placement of personal property such as, furniture, IT cabling, security systems, and laboratory equipment. Tenant agrees that it shall be reasonable for Landlord to withhold its approval pursuant to the immediately foregoing sentence if Landlord reasonably determines that any such early access by Tenant will interfere with Landlord's construction of the Tenant Improvements or Landlord's Work. In the event that Landlord permits (in Landlord's sole and absolute discretion) Tenant to enter upon the Premises prior to the Term Commencement Date for the purpose of installing improvements or the placement of personal property, Tenant shall furnish to Landlord evidence satisfactory to Landlord in advance that insurance coverages required of Tenant under the provisions of Article 23 are in effect, and such entry shall be subject to all the terms and conditions of this Lease other than the payment of Base Rent; and provided, further, that if the Term Commencement Date is delayed due to such early access, then the Term Commencement Date shall be the date that the Term Commencement Date would have occurred but for such delay.

4.4. Landlord shall cause the Tenant Improvements to be constructed in the Premises pursuant to the Work Letter at a cost to Landlord not to exceed [redacted] (as defined below) (the "TI Allowance"). The TI Allowance may be applied to the costs of (m) construction, (n) project management by Landlord (which fee shall equal three percent (3%) of the cost of the Tenant Improvements, including the TI Allowance), (o) commissioning of mechanical, electrical and plumbing systems by a licensed, qualified commissioning agent hired by Landlord, and review of such party's commissioning report by a licensed, qualified commissioning agent hired by Tenant, (p) space planning, architect, engineering and other related services performed by third parties unaffiliated with Tenant, (q) building permits and other taxes, fees, charges and levies by Governmental Authorities (as defined below) for permits or for inspections of the Tenant Improvements, and (r) costs and expenses for labor, material, equipment and fixtures. In no event shall the TI Allowance be used for (w) payments to Tenant or any affiliates of Tenant, (x) the purchase of any furniture, personal property or other non-building system equipment, (y) costs resulting from any default by Tenant of its obligations under this Lease or (z) costs that are recoverable by Tenant from a third party (e.g., insurers, warrantors, or tortfeasors).

4.5. Tenant shall have until July 1, 2017 (the "TI Deadline"), to expend the unused portion of the TI Allowance, after which date Landlord's obligation to fund such costs shall expire.

4.6. In no event shall any unused TI Allowance entitle Tenant to a credit against Rent payable under this Lease.

4.7. Notwithstanding anything to the contrary in this Lease, Landlord and Tenant agree that all Tenant Improvements shall (a) be programmed in accordance with the lab and office zones identified on Exhibit D attached hereto, and (b) incorporate flexible lab bench systems. The portion of the Premises that is programmed for laboratory uses is defined herein as the "Lab Zone" and the portion of the Premises that is programmed for office uses is defined herein as the "Office Zone".

5. Condition of Premises Landlord represents to Tenant that, on the date on which Landlord delivers the Premises to Tenant with the Tenant Improvements Substantially Complete, all base building systems within the Premises, including the HVAC (as hereinafter defined), electrical, life safety and plumbing systems, shall be in good working order (provided that the sole remedy for any breach of the foregoing representation shall be that Landlord shall repair or remedy the violation of the foregoing representation at its sole cost, provided that Landlord may include the costs thereof in Operating Expenses or Laboratory Support Expenses to the extent that Landlord is permitted to do so under Article 9 below, and Tenant shall not be entitled to any monetary damages for any breach of such representation). Except as set forth in the immediately foregoing sentence, Tenant acknowledges that neither Landlord nor any agent of Landlord has made any representation or warranty with respect to the condition of the Premises, the Building or the Project, or with respect to the suitability of the Premises, the Building or the Project for the conduct of Tenant's business. Tenant acknowledges that (a) it is fully familiar with the condition of the Premises and agrees to take the same in its condition "as is" as of the Term Commencement Date and (b) Landlord shall have no obligation to alter, repair or otherwise prepare the Premises for Tenant's occupancy or to pay for or construct any improvements to the Premises, except for performance of the Tenant Improvements and Landlord's Work. Tenant's taking of possession of the Premises shall, except as otherwise agreed to in writing by Landlord and Tenant, conclusively establish that the Premises, the Building and the Project were at such time in good, sanitary and satisfactory condition and repair.

6. Rentable Area.

6.1. The term "Rentable Area" shall reflect such areas as reasonably calculated by Landlord's architect, as the same may be reasonably adjusted from time to time by Landlord in consultation with Landlord's architect to reflect changes to the Premises, the Building, the Laboratory Building, or the Project, as applicable, including (with respect to the Laboratory Building) due to the conversion of space in the Building to increase the space serving (or capable of serving) laboratory uses.

6.2. The Rentable Area of the Building is generally determined by making separate calculations of Rentable Area applicable to each floor within the Building and totaling the Rentable Area of all floors within the Building. The Rentable Area of a floor is computed by measuring to the outside finished surface of the permanent outer Building walls. The full area calculated as previously set forth is included as Rentable Area, without deduction for columns and projections or vertical penetrations, including stairs, elevator shafts, flues, pipe shafts, vertical ducts and the like, as well as such items' enclosing walls.

6.3. The term "Rentable Area," when applied to the Premises, is that area equal to the usable area of the Premises, plus an equitable allocation of Rentable Area within the Building that is not then utilized or expected to be utilized as usable area, including that portion of the Building devoted to corridors, equipment rooms, restrooms, elevator lobby, atrium and mailroom.

6.4. The Rentable Area of the Hampshire Project is the total Rentable Area of all buildings within the Hampshire Project.

6.5. Review of allocations of Rentable Areas as between tenants of the Building, the Laboratory Building and the Hampshire Project shall be made as frequently as Landlord deems appropriate, including in order to facilitate an equitable apportionment of Operating Expenses (as defined below) and Laboratory Support Expenses (as defined below). If such review is by a licensed architect and allocations are certified by such licensed architect as being correct, then Tenant shall be bound by such certifications.

7. Rent.

7.1. Tenant shall pay to Landlord as Base Rent for the Premises, commencing on the date that is two (2) months after the Term Commencement Date (the "Rent Commencement Date"), the sums set forth in Section 2.3, subject to the rental adjustments provided in Article 8 hereof. Base Rent shall be paid in equal monthly installments as set forth in Section 2.3, subject to the rental adjustments provided in Article 8 hereof, each in advance on the first day of each and every calendar month during the Term.

7.2. In addition to Base Rent, Tenant shall pay to Landlord as additional rent ("Additional Rent") at times hereinafter specified in this Lease (a) Tenant's Adjusted Share (as defined below) of Operating Expenses (as defined below), (b) Tenant's Adjusted Share of Laboratory Support Expenses, (c) the Property Management Fee (as defined below), and (d) any other amounts that Tenant assumes or agrees to pay under the provisions of this Lease that are owed to Landlord, including any and all other sums that may become due by reason of any default of Tenant or failure on Tenant's part to comply with the agreements, terms, covenants and conditions of this Lease to be performed by Tenant, after notice and the lapse of any applicable cure periods.

7.3. Base Rent and Additional Rent shall together be denominated "Rent." Rent shall be paid to Landlord, without abatement, deduction or offset, in lawful money of the United States of America to the address set forth in Section 2.8 or to such other person or at such other place as Landlord may from time designate in writing. In the event the Term commences or ends on a day other than the first day of a calendar month, then the Rent for such fraction of a month shall be prorated for such period on the basis of the number of days in the month and shall be paid at the then-current rate for such fractional month.

7.4. Tenant's obligation to pay Rent shall not be discharged or otherwise affected by (a) any Applicable Laws now or hereafter applicable to the Premises, (b) any other restriction on Tenant's use, (c) except as expressly provided herein, any casualty or taking or (d) any other occurrence; and Tenant waives all rights now or hereafter existing to terminate or cancel this Lease or quit or surrender the Premises or any part thereof, or to assert any defense in the nature of constructive eviction to any action seeking to recover rent. Tenant's obligation to pay Rent with respect to any period or obligations arising, existing or pertaining to the period prior to the date of the expiration or earlier termination of the Term or this Lease shall survive any such expiration or earlier termination; provided, however, that nothing in this sentence shall in any way affect Tenant's obligations with respect to any other period.

8. Rent Adjustments. Base Rent shall be subject to an annual upward adjustment of three percent (3%) of the then-current Base Rent. The first such adjustment shall become effective commencing on the first (1st) annual anniversary of the Term Commencement Date, and subsequent adjustments shall become effective on every successive annual anniversary for so long as this Lease continues in effect.

9. Operating Expenses and Laboratory Support Expenses.

9.1. As used herein, the term "Operating Expenses" shall include:

(a) Government impositions, including property tax costs consisting of real and personal property taxes (including amounts due under any improvement bond upon the Building or the Project (including the parcel or parcels of real property upon which the Building, and areas serving the Building and the Project are located)) or assessments in lieu thereof imposed by any federal, state, regional, local or municipal governmental authority, agency or subdivision (each, a "Governmental Authority"), but excluding any such impositions or assessments on Base Building Laboratory Support Systems (as hereinafter defined), if such amounts are imposed or assessed separately by a Governmental Authority; taxes on or measured by gross rentals received from the rental of space in the Project; taxes based on the square footage of the Premises, the Building or the Project, as well as any parking charges, utilities surcharges or any other costs levied, assessed or imposed by, or at the direction of, or resulting from Applicable Laws or interpretations thereof, promulgated by any Governmental Authority in connection with the use or occupancy of the Project or the parking facilities serving the Project; taxes on this transaction or any document to which Tenant is a party creating or transferring an interest in the Premises; any fee for a business license to operate an office building; and any expenses, including the reasonable cost of attorneys or experts, reasonably incurred by Landlord in seeking reduction by the taxing authority of the applicable taxes, less tax refunds obtained as a result of an application for review thereof; and

(b) All other costs of any kind paid or incurred by Landlord in connection with the operation or maintenance of the Building and the Project (other than Laboratory Support Expenses), which shall include (i) Project office rent at fair market rental for a commercially reasonable amount of space for Project management personnel, to the extent an office used for Project operations is maintained at the Project, plus customary expenses for such office, and costs of repairs and replacements to improvements within the Project as appropriate to maintain the Project as required hereunder, including costs of funding such reasonable reserves as Landlord, consistent with good business practice, may establish to provide for future repairs and replacements, or as any Lender (as defined below) may require; costs of utilities furnished to the Common Area; sewer fees; cable television; trash collection; cleaning, including windows; heating, ventilation and air-conditioning ("HVAC"); maintenance of landscaping and grounds; snow removal; maintenance of drives and parking areas; maintenance of the roof; security services and devices; building supplies; maintenance or replacement of equipment utilized for operation and maintenance of the Project; license, permit and inspection fees; sales, use and excise taxes on goods and services purchased by Landlord in connection with the operation, maintenance or repair of the Building or Project systems and equipment; telephone, postage, stationery supplies and other expenses incurred in connection with the operation, maintenance or repair of the Project; accounting, legal and other professional fees and expenses incurred in

connection with the Project; costs of furniture, draperies, carpeting, landscaping supplies, snow removal and other customary and ordinary items of personal property provided by Landlord for use in Common Area or in the Project office; capital expenditures but only to the extent permitted in Section 9.1(c) below; costs of complying with Applicable Laws (except to the extent such costs are incurred to remedy non-compliance as of the Execution Date with Applicable Laws); costs to keep the Project in compliance with, or costs or fees otherwise required under or incurred pursuant to any CC&Rs (as defined below), including condominium fees; insurance premiums, including premiums for commercial general liability, property casualty, earthquake, terrorism and environmental coverages; portions of insured losses paid by Landlord as part of the deductible portion of a loss pursuant to the terms of insurance policies; service contracts; costs of services of independent contractors retained to do work of a nature referenced above; and costs of compensation (including employment taxes and fringe benefits) of all persons who perform regular and recurring duties connected with the day-to-day operation and maintenance of the Project, its equipment, the adjacent walks, landscaped areas, drives and parking areas, including janitors, floor waxers, window washers, watchmen, gardeners, sweepers, plow truck drivers, handymen, and engineering/maintenance/facilities personnel.

(c) Notwithstanding the foregoing, Operating Expenses shall not include any net income, franchise, capital stock, estate or inheritance taxes, or taxes that are the personal obligation of Tenant or of another tenant of the Project or any penalties, fines and interest incurred by reason of Landlord's failure to timely pay any taxes or other impositions of a Governmental Authority; any leasing commissions; expenses (including attorney fees and court costs) incurred in connection with (i) negotiations or disputes with tenants of the Property or other occupants or prospective tenants or other occupants, (ii) the enforcement of any leases or (iii) the defense of Landlord's title to, or interest in, the Project, the Building or any part thereof; costs (including permit, license, and inspection fees) incurred in connection with preparing rental space for a tenant, that relate to preparation of rental space for a tenant or for any subsequent improvements Landlord performs for any other tenant in such tenant's premises; expenses of initial development and construction, including grading, paving, landscaping and decorating (as distinguished from maintenance, repair and replacement of the foregoing); Landlord's costs of any services provided to tenants or other occupants for which Landlord is actually reimbursed by such tenants or other occupants (other than reimbursement through Operating Expenses) as an additional charge or rental over and above the basic rent (and escalations thereof) payable under the lease with such tenant or other occupant; capital expenditures, except for those incurred (A) in replacing obsolete equipment, (B) for the primary purpose of reducing Operating Expenses, or (C) required to comply with changes in Applicable Laws that take effect after the Execution Date of the Lease, in each case amortized over the useful life thereof (but in no event more than seven (7) years), as reasonably determined by Landlord; costs (i.e., interest and penalties) incurred due to Landlord's default of this Lease or any other lease, mortgage, or other agreement, in each case affecting the Project, the Building or Property; payments to subsidiaries or affiliates of Landlord, or to any other party, in each case as a result of a non-arm's length transaction, for management or other services for the Building, or for supplies or other materials for the Building, to the extent that such payments exceed arm's length competitive prices in the Cambridge, Massachusetts market for the services, supplies or materials provided; Landlord's legal existence and general corporate overhead and general administrative expenses; legal expenses relating to other tenants; costs of repairs to the extent reimbursed by payment of insurance proceeds received by Landlord; advertising and promotional expenditures directly related to Landlord's efforts to lease space in

the Building; the cost of repairs or other work occasioned by fire, windstorm, or other insured casualty, to the extent Landlord actually receives proceeds of such insurance for such repairs or other work; debt service; interest upon loans to Landlord or secured by a mortgage or deed of trust covering the Project or a portion thereof or any other debt of Landlord (provided that interest upon a government assessment or improvement bond payable in installments shall constitute an Operating Expense under Subsection 9.1(a)); rental payments under any ground lease; salaries of employees of Landlord above those performing property management and facilities management duties at the Building; legal and accounting fees not incurred in connection with operation and management of the Building, (including any legal and other costs incurred in connection with the sale, financing, refinancing, syndication, securitization, or change of ownership of the Building, including, without limitation, brokerage commissions, attorneys' and accountants' fees, closing costs, title insurance premiums, points, and interest charges); salaries of executive officers of Landlord; depreciation claimed by Landlord for tax purposes (provided that this exclusion of depreciation is not intended to delete from Operating Expenses actual costs of repairs and replacements and reasonable reserves in regard thereto that are provided for in Subsection 9.1(b)); costs or expenses incurred in connection with the financing or sale of the Project, the Building or any portion thereof; costs expressly excluded from Operating Expenses elsewhere in this Lease or that are charged to or paid by Tenant under other provisions of this Lease; professional fees and disbursements and other costs and expenses related to the ownership (as opposed to the use, occupancy, operation, maintenance or repair) of the Project; political and charitable contributions; costs of environmental testing, monitoring, removal or remediation of any Hazardous Materials in the Building or the Property (other than disposal and recycling of Hazardous Materials customarily found in the operation and use of comparable buildings, such as cleaning supplies) that are in existence at the Building or the Property prior to the Term Commencement Date except to the extent caused by Tenant or a Tenant Party (as defined below); and any item that, if included in Operating Expenses, would involve a double collection for such item by Landlord. To the extent that Tenant uses more than Tenant's Pro Rata Share of Building of any item of Operating Expenses or Tenant's Pro Rata Share of Laboratory Building of any Laboratory Support Expenses, as the case may be, Tenant shall pay Landlord for such excess in addition to Tenant's obligation to pay Tenant's Pro Rata Share of Building of Operating Expenses and Tenant's Pro Rata Share of Laboratory Building (or Tenant's Occupied Lab Share (as hereinafter defined) if applicable) of Laboratory Support Expenses, as the case may be (such excess, together with Tenant's Pro Rata Share of Building of Operating Expenses or Tenant's Pro Rata Share of Laboratory Building (or Tenant's Occupied Lab Share if applicable) of Laboratory Support Expenses, as the case may be, "Tenant's Adjusted Share").

9.2. As used herein, the term "Base Building Laboratory Support Systems" means all base Building systems, fixtures and equipment exclusively serving the laboratory uses in the Building that are shared (or capable of being shared) by tenants or other occupants in the Building that are permitted to use and occupy premises in the Building for laboratory uses, including but not limited to the following base Building systems: (i) vacuum and compressed air; (ii) purified water and (iii) laboratory waste water treatment, each with respect to the portion of such system that extends to the isolation valve for such system that serves the Premises.

"Laboratory Support Expenses" shall include:

(a) Government impositions, including property tax costs consisting of real and personal property taxes (including amounts due under any improvement bond upon the Building or the Project (including the parcel or parcels of real property upon which the Building, and areas serving the Building and the Project are located)) or assessments in lieu thereof imposed by any Governmental Authority separately on any Base Building Laboratory Support Systems or reasonably determined by Landlord to be attributable to any Base Building Laboratory Support Systems and not other portions of the Project; and

(b) All other costs of any kind paid or incurred by Landlord in connection with the operation or maintenance of the Base Building Laboratory Support Systems and the provision of services that exclusively serve the Laboratory Building, which shall include costs of repairs and replacements to Base Building Laboratory Support Systems, including costs of funding such reasonable reserves as Landlord, consistent with good business practice, may establish to provide for future repairs and replacements, or as any Lender (as defined below) may require; costs of utilities furnished to the Base Building Laboratory Support Systems; sewer fees; HVAC; maintenance or replacement of equipment utilized for operation and maintenance of the Base Building Lab Systems; license, permit and inspection fees; sales, use and excise taxes on goods and services purchased by Landlord in connection with the operation, maintenance or repair of the Base Building Laboratory Support Systems; other expenses incurred in connection with the operation, maintenance or repair of the Base Building Laboratory Support Systems; accounting, legal and other professional fees and expenses incurred in connection with the Base Building Laboratory Support Systems; capital expenditures related to Base Building Laboratory Support Systems; costs of complying with Applicable Laws (except to the extent such costs are incurred to remedy non-compliance as of the Execution Date with Applicable Laws); costs to keep the Base Building Laboratory Support Systems in compliance with, or costs or fees otherwise required under or incurred pursuant to any CC&Rs (as defined below), including insurance premiums attributable to Base Building Laboratory Support Systems, including premiums for commercial general liability, property casualty, earthquake, terrorism and environmental coverages; portions of insured losses to Base Building Laboratory Support Systems paid by Landlord as part of the deductible portion of a loss pursuant to the terms of insurance policies; service contracts; costs of services of independent contractors retained to do work of a nature referenced above; and costs of compensation (including employment taxes and fringe benefits) of all persons who perform regular and recurring duties connected with the day-to-day operation and maintenance of Base Building Laboratory Support Systems.

9.3. Tenant shall pay to Landlord on the first day of each calendar month of the Term, as Additional Rent, (a) the Property Management Fee (as defined below), (b) Landlord's estimate of Tenant's Adjusted Share of Operating Expenses with respect to the Building and the Project, and (c) Landlord's estimate of Tenant's Adjusted Share of Laboratory Support Expenses, as applicable, for such month.

(w) The "Property Management Fee" shall equal [redacted]t. Tenant shall pay the Property Management Fee in accordance with Section 9.3 with respect to the entire Term, including any extensions thereof or any holdover periods, regardless of whether Tenant is obligated to pay Base Rent, Operating Expenses, Laboratory Support Expenses or any other Rent with respect to any such period or portion thereof. [redacted]

[redacted]

(x) Within ninety (90) days after the conclusion of each calendar year (or such longer period as may be reasonably required by Landlord), Landlord shall furnish to Tenant a statement showing in reasonable detail the actual Operating Expenses and Laboratory Support Expenses, Tenant's Adjusted Share of Operating Expenses and Laboratory Support Expenses, and the cost of providing utilities to the Premises for the previous calendar year ("Landlord's Statement"). Any additional sum due from Tenant to Landlord shall be due and payable within thirty (30) days after receipt of an invoice therefor. If the amounts paid by Tenant pursuant to this Section exceed Tenant's Adjusted Share of Operating Expenses and Tenant's Adjusted Share of Laboratory Support Expenses for the previous calendar year, then Landlord shall credit the difference against the Rent next due and owing from Tenant; provided that, if the Lease term has expired, Landlord shall accompany Landlord's Statement with payment for the amount of such difference.

(y) Any amount due under this Section for any period that is less than a full month shall be prorated for such fractional month on the basis of the number of days in the month.

9.4. Landlord's annual statement shall be final and binding upon Tenant unless Tenant, within sixty (60) days after Tenant's receipt thereof, shall contest any item therein by giving written notice to Landlord, specifying each item contested and the reasons therefor; provided that Tenant shall in all events pay the amount specified in Landlord's annual statement, pending the results of the Independent Review and determination of the Accountant(s), as applicable and as each such term is defined below. If, during such sixty (60)-day period, Tenant reasonably and in good faith questions or contests the correctness of Landlord's statement of Tenant's Adjusted Share of Operating Expenses or Laboratory Support Expenses, Landlord shall provide Tenant with reasonable access to Landlord's books and records to the extent relevant to determination of Operating Expenses or Laboratory Support Expenses, and such information as Landlord reasonably determines to be responsive to Tenant's written inquiries. In the event that, after Tenant's review of such information, Landlord and Tenant cannot agree upon the amount of Tenant's Adjusted Share of Operating Expenses or Laboratory Support Expenses, then Tenant shall have the right to have an independent public accounting firm hired by Tenant on an hourly basis and not on a contingent-fee basis (at Tenant's sole cost and expense) and approved by Landlord (which approval Landlord shall not unreasonably withhold or delay) audit and review such of Landlord's books and records for the year in question as directly relate to the determination of Operating Expenses or Laboratory Support Expenses for such year (the "Independent Review"), but not books and records of entities other than Landlord. Landlord shall make such books and records available at the location where Landlord maintains them in the ordinary course of its business. Landlord need not provide copies of any books or records. Tenant shall commence the Independent Review within fifteen (15) days after the date Landlord has given Tenant access to Landlord's books and records for the Independent Review. Tenant shall complete the Independent Review and notify Landlord in writing of Tenant's specific objections to Landlord's calculation of Operating Expenses or Laboratory Support Expenses (including Tenant's accounting firm's written statement of the basis, nature and amount of each

proposed adjustment) no later than sixty (60) days after Landlord has first given Tenant access to Landlord's books and records for the Independent Review. Landlord shall review the results of any such Independent Review. The parties shall endeavor to agree promptly and reasonably upon Operating Expenses or Laboratory Support Expenses taking into account the results of such Independent Review. If, as of the date that is sixty (60) days after Tenant has submitted the Independent Review to Landlord, the parties have not agreed on the appropriate adjustments to Operating Expenses, then the parties shall engage a mutually agreeable independent third party accountant with at least ten (10) years' experience in commercial real estate accounting in the Cambridge, Massachusetts area (the "Accountant"). If the parties cannot agree on the Accountant, each shall within ten (10) days after such impasse appoint an Accountant (different from the accountant and accounting firm that conducted the Independent Review) and, within ten (10) days after the appointment of both such Accountants, those two Accountants shall select a third (which cannot be the accountant and accounting firm that conducted the Independent Review). If either party fails to timely appoint an Accountant, then the Accountant the other party appoints shall be the sole Accountant. Within ten (10) days after appointment of the Accountant(s), Landlord and Tenant shall each simultaneously give the Accountants (with a copy to the other party) its determination of Operating Expenses or Laboratory Support Expenses, with such supporting data or information as each submitting party determines appropriate. Within ten (10) days after such submissions, the Accountants shall by majority vote select either Landlord's or Tenant's determination of Operating Expenses or Laboratory Support Expenses. The Accountants may not select or designate any other determination of Operating Expenses or Laboratory Support Expenses. The determination of the Accountant(s) shall bind the parties. If the parties agree or the Accountant(s) determine that the Operating Expenses or Laboratory Support Expenses actually paid by Tenant for the calendar year in question exceeded Tenant's obligations for such calendar year, then Landlord shall, at Tenant's option, either (a) credit the excess to the next succeeding installments of estimated Additional Rent or (b) pay the excess to Tenant within thirty (30) days after delivery of such results. If the parties agree or the Accountant(s) determine that Tenant's payments of Operating Expenses or Laboratory Support Expenses for such calendar year were less than Tenant's obligation for the calendar year, then Tenant shall pay the deficiency to Landlord within thirty (30) days after delivery of such results. If the Independent Review reveals or the Accountant(s) determine that the Operating Expenses or Laboratory Support Expenses billed to Tenant by Landlord and paid by Tenant to Landlord for the applicable calendar year in question exceeded by more than five percent (5%) what Tenant should have been billed during such calendar year, then Landlord shall pay the reasonable cost of the Independent Review. In all other cases, Tenant shall pay the cost of the Independent Review. In all instances, Tenant shall pay the cost of the Accountant(s).

9.5. Landlord may, from time to time, modify Landlord's calculation and allocation procedures for Operating Expenses and Laboratory Support Expenses, subject to any exclusions therefrom specified in Sections 9.1 and 9.2, so long as such modifications produce Dollar results substantially consistent with Landlord's then-current practice at the Project. Landlord or an affiliate(s) of Landlord currently own other property(ies) adjacent to the Project or its neighboring properties, including the 60 Project (which is part of the Property) (collectively, "Neighboring Properties"). In connection with Landlord performing services for the Project pursuant to this Lease, similar services may be performed by the same vendor(s) for Neighboring Properties. In such a case, or in the case of any real estate or personal property taxes or other impositions or taxes charged or assessed by a Governmental Authority for the Hampshire Project

as a whole, Landlord shall reasonably allocate to each building and the Project the costs for such services based upon the ratio that the square footage of the building or the Project (as applicable) bears to the total square footage of all of the Neighboring Properties or buildings within the Neighboring Properties for which the services are performed, unless the scope of the services performed for any building or property (including the Building and the Project) is disproportionately more or less than for others, in which case Landlord shall equitably allocate the costs based on the scope of the services being performed for each building or property (including the Building and the Project). For clarity, in the case of any Operating Expenses (including without limitation real estate or personal property taxes or other impositions or taxes charged or assessed by a Governmental Authority for the Hampshire Project as a whole) that apply to the Hampshire Project as a whole (as opposed to allocated specifically to each of the Project and the 60 Project or to each of the Building and the 60 Building), Landlord shall reasonably allocate to the Project and the 60 Project the costs of such Operating Expenses based upon the ratio that the square footage of Rentable Area of each of the Building and the 60 Building, respectively, bears to the total square footage of Rentable Area of all of the buildings in the Hampshire Project, or such other equitable allocation as Landlord reasonably determines.

9.6. Tenant shall not be responsible for Operating Expenses and Laboratory Support Expenses with respect to any time period prior to the Term Commencement Date; provided, however, that if Landlord shall permit Tenant possession of the Premises prior to the Term Commencement Date, Tenant shall be responsible for Operating Expenses and Laboratory Support Expenses from such earlier date of possession (the Term Commencement Date or such earlier date, as applicable, the "Expense Trigger Date"); and provided, further, that Landlord may annualize certain Operating Expenses and Laboratory Support Expenses incurred prior to the Expense Trigger Date over the course of the budgeted year during which the Expense Trigger Date occurs, and Tenant shall be responsible for the annualized portion of such Operating Expenses and Laboratory Support Expenses corresponding to the number of days during such year, commencing with the Expense Trigger Date, for which Tenant is otherwise liable for Operating Expenses and Base Building Laboratory Support Systems Expenses pursuant to this Lease. Tenant's responsibility for Tenant's Adjusted Share of Operating Expenses and Laboratory Support Expenses shall continue to the latest of (a) the date of termination of the Lease, (b) the date Tenant has fully vacated the Premises and (c) if termination of the Lease is due to a default by Tenant, the date of rental commencement of a replacement tenant.

9.7. Operating Expenses and Laboratory Support Expenses for the calendar year in which Tenant's obligation to share therein commences and for the calendar year in which such obligation ceases shall be prorated on a basis reasonably determined by Landlord. Expenses such as taxes, assessments and insurance premiums that are incurred for an extended time period shall be prorated based upon the time periods to which they apply so that the amounts attributed to the Premises relate in a reasonable manner to the time period wherein Tenant has an obligation to share in Operating Expenses and Laboratory Support Expenses.

9.8. Within thirty (30) days after the end of each calendar month, Tenant shall submit to Landlord an invoice, or, in the event an invoice is not available, an itemized list, of all costs and expenses that (a) Tenant has incurred (either internally or by employing third parties) during the prior month and (b) for which Tenant reasonably believes it is entitled to reimbursements from Landlord pursuant to the terms of this Lease or that Tenant reasonably believes is the responsibility of Landlord pursuant to this Lease or the Work Letter.

9.9. In the event that the Building or Project is less than fully occupied during a calendar year, Tenant acknowledges that Landlord may extrapolate Operating Expenses and Laboratory Support Expenses that vary depending on the occupancy of the Building or Project, as applicable, to equal Landlord's reasonable estimate of what such Operating Expenses or Laboratory Support Expenses, as the case may be, would have been had the Building or Project, as applicable, been ninety-five percent (95%) occupied during such calendar year; provided, however, that Landlord shall not recover more than one hundred percent (100%) of Operating Expenses and Laboratory Support Expenses.

10. Taxes on Tenant's Property.

10.1. Tenant shall be solely responsible for the payment of any and all taxes levied upon (a) personal property and trade fixtures located at the Premises and (b) any gross or net receipts of or sales by Tenant, and shall pay the same at least twenty (20) days prior to delinquency.

10.2. If any such taxes on Tenant's personal property or trade fixtures are levied against Landlord or Landlord's property or, if the assessed valuation of the Building, the Property or the Project is increased by inclusion therein of a value attributable to Tenant's personal property or trade fixtures, and if Landlord, after written notice to Tenant, pays the taxes based upon any such increase in the assessed value of the Building, the Property or the Project, then Tenant shall, upon demand, repay to Landlord the taxes so paid by Landlord.

10.3. If any improvements in or alterations to the Premises, whether owned by Landlord or Tenant and whether or not affixed to the real property so as to become a part thereof, are assessed for real property tax purposes at a valuation higher than the valuation at which improvements conforming to Landlord's building standards (the "Building Standard") in other spaces in the Building are assessed, then the real property taxes and assessments levied against Landlord or the Building, the Property or the Project by reason of such excess assessed valuation shall be deemed to be taxes levied against personal property of Tenant and shall be governed by the provisions of Section 10.2. Any such excess assessed valuation due to improvements in or alterations to space in the Project leased by other tenants at the Project shall not be included in Operating Expenses. If the records of the applicable governmental assessor's office are available and sufficiently detailed to serve as a basis for determining whether such Tenant improvements or alterations are assessed at a higher valuation than the Building Standard, then such records shall be binding on both Landlord and Tenant.

11. Security Deposit.

11.1. Tenant shall deposit with Landlord on or before the Execution Date the sum set forth in Section 2.6 (the "Security Deposit"), which sum shall be held by Landlord as security for the faithful performance by Tenant of all of the terms, covenants and conditions of this Lease to be kept and performed by Tenant during the period commencing on the Execution Date and ending upon the expiration or termination of Tenant's obligations under this Lease. If Tenant Defaults (as defined below) with respect to any provision of this Lease, including any provision

relating to the payment of Rent, then Landlord may (but shall not be required to) use, apply or retain all or any part of the Security Deposit for the payment of any Rent or any other sum in default, or to compensate Landlord for any other loss or damage that Landlord may suffer by reason of Tenant's default. If any portion of the Security Deposit is so used or applied, then Tenant shall, within ten (10) days following demand therefor, deposit cash with Landlord in an amount sufficient to restore the Security Deposit to its original amount, and Tenant's failure to do so shall be a material breach of this Lease. The provisions of this Article shall survive the expiration or earlier termination of this Lease.

11.2. In the event of bankruptcy or other debtor-creditor proceedings against Tenant, the Security Deposit shall be deemed to be applied first to the payment of Rent and other charges due Landlord for all periods prior to the filing of such proceedings.

11.3. Landlord may deliver to any purchaser of Landlord's interest in the Premises the funds deposited hereunder by Tenant, and thereupon Landlord shall be discharged from any further liability with respect to such deposit. This provision shall also apply to any subsequent transfers.

11.4. If Tenant shall fully and faithfully perform every provision of this Lease to be performed by it, then the Security Deposit, or any balance thereof, shall be returned to Tenant (or, at Landlord's option, to the last assignee of Tenant's interest hereunder) within thirty (30) days after the expiration or earlier termination of this Lease.

11.5. If the Security Deposit shall be in cash, Landlord shall hold the Security Deposit in an account at a banking organization selected by Landlord; provided, however, that Landlord shall not be required to maintain a separate account for the Security Deposit, but may intermingle it with other funds of Landlord. Landlord shall be entitled to all interest and/or dividends, if any, accruing on the Security Deposit. Landlord shall not be required to credit Tenant with any interest for any period during which Landlord does not receive interest on the Security Deposit.

11.6. The Security Deposit may be in the form of cash, a letter of credit or any other security instrument acceptable to Landlord in its sole discretion. Tenant may at any time, except when Tenant is in Default (as defined below), deliver a letter of credit (the "L/C Security") as the entire Security Deposit, as follows:

(a) If Tenant elects to deliver L/C Security, then Tenant shall provide Landlord, and maintain in full force and effect throughout the Term and until the date that is four (4) months after the then-current Term Expiration Date, a letter of credit in the form of Exhibit E, or such other form that Landlord may approve in its sole discretion, issued by an issuer reasonably satisfactory to Landlord, in the amount of the Security Deposit, with an initial term of at least one year. Landlord may require the L/C Security to be re-issued by a different issuer at any time during the Term if Landlord reasonably believes that the issuing bank of the L/C Security is or may soon become insolvent; provided, however, Landlord shall return the existing L/C Security to the existing issuer immediately upon receipt of the substitute L/C Security. If any issuer of the L/C Security shall become insolvent or placed into FDIC receivership, then Tenant shall immediately deliver to Landlord (without the requirement of notice from Landlord) substitute L/C Security issued by an issuer reasonably satisfactory to Landlord, and otherwise

conforming to the requirements set forth in this Article. As used herein with respect to the issuer of the L/C Security, "insolvent" shall mean the determination of insolvency as made by such issuer's primary bank regulator (i.*e.*, the state bank supervisor for state chartered banks; the OCC or OTS, respectively, for federally chartered banks or thrifts; or the Federal Reserve for its member banks). If, at the Term Expiration Date, any Rent remains uncalculated or unpaid, then (i) Landlord shall with reasonable diligence complete any necessary calculations, (ii) Tenant shall extend the expiry date of such L/C Security from time to time as Landlord reasonably requires and (iii) in such extended period, Landlord shall not unreasonably refuse to consent to an appropriate reduction of the L/C Security. Tenant shall reimburse Landlord's legal costs (as estimated by Landlord's counsel) in handling Landlord's acceptance of L/C Security or its replacement or extension.

(b) If Tenant delivers to Landlord satisfactory L/C Security in place of the entire Security Deposit, Landlord shall remit to Tenant any cash Security Deposit Landlord previously held.

(c) Landlord may draw upon the L/C Security, and hold and apply the proceeds in the same manner and for the same purposes as the Security Deposit, if (i) an uncured Default (as defined below) exists, (ii) as of the date that is forty-five (45) days before any L/C Security expires (even if such scheduled expiry date is after the Term Expiration Date) Tenant has not delivered to Landlord an amendment or replacement for such L/C Security, reasonably satisfactory to Landlord, extending the expiry date to the earlier of (1) four (4) months after the then-current Term Expiration Date or (2) the date that is one year after the then-current expiry date of the L/C Security, (iii) the L/C Security provides for automatic renewals, Landlord asks the issuer to confirm the current L/C Security expiry date, and the issuer fails to do so within ten (10) business days, (iv) Tenant fails to pay (when and as Landlord reasonably requires) any bank charges for Landlord's transfer of the L/C Security or (v) the issuer of the L/C Security ceases, or announces that it will cease, to maintain an office in the city where Landlord may present drafts under the L/C Security (and fails to permit drawing upon the L/C Security by overnight courier or facsimile). This Section does not limit any other provisions of this Lease allowing Landlord to draw the L/C Security under specified circumstances.

(d) Tenant shall not seek to enjoin, prevent, or otherwise interfere with Landlord's draw under L/C Security, even if it violates this Lease. Tenant acknowledges that the only effect of a wrongful draw would be to substitute a cash Security Deposit for L/C Security, causing Tenant no legally recognizable damage. Landlord shall hold the proceeds of any draw in the same manner and for the same purposes as a cash Security Deposit. In the event of a wrongful draw, (a) the parties shall cooperate to allow Tenant to post replacement L/C Security simultaneously with the return to Tenant of the wrongfully drawn sums, (b) Landlord shall upon request confirm in writing to the issuer of the L/C Security that Landlord's draw was erroneous, and (c) if Tenant receives a final determination from a court of competent jurisdiction that is not subject to appeal that Landlord has made a "wrongful" draw, (i) Landlord shall pay Tenant interest upon the amount of such wrongful draw at the rate of twelve percent (12%) and (ii) Tenant shall be entitled to recover its reasonable attorney's fees in accordance with Section 40.7. For purposes of the immediately foregoing sentence, the term "wrongful" shall mean that Landlord had no reasonable basis to believe that it had the right to make the draw.

(e) If Landlord transfers its interest in the Premises, then Tenant shall at Tenant's expense, within five (5) business days after receiving a request from Landlord, deliver (and, if the issuer requires, Landlord shall consent to) an amendment to the L/C Security naming Landlord's grantee as substitute beneficiary. If the required Security Deposit changes while L/C Security is in force, then Tenant shall deliver (and, if the issuer requires, Landlord shall consent to) a corresponding amendment to the L/C Security.

12. Use.

12.1. Tenant shall use the Premises for the Permitted Use, and shall not use the Premises, or permit or suffer the Premises to be used, for any other purpose without Landlord's prior written consent, which consent Landlord may withhold in its sole and absolute discretion.

12.2. Tenant shall not use or occupy the Premises in violation of Applicable Laws; zoning ordinances; or the certificate of occupancy issued for the Building or the Project, and shall, upon five (5) days' written notice from Landlord, discontinue any use of the Premises that is declared or claimed by any Governmental Authority having jurisdiction to be a violation of any of the above, or that in Landlord's reasonable opinion violates any of the above. Tenant shall comply with any direction of any Governmental Authority having jurisdiction that shall, by reason of the nature of Tenant's use or occupancy of the Premises, impose any duty upon Tenant or Landlord with respect to the Premises or with respect to the use or occupation thereof, and shall indemnify, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold Landlord and its affiliates, employees, agents and contractors; and any lender, mortgagee, ground lessor or beneficiary (each, a "Lender" and, collectively with Landlord and its affiliates, employees, agents and contractors, the "Landlord Indemnitees") harmless from and against any and all demands, claims, liabilities, losses, costs, expenses, actions, causes of action, damages, suits or judgments, and all reasonable expenses (including reasonable attorneys' fees, charges and disbursements, regardless of whether the applicable demand, claim, action, cause of action or suit is voluntarily withdrawn or dismissed) incurred in investigating or resisting the same (collectively, "Claims") of any kind or nature that arise before, during or after the Term as a result of Tenant's breach of this Section.

12.3. Tenant shall not do or permit to be done anything that will invalidate or increase the cost of any fire, environmental, extended coverage or any other insurance policy covering the Building or the Project, and shall comply with all rules, orders, regulations and requirements of the insurers of the Building and the Project, and Tenant shall promptly, upon demand, reimburse Landlord for any additional premium charged for such policy by reason of Tenant's failure to comply with the provisions of this Article.

12.4. Tenant shall keep all doors opening onto public corridors closed, except when in use for ingress and egress.

12.5. No additional locks or bolts of any kind shall be placed upon any of the doors or windows by Tenant, nor shall any changes be made to existing locks or the mechanisms thereof without Landlord's prior written consent. Tenant shall, upon termination of this Lease, return to Landlord all keys to offices and restrooms either furnished to or otherwise procured by Tenant. In the event any key so furnished to Tenant is lost, Tenant shall pay to Landlord the cost of replacing the same or of changing the lock or locks opened by such lost key if Landlord shall

deem it necessary to make such change. Tenant shall be permitted to install its own security system in the Premises which is compatible with the key card access system for the Building and may include, within the Premises, video, motion and other sensors, provided, however no portion of it shall be visible outside the Premises without Landlord's approval. Tenant shall have the right to install and use a WiFi system in its Premises provided the same does not interfere with other tenants in the Project.

12.6. No awnings or other projections shall be attached to any outside wall of the Building. No curtains, blinds, shades or screens shall be attached to or hung in, or used in connection with, any window or door of the Premises other than Landlord's standard window coverings. Neither the interior nor exterior of any windows shall be coated or otherwise sunscreened without Landlord's prior written consent, nor shall any bottles, parcels or other articles be placed on the windowsills or items attached to windows that are visible from outside the Premises. No equipment, furniture or other items of personal property shall be placed on any exterior balcony without Landlord's prior written consent.

12.7. No sign, advertisement or notice ("Signage") shall be exhibited, painted or affixed by Tenant on any part of the Premises or the Building without Landlord's prior written consent Signage shall conform to Landlord's design criteria. For any Signage, Tenant shall, at Tenant's own cost and expense, (a) acquire all permits for such Signage in compliance with Applicable Laws and (b) design, fabricate, install and maintain such Signage in a first-class condition. Tenant shall be responsible for reimbursing Landlord for costs incurred by Landlord in removing any of Tenant's Signage upon the expiration or earlier termination of the Lease. Interior signs on entry doors to the Premises shall be inscribed, painted or affixed by Tenant at Tenant's sole cost and expense, and shall be of a size, color and type and be located in a place acceptable to Landlord. An interior sign on the directory tablet shall be inscribed, painted or affixed for Tenant by Landlord at Landlord's sole cost and expense; provided, however, that Tenant shall be responsible for all costs and expenses incurred by Landlord for any changes to Tenant's listing in such directory tablet requested by Tenant from and after the Term Commencement Date (excluding any changes on account of improvements to the directory tablet initiated by Landlord). The directory tablet shall be provided exclusively for the display of the name and location of tenants only. Tenant shall not place anything on the exterior of the corridor walls or corridor doors other than Landlord's standard lettering. At Landlord's option, Landlord may install any Tenant Signage, and Tenant shall pay all costs associated with such installation within thirty (30) days after demand therefor.

12.8. Tenant may only place equipment within the Premises with floor loading consistent with the Building's structural design unless Tenant obtains Landlord's prior written approval. Tenant may place such equipment only in a location designed to carry the weight of such equipment.

12.9. Tenant shall cause any equipment or machinery to be installed in the Premises so as to reasonably prevent sounds or vibrations therefrom from extending into the Common Area or other offices in the Project.

12.10. Tenant shall not (a) do or permit anything to be done in or about the Premises that shall in any way obstruct or interfere with the rights of other tenants or occupants of the Project, or injure or annoy them, (b) use or allow the Premises to be used for immoral, unlawful or objectionable purposes, (c) cause, maintain or permit any nuisance or waste in, on or about the Project or (d) take any other action that would in Landlord's reasonable determination in any manner adversely affect other tenants' quiet use and enjoyment of their space or adversely impact their ability to conduct business in a professional and suitable work environment. Notwithstanding anything in this Lease to the contrary, Tenant may not install any security systems (including cameras) outside the Premises or that record sounds or images outside the Premises without Landlord's prior written consent, which Landlord may withhold in its sole and absolute discretion.

12.11. Notwithstanding any other provision herein to the contrary, Tenant shall be responsible for all liabilities, costs and expenses arising out of or in connection with the compliance of the Premises with the Americans with Disabilities Act, 42 U.S.C. § 12101, et seq., and any state and local accessibility laws, codes, ordinances and rules (collectively, and together with regulations promulgated pursuant thereto, the "ADA") (except to the extent that any such non-compliance of the Premises with the ADA (as in effect and interpreted as of the Term Commencement Date) existed as of the Term Commencement Date, and Tenant shall indemnify, compensate, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold the Landlord Indemnitees harmless from and against Claims arising out of any such failure of the Premises to comply with the Tenant's obligations with respect to the ADA under this Section. This Section (as well as any other provisions of this Lease dealing with indemnification of the Landlord Indemnitees by Tenant) shall be deemed to be modified in each case by the insertion in the appropriate place of the following: "except as otherwise provided in Mass. G.L. Ter. Ed., C. 186, Section 15." The provisions of this Section shall survive the expiration or earlier termination of this Lease.

12.12. Tenant shall maintain temperature and humidity in the Premises in accordance with ASHRAE standards at all times (subject to Landlord's compliance with its obligations with respect to base Building HVAC systems under this Lease).

12.13. Tenant shall establish and maintain a chemical safety program administered by a licensed, qualified individual in accordance with the requirements of the Massachusetts Water Resources Authority ("MWRA") and any other applicable Governmental Authority. Tenant shall be solely responsible for all costs incurred in connection with such chemical safety program, and Tenant shall provide Landlord with such documentation as Landlord may reasonably require evidencing Tenant's compliance with the requirements of (a) the MWRA and any other applicable Governmental Authority with respect to such chemical safety program and (b) this Section. Notwithstanding the foregoing, Landlord shall obtain, at Landlord's cost, and Landlord shall maintain during the Term, (m) any permit required by the MWRA ("MWRA Permit") and (n) a wastewater treatment operator license from the Commonwealth of Massachusetts with respect to Tenant's use of the Acid Neutralization Tank (as defined below) in the Building. Tenant shall not introduce anything into the Acid Neutralization Tank (x) in violation of the terms of the MWRA Permit, (y) in violation of Applicable Laws or (z) that would interfere with the proper functioning of the Acid Neutralization Tank. Tenant shall reimburse Landlord within ten (10) business days after demand for any costs incurred by Landlord pursuant to the immediately foregoing sentence. Tenant agrees to reasonably cooperate with Landlord in order to obtain the MWRA Permit and the wastewater treatment operator license.

13. Rules and Regulations, CC&Rs, Parking Facilities and Common Area.

13.1. Tenant shall have the non-exclusive right, in common with others, to use the Common Area in conjunction with Tenant's use of the Premises for the Permitted Use, and such use of the Common Area and Tenant's use of the Premises shall be subject to the rules and regulations adopted by Landlord and attached hereto as Exhibit F, together with such other reasonable and nondiscriminatory rules and regulations as are hereafter promulgated by Landlord in its sole and absolute discretion (the "Rules and Regulations"). Tenant shall and shall ensure that its contractors, subcontractors, employees, subtenants and invitees faithfully observe and comply with the Rules and Regulations. Landlord shall not be responsible to Tenant for the violation or non-performance by any other tenant or any agent, employee or invitee thereof of any of the Rules and Regulations.

13.2. This Lease is subject to any recorded covenants, conditions or restrictions on the Project or Property, including the Parking and Transportation Demand Management Plan for the Project that was approved on July 2, 1999, and amended December 14, 2001, and that is attached hereto as Exhibit G with all applicable transfers thereof (the "PTDM"), as the same may be amended, amended and restated, supplemented or otherwise modified from time to time (the "CC&Rs"). Tenant shall, at its sole cost and expense, comply with the CC&Rs. Tenant acknowledges that Tenant, at its sole cost and expense, shall comply with the tenant requirements in the PTDM, including the requirements set forth in the "Alternative Work Programs," "Public Transportation Incentives," "Ridesharing Programs" and "Provisions of Bicycle and Pedestrian Amenities" sections thereof. Tenant, at its sole cost and expense, shall also comply with the reporting requirements set forth in the PTDM at Landlord's request. Any costs incurred by Landlord in connection with the PTDM shall constitute an Operating Expense.

13.3. Tenant agrees to cooperate with Landlord in connection with "Developer's" performance of the obligations of the "Developer" under the Development Controls and Community Outreach Program for Cambridge Place effective as of July 27, 1998, executed by The Bulfinch Companies, Inc., CCC I Realty Trust, 205 Broadway Realty Trust, Neighbors for a Better Community, Inc., and the McKinnon Company, Inc. (as it may be amended, modified, amended and restated, otherwise supplemented, or superseded from time to time, the "Community Agreement"). Landlord encourages Tenant to participate in programs of civic and charitable giving and the provision of in-kind services and facilities that will extend the benefits of the Project to neighborhood residents, including, by way of example, the charitable and civic connections identified in Section 2.5 of the Community Agreement.

13.4. The Charles River Transportation Management Association (of which Landlord or an affiliate of Landlord is currently a member) provides certain programs to help improve transportation in the Cambridge area. Their website is www.charlesrivertma.org.

13.5. Tenant shall have a non-exclusive, irrevocable license to use 32 parking spaces ("Tenant's Parking Spaces") in the parking facilities serving the Hampshire Project in common on an unreserved basis with other tenants of the Hampshire Project during the Term at a cost of Two Hundred Eighty Five Dollars ($285) per parking space per month (subject to market rate

adjustments by Landlord from time to time throughout the Term), which Tenant shall pay simultaneously with payments of Rent as Additional Rent commencing on the Term Commencement Date. Notwithstanding the foregoing, during the period from the Term Commencement Date to the first (1st) anniversary of the Term Commencement Date, Tenant shall only pay for, and shall only have the right to use, 24 of Tenant's Parking Spaces; provided, however, that Tenant shall have the one-time right, which may be exercised by Tenant at any time during the period from the Term Commencement Date to the first (1st) anniversary of the Term Commencement Date, to notify Landlord in writing that it elects to use (and shall be required to pay for) the remaining 8 of Tenant's Parking Spaces (the "Remaining Spaces"). If Tenant does not elect to use the Remaining Spaces prior to the first (1st) anniversary of the Term Commencement Date, or Tenant surrenders all or any portion of Tenant's Parking Spaces through written notice to Landlord after the first (1st) anniversary of the Term Commencement Date, (a) Tenant shall be relieved of its obligation to pay for the surrendered spaces beginning on the first day of the month that is more than thirty (30) days from the delivery of said notice and (b) Tenant's ability to license the Remaining Spaces or any surrendered spaces in the future shall be subject to their availability, which availability will not be guaranteed by Landlord from and after any such surrender.

13.6. Tenant agrees not to unreasonably overburden the parking facilities and agrees to cooperate with Landlord and other tenants in the use of the parking facilities. Landlord reserves the right to determine that parking facilities are becoming overcrowded and to limit Tenant's use thereof. Upon such determination, Landlord may reasonably allocate parking spaces among Tenant and other tenants of the Building or the Project. Nothing in this Section, however, is intended to create an affirmative duty on Landlord's part to monitor parking.

13.7. Subject to the terms of this Lease including the Rules and Regulations and the rights of other tenants of the Building, Tenant shall have the non-exclusive right on an unreserved basis to access the freight loading dock and freight elevator twenty-four (24) hours per day, seven (7) days per week, at no additional cost.

14. Project Control by Landlord.

14.1. Landlord reserves full control over the Building and the Project to the extent not inconsistent with Tenant's enjoyment of the Premises as provided by this Lease. This reservation includes Landlord's right to subdivide the Project or the Hampshire Project; convert the Building and other buildings within the Hampshire Project to condominium units; change the size of the Project by selling all or a portion of the Project or adding real property and any improvements thereon to the Project; grant easements and licenses to third parties; maintain or establish ownership of the Building separate from fee title to the Property; make additions to or reconstruct portions of the Building and the Project; install, use, maintain, repair, replace and relocate for service to the Premises and other parts of the Building or the Project pipes, ducts, conduits, wires and appurtenant fixtures, wherever located in the Premises, the Building or elsewhere at the Project; and alter or relocate any other Common Area or facility, including private drives, lobbies, entrances and landscaping; provided, however, that such rights shall be exercised in a way that does not materially adversely affect Tenant's beneficial use and occupancy of the Premises, including the Permitted Use and Tenant's access to the Premises. Tenant acknowledges that Landlord specifically reserves the right to allow the exclusive use of corridors and restroom facilities located on specific floors to one or more tenants occupying such floors; provided, however, that Tenant shall not be deprived of the use of the corridors reasonably required to serve the Premises or of restroom facilities serving the floor upon which the Premises are located.

14.2. Possession of areas of the Premises necessary for utilities, services, safety and operation of the Building is reserved to Landlord.

14.3. Tenant shall, at Landlord's request, promptly execute such further documents as may be reasonably appropriate to assist Landlord in the performance of its obligations hereunder; provided that Tenant need not execute any document that creates additional liability for Tenant or that deprives Tenant of the quiet enjoyment and use of the Premises as provided for in this Lease.

14.4. Landlord may, at any and all reasonable times during non-business hours (or during business hours, if (a) with respect to Subsections 14.4(u) through 14.4(y), Tenant so requests, and (b) with respect to Subsection 14.4(z), if Landlord so requests), and upon twenty-four (24) hours' prior notice (which may be oral or by email to the office manager or other Tenant-designated individual at the Premises; but provided that no time restrictions shall apply or advance notice be required if an emergency necessitates immediate entry), enter the Premises to (u) inspect the same and to determine whether Tenant is in compliance with its obligations hereunder, (v) supply any service Landlord is required to provide hereunder, (w) alter, improve or repair any portion of the Building other than the Premises for which access to the Premises is reasonably necessary, (x) post notices of nonresponsibility, (y) access the telephone equipment, electrical substation and fire risers and (z) show the Premises to prospective tenants during the final year of the Term and current and prospective purchasers and lenders at any time. Notwithstanding the foregoing, Tenant shall have the right to have a representative of Tenant accompany Landlord at such times. With respect to that portion of the Lab Zone of the Premises that is a Biosafety Level 2 Enhanced laboratory (the "Secure Area"), which Tenant shall clearly identify with appropriate signage in the Premises, Tenant's representative shall be present during any time that Landlord accesses the Secure Area (except in the event of an emergency during which time Landlord may access the Secure Area without Tenant's representative being present) and Landlord shall endeavor to comply with Tenant's reasonable security and safety requirements that are provided to Landlord in writing in advance. In connection with any such alteration, improvement or repair as described in Subsection 14.4(w), Landlord may erect in the Premises or elsewhere in the Project scaffolding and other structures reasonably required for the alteration, improvement or repair work to be performed. In no event shall Tenant's Rent abate as a result of Landlord's activities pursuant to this Section; provided, however, that all such activities shall be conducted in such a manner so as to cause as little interference to Tenant as is reasonably possible. Landlord shall at all times retain a key with which to unlock all of the doors in the Premises. If an emergency necessitates immediate access to the Premises, Landlord may use whatever force is necessary to enter the Premises, and any such entry to the Premises shall not constitute a forcible or unlawful entry to the Premises, a detainer of the Premises, or an eviction of Tenant from the Premises or any portion thereof.

15. Quiet Enjoyment. Landlord covenants that Tenant, upon paying the Rent and performing its obligations contained in this Lease, may peacefully and quietly have, hold and enjoy the Premises, free from any claim by Landlord or persons claiming under Landlord, but subject to all of the terms and provisions hereof, provisions of Applicable Laws and rights of record to which this Lease is or may become subordinate. This covenant is in lieu of any other quiet enjoyment covenant, either express or implied.

16. Utilities and Services.

16.1. Tenant shall pay for all water (including the cost to service, repair and replace reverse osmosis, de-ionized and other treated water), gas, heat, light, power, telephone, internet service, cable television, other telecommunications and other utilities supplied to the Premises, together with any fees, surcharges and taxes thereon. Utilities for the HVAC system that supports the Lab Zone shall be billed to Tenant on a proportionate basis. If any utility is not separately metered or submetered to Tenant, Tenant shall pay Tenant's Adjusted Share of Operating Expenses or Laboratory Support Expenses, as the case may be, of all charges of such utility jointly metered with other premises as Additional Rent or, in the alternative, Landlord may, at its option, monitor the usage of such utilities by Tenant and charge Tenant with the cost of purchasing, installing and monitoring such metering equipment, which cost shall be paid by Tenant as Additional Rent. Landlord may base its bills for utilities on reasonable estimates; provided that Landlord adjusts such billings to reflect the actual cost of providing utilities to the Premises no less than quarterly. To the extent that Tenant uses more than Tenant's Pro Rata Share of Laboratory Building of any utilities attributable to Base Building Laboratory Support Systems or otherwise, then Tenant shall pay Landlord for Tenant's Adjusted Share of such utilities to reflect such excess. In the event that the Building or Project is less than fully occupied during a calendar year, Tenant acknowledges that Landlord may extrapolate utility usage that varies depending on the occupancy of the Building or Project (as applicable) to equal Landlord's reasonable estimate of what such utility usage would have been had the Building or Project, as applicable, been ninety-five percent (95%) occupied during such calendar year; provided, however, that Landlord shall not recover more than one hundred percent (100%) of the cost of such utilities. In the event that the Laboratory Building is less than fully occupied during any portion of the Term, Tenant acknowledges that during such time, Landlord shall charge Tenant for the Laboratory Support Expenses (other than those utilities that are metered and submetered) based on Tenant's pro rata share of the occupied Laboratory Building ("Occupied Lab Share"), rather than Tenant's Pro Rata Share of Laboratory Building, as determined by Landlord based on the ratio of the Rentable Area of the Premises to the total Rentable Area of the Laboratory Building for which there are leases (including without limitation, this Lease) with terms that have commenced, expressed as a percentage of the Laboratory Support Expenses. Landlord shall have the right to recalculate the Occupied Lab Share from time to time as occupancy of the Laboratory Building changes. Except as expressly provided herein or approved by Landlord, Tenant shall only be entitled to use Tenant's Pro Rata Share of Laboratory Building of Base Building Laboratory Support Systems, regardless of whether Tenant is paying its Occupied Lab Share or Pro Rata Share of Laboratory Building of the costs thereof. Tenant shall not be liable for the cost of utilities supplied to the Premises attributable to the time period prior to the Term Commencement Date; provided, however, that, if Landlord shall permit Tenant possession of the Premises prior to the Term Commencement Date and Tenant uses the Premises for any purpose other than placement of personal property as set forth in Section 4.3, then Tenant shall be responsible for the cost of utilities supplied to the Premises from such earlier date of possession.

16.2. Landlord shall not be liable for, nor shall any eviction of Tenant result from, the failure to furnish any utility or service, whether or not such failure is caused by accidents; breakage; casualties (to the extent not caused by the party claiming Force Majeure); Severe Weather Conditions (as defined below); physical natural disasters (but excluding weather conditions that are not Severe Weather Conditions); strikes, lockouts or other labor disturbances or labor disputes (other than labor disturbances and labor disputes resulting solely from the acts or omissions of the party claiming Force Majeure); acts of terrorism; riots or civil disturbances; wars or insurrections; shortages of materials (which shortages are not unique to the party claiming Force Majeure); government regulations, moratoria or other governmental actions, inactions or delays; failures by third parties to deliver gas, oil or another suitable fuel supply, or inability of the party claiming Force Majeure, by exercise of reasonable diligence, to obtain gas, oil or another suitable fuel; or other causes beyond the reasonable control of the party claiming that Force Majeure has occurred (collectively, "Force Majeure"); or, to the extent permitted by Applicable Laws, Landlord's negligence. In the event of such failure, Tenant shall not be entitled to termination of this Lease or any abatement or reduction of Rent, nor shall Tenant be relieved from the operation of any covenant or agreement of this Lease. "Severe Weather Conditions" means weather conditions that are materially worse than those that reasonably would be anticipated for the Property at the applicable time based on historic meteorological records. Notwithstanding anything to the contrary in this Lease, if, for more than five (5) consecutive business days following written notice to Landlord and as a direct result of Landlord's gross negligence or willful misconduct (and except to the extent that such failure is caused by any other factor, including any action or inaction of a Tenant Party (as defined below)), the provision of HVAC or other utilities to all or a material portion of the Premises that Landlord must provide pursuant to this Lease is interrupted (a "Material Services Failure"), then Tenant's Base Rent and Operating Expenses (or, to the extent that less than all of the Premises are affected, a proportionate amount (based on the Rentable Area of the Premises that is rendered unusable) of Base Rent and Operating Expenses) shall thereafter be abated until the Premises are again usable by Tenant for the Permitted Use; provided, however, that, if Landlord is diligently pursuing the restoration of such HVAC and other utilities and Landlord provides substitute HVAC and other utilities reasonably suitable for Tenant's continued use and occupancy of the Premises for the Permitted Use (e.g., supplying potable water or portable air conditioning equipment), then neither Base Rent nor Operating Expenses shall be abated. During any Material Services Failure, Tenant will cooperate with Landlord to arrange for the provision of any interrupted utility services on an interim basis via temporary measures until final corrective measures can be accomplished, and Tenant will permit Landlord the necessary access to the Premises to remedy such Material Service Failure. In the event of any interruption of HVAC or other utilities that Landlord must provide pursuant to this Lease, regardless of the cause, Landlord shall diligently pursue the restoration of such HVAC and other utilities. Notwithstanding anything in this Lease to the contrary, but subject to Article 24 (which shall govern in the event of a casualty), the provisions of this Section shall be Tenant's sole recourse and remedy in the event of an interruption of HVAC or other utilities to the Premises, including related to Section 16.8.

16.3. Tenant shall pay for, prior to delinquency of payment therefor, any utilities and services that may be furnished to the Premises during or, if Tenant occupies the Premises after the expiration or earlier termination of the Term, after the Term, beyond those utilities provided by Landlord, including telephone, internet service, cable television and other telecommunications, together with any fees, surcharges and taxes thereon. Upon Landlord's demand, utilities and services provided to the Premises that are separately metered shall be paid by Tenant directly to the supplier of such utilities or services.

16.4. Tenant shall not, without Landlord's prior written consent, use any device in the Premises (including data processing machines) that will in any way (a) increase the amount of ventilation, air exchange, gas, steam, electricity or water required or consumed in the Premises based upon Tenant's Pro Rata Share of the Building or the Laboratory Building (as applicable) beyond the existing capacity of the Building or the Base Building Laboratory Support Systems usually furnished or supplied for the Permitted Use or (b) exceed Tenant's Pro Rata Share of the Building's or Tenant's Pro Rata Share of the Laboratory Building's (as applicable) capacity to provide such utilities or services.

16.5. If Tenant shall require utilities or services in excess of those usually furnished or supplied for tenants in similar spaces in the Building or the Project by reason of Tenant's equipment or extended hours of business operations, then Tenant shall first procure Landlord's consent for the use thereof, which consent Landlord may condition upon the availability of such excess utilities or services, and Tenant shall pay as Additional Rent an amount equal to the cost of providing such excess utilities and services.

16.6. Landlord shall provide water in the Common Area for lavatory and landscaping purposes only, which water shall be from the local municipal or similar source; provided, however, that if Landlord determines that Tenant requires, uses or consumes water provided to the Common Area for any purpose other than ordinary lavatory purposes, Landlord may install a water meter ("Tenant Water Meter") and thereby measure Tenant's water consumption for all purposes. Tenant shall pay Landlord for the costs of any Tenant Water Meter and the installation and maintenance thereof during the Term. If Landlord installs a Tenant Water Meter, Tenant shall pay for water consumed, as shown on such meter, as and when bills are rendered. If Tenant fails to timely make such payments, Landlord may pay such charges and collect the same from Tenant. Any such costs or expenses incurred or payments made by Landlord for any of the reasons or purposes stated in this Section shall be deemed to be Additional Rent payable by Tenant and collectible by Landlord as such.

16.7. Landlord reserves the right to stop service of the elevator, plumbing, ventilation, air conditioning and utility systems, when Landlord deems necessary or desirable, due to accident, emergency or the need to make repairs, alterations or improvements, until such repairs, alterations or improvements shall have been completed, and Landlord shall further have no responsibility or liability for failure to supply elevator facilities, plumbing, ventilation, air conditioning or utility service when prevented from doing so by Force Majeure or, to the extent permitted by Applicable Laws, Landlord's negligence. Without limiting the foregoing, it is expressly understood and agreed that any covenants on Landlord's part to furnish any service pursuant to any of the terms, covenants, conditions, provisions or agreements of this Lease, or to perform any act or thing for the benefit of Tenant, shall not be deemed breached if Landlord is unable to furnish or perform the same by virtue of Force Majeure or, to the extent permitted by Applicable Laws, Landlord's negligence.

16.8. Landlord will install a back-up generator at the Project and connect the Generator to the Premises' emergency electrical panel (the "Generator"). Tenant shall be entitled to use up to its Pro Rata Share of Laboratory Building of power from the Generator (after deducting any power from the Generator required for the Common Area) on a non-exclusive basis with other tenants in the Building. Tenant shall reimburse Landlord for Tenant's Pro Rata Share of Laboratory Building (or Tenant's Occupied Lab Share, if applicable) of all costs, charges and expenses incurred by Landlord from time to time in connection with or arising out of the operation, use, maintenance, repair or refurbishment of the Generator (collectively, "Generator Costs"). Landlord expressly disclaims any warranties with regard to the Generator or the installation thereof, including any warranty of merchantability or fitness for a particular purpose. Landlord shall maintain the Generator and any equipment connecting the Generator to Tenant's automatic transfer switch in good working condition as set forth above; provided, however, that Tenant shall be solely responsible (and Landlord shall not be liable) for maintaining and operating Tenant's automatic transfer switch and the distribution of power from Tenant's automatic transfer switch throughout the Premises; and provided, further, that Landlord shall not be liable for any failure to make any repairs or to perform any maintenance that is an obligation of Landlord unless such failure shall persist for an unreasonable time after Tenant provides Landlord with written notice of the need for such repairs or maintenance. The provisions of Section 16.2 of this Lease shall apply to the Generator.

16.9. Subject to Section 18.1, Landlord shall furnish HVAC to the Lab Zone as reasonably required (except as this Lease otherwise provides or as to any special requirements that arise from Tenant's particular use of the Premises) for reasonably comfortable occupancy of the Lab Zone twenty-four (24) hours a day, every day during the Term, subject to casualty, eminent domain or as otherwise specified in this Article. Subject to Section 18.1, Landlord shall furnish HVAC to the Office Zone for reasonably comfortable occupancy of the Office Zone twenty-four (24) hours a day, every day during the Term, subject to casualty, eminent domain or as otherwise specified in this Article; provided that Tenant complies with the next sentence. If Tenant will require HVAC to the Office Zone outside normal business hours of business days (as reasonably designated by Landlord, and which shall initially be 8 a.m. to 6 p.m., Mondays through Fridays) in the Office Zone ("Overtime HVAC"), then Landlord shall be obligated to provide Overtime HVAC only if Tenant requests it by 4 p.m. on the immediately preceding business day, and Tenant must pay for a minimum of 3 hours. Tenant shall pay Landlord, as Additional Rent, $100 per hour for Overtime HVAC for the Premises (which charge may be adjusted by Landlord from time to time), as well as for HVAC provided during Tenant's business hours. To the extent that Tenant requires HVAC services in excess of those provided by connection to the Building HVAC systems (that serve either the Lab Zone or Office Zone or both), Tenant shall install and maintain, at its sole cost (and Landlord shall not be liable for) supplemental HVAC systems in accordance with the provisions of this Lease. Notwithstanding anything to the contrary in this Section, Landlord shall have no liability, and Tenant shall have no right or remedy, on account of any interruption or impairment in HVAC services; provided that Landlord diligently endeavors to cure any such interruption or impairment.

16.10. For any utilities serving the Premises for which Tenant is billed directly by such utility provider, Tenant agrees to furnish to Landlord (a) any invoices or statements for such utilities within thirty (30) days after Tenant's receipt thereof, (b) within thirty (30) days after Landlord's request, any other utility usage information reasonably requested by Landlord which

is in Tenant's possession, and (c) within thirty (30) days after each calendar year during the Term, authorization to allow Landlord to access Tenant's usage information necessary for Landlord to complete an ENERGY STAR® Statement of Performance (or similar comprehensive utility usage report (e.g., related to Labs 21), if requested by Landlord) and any other information reasonably requested by Landlord for the immediately preceding year; and Tenant shall comply with any other energy usage or consumption requirements required by Applicable Laws. Tenant shall retain records of utility usage at the Premises, including invoices and statements from the utility provider, for at least sixty (60) months, or such other period of time as may be requested by Landlord. Tenant acknowledges that any utility information for the Premises, the Building and the Project may be shared with third parties, including Landlord's consultants and Governmental Authorities. In the event that Tenant fails to comply with this Section, Tenant hereby authorizes Landlord to collect utility usage information directly from the applicable utility providers, and Tenant shall pay Landlord a fee of [redacted] to collect such utility usage information. In addition to the foregoing, Tenant shall comply with all Applicable Laws related to the disclosure and tracking of energy consumption at the Premises. The provisions of this Section shall survive the expiration or earlier termination of this Lease.

16.11. As part of Landlord's Work, the Building will be serviced by a common laboratory waste sanitary sewer connection from the pH neutralization room in garage level P3 to the municipal sewer line in the street adjacent to the Building. Landlord will install, as part of Landlord's Work, a separate acid neutralization tank (the "Acid Neutralization Tank") that will be connected to the Premises, as well as to other premises in the Laboratory Building. Tenant shall have a non-exclusive right to use its Pro Rata Share of Laboratory Building of the Acid Neutralization Tank in accordance with Applicable Laws in common with other tenants of the Laboratory Building. Tenant shall reimburse Landlord for Tenant's Pro Rata Share of Laboratory Building (or Tenant's Occupied Lab Share, if applicable) of all costs, charges and expenses incurred by Landlord from time to time in connection with or arising out of the operation, use, maintenance, repair or refurbishment of the Acid Neutralization Tank, including all clean-up costs relating to the Acid Neutralization Tank (collectively, "Tank Costs"). Notwithstanding the foregoing, in the event the Acid Neutralization Tank is damaged or repairs to the Acid Neutralization Tank are required as a result of the improper use of the Acid Neutralization Tank by Tenant, Tenant shall be responsible for one hundred percent (100%) of the cost of any repairs or replacement required as a result of such improper use by Tenant, regardless of whether the Acid Neutralization Tank is then being used by other tenant(s) or occupant(s) of the Building. Similarly, if the Acid Neutralization Tank is damaged, or if repairs to the Acid Neutralization Tank are required as a result of the improper use of the Acid Neutralization Tank by other tenant(s) or occupant(s) of the Building, then Tenant shall have no responsibility for the cost of any repairs or replacements required as a result of such improper use by such other tenant(s) or occupant(s). Tenant shall indemnify, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold the Landlord Indemnitees harmless from and against any and all Claims, including (a) diminution in value of the Project or any portion thereof, (b) damages for the loss or restriction on use of rentable or usable space or of any amenity of the Project, (c) damages arising from any adverse impact on marketing of space in the Project or any portion thereof and (d) sums paid in settlement of Claims that arise during or after the Term as a result of Tenant's improper use of the Acid Neutralization Tank. This indemnification by Tenant includes costs incurred in connection with any investigation of site conditions or any clean-up, remediation, removal or restoration required by any Governmental Authority caused by Tenant's improper use of the Acid Neutralization Tank.

17. Alterations.

17.1. Tenant shall make no alterations, additions or improvements in or to the Premises or engage in any construction, demolition, reconstruction, renovation or other work (whether major or minor) of any kind in, at or serving the Premises ("Alterations") without Landlord's prior written approval, which approval Landlord shall not unreasonably withhold; provided, however, that, in the event any proposed Alteration affects (a) any structural portions of the Building, including exterior walls, the roof, the foundation or slab, foundation or slab systems (including barriers and subslab systems) or the core of the Building, (b) the exterior of the Building or (c) any Building systems, including elevator, plumbing, HVAC, electrical, security, life safety, power, and the Base Building Laboratory Support Systems, then Landlord may withhold its approval in its sole and absolute discretion. Tenant shall, in making any Alterations, use only those architects, contractors, suppliers and mechanics of which Landlord has given prior written approval, which approval shall be in Landlord's sole and absolute discretion. In seeking Landlord's approval, Tenant shall provide Landlord, at least thirty (30) days in advance of any proposed construction, with plans, specifications, bid proposals, certified stamped engineering drawings and calculations by Tenant's engineer of record or architect of record (including connections to the Building's structural system, modifications to the Building's envelope, non-structural penetrations in slabs or walls, and modifications or tie-ins to life safety systems), work contracts, requests for laydown areas and such other information concerning the nature and cost of the Alterations as Landlord may reasonably request. In no event shall Tenant use or Landlord be required to approve any architects, consultants, contractors, subcontractors or material suppliers that Landlord reasonably believes could cause labor disharmony or may not have sufficient experience, in Landlord's reasonable opinion, to perform work in an occupied Class "A" laboratory research building and in tenant-occupied lab areas. Notwithstanding the foregoing, Tenant may make strictly cosmetic changes to the Premises that do not require any permits or more than three (3) total contractors and subcontractors ("Cosmetic Alterations") without Landlord's consent; provided that (y) the cost of any Cosmetic Alterations does not exceed Fifty Thousand Dollars ($50,000) in any one instance or One Hundred Fifty Thousand Dollars ($150,000) annually, (z) such Cosmetic Alterations do not (i) require any structural or other substantial modifications to the Premises, (ii) require any changes to or adversely affect the Building systems, (iii) affect the exterior of the Building or (iv) trigger any requirement under Applicable Laws that would require Landlord to make any alteration or improvement to the Premises, the Building or the Project. Tenant shall give Landlord at least ten (10) days' prior written notice of any Cosmetic Alterations.

17.2. Tenant shall not construct or permit to be constructed partitions or other obstructions that might interfere with free access to mechanical installation or service facilities of the Building or with other tenants' components located within the Building, or interfere with the moving of Landlord's equipment to or from the enclosures containing such installations or facilities.

17.3. Tenant shall accomplish any work performed on the Premises or the Building in such a manner as to permit any life safety systems to remain fully operable at all times.

17.4. Any work performed on the Premises, the Building or the Project by Tenant or Tenant's contractors shall be done at such times and in such manner as Landlord may from time to time designate. Tenant covenants and agrees that all work done by Tenant or Tenant's contractors shall be performed in full compliance with Applicable Laws. Within thirty (30) days after completion of any Alterations, Tenant shall provide Landlord with complete "as built" drawing print sets and electronic CADD files on disc (or files in such other current format in common use as Landlord reasonably approves or requires) showing any changes in the Premises, as well as a commissioning report prepared by a licensed, qualified commissioning agent hired by Tenant and approved by Landlord for all new or affected mechanical, electrical and plumbing systems. Any such "as built" plans shall show the applicable Alterations as an overlay on the Building as-built plans; provided that Landlord provides the Building "as built" plans to Tenant.

17.5. Before commencing any Alterations, Tenant shall (a) give Landlord at least thirty (30) days' prior written notice of the proposed commencement of such work and the names and addresses of the persons supply labor or materials therefor so that Landlord may enter the Premises to post and keep posted thereon and therein notices or to take any further action that Landlord may reasonably deem proper for the protection of Landlord's interest in the Project and (b) shall, if required by Landlord, secure, at Tenant's own cost and expense, a completion and lien indemnity bond satisfactory to Landlord for such work.

17.6. Tenant shall repair any damage to the Premises caused by Tenant's removal of any property from the Premises. During any such restoration period, Tenant shall pay Rent to Landlord as provided herein as if such space were otherwise occupied by Tenant. The provisions of this Section shall survive the expiration or earlier termination of this Lease.

17.7. The Premises plus any Alterations; Signage; Tenant Improvements; attached equipment, decorations, fixtures and trade fixtures; movable laboratory casework and related appliances; and other additions and improvements attached to or built into the Premises made by either of the parties (including all floor and wall coverings; paneling; sinks and related plumbing fixtures; laboratory benches; exterior venting fume hoods; walk-in freezers and refrigerators; ductwork; conduits; electrical panels and circuits; attached machinery and equipment; and built-in furniture and cabinets, in each case, together with all additions and accessories thereto), shall (unless, prior to such construction or installation, Landlord elects otherwise in writing) at all times remain the property of Landlord, shall remain in the Premises and shall (unless, prior to construction or installation thereof, Landlord elects otherwise in writing) be surrendered to Landlord upon the expiration or earlier termination of this Lease. For the avoidance of doubt, the items listed on Exhibit H attached hereto (which Exhibit H may be updated by Tenant from and after the Term Commencement Date, subject to Landlord's written consent) constitute Tenant's property and shall be removed by Tenant upon the expiration or earlier termination of the Lease.

17.8. Notwithstanding any other provision of this Article to the contrary, in no event shall Tenant remove any improvement from the Premises as to which Landlord contributed payment, including the Tenant Improvements, without Landlord's prior written consent, which consent Landlord may withhold in its sole and absolute discretion.

17.9. If Tenant shall fail to remove any of its property from the Premises prior to the expiration or earlier termination of this Lease, then Landlord may, at its option, remove the same in any manner that Landlord shall choose and store such effects without liability to Tenant for loss thereof or damage thereto, and Tenant shall pay Landlord, upon demand, any costs and expenses incurred due to such removal and storage or Landlord may, at its sole option and without notice to Tenant, sell such property or any portion thereof at private sale and without legal process for such price as Landlord may obtain and apply the proceeds of such sale against any (a) amounts due by Tenant to Landlord under this Lease and (b) any expenses incident to the removal, storage and sale of such personal property.

17.10. Tenant shall pay to Landlord an amount equal to three percent (3%) of the cost to Tenant of all Alterations (to cover Landlord's overhead and expenses for plan review, engineering review, coordination, scheduling and supervision thereof, except (A) Tenant shall not be required to pay such amount for Cosmetic Alterations and (B) with respect to Tenant's initial sublease of a portion of the Premises (which such sublease is subject to the terms and conditions of Article 29 of this Lease), Tenant shall only be required to pay for Landlord's third-party out-of- pocket costs for its review, coordination, scheduling and supervision of the demolition of the demising walls of the subleased premises, if and when such demolition occurs as part of future Alterations by Tenant. For purposes of payment of such sum, Tenant shall submit to Landlord copies of all bills, invoices and statements covering the costs of such charges, accompanied by payment to Landlord of the fee set forth in this Section. Tenant shall reimburse Landlord for any extra expenses incurred by Landlord by reason of faulty work done by Tenant or its contractors, or by reason of delays caused by such work, or by reason of inadequate clean-up.

17.11. Within sixty (60) days after final completion of any Alterations performed by Tenant with respect to the Premises, Tenant shall submit to Landlord documentation showing the amounts expended by Tenant with respect to such Alterations, together with supporting documentation reasonably acceptable to Landlord.

17.12. Tenant shall take, and shall cause its contractors to take, commercially reasonable steps to protect the Premises during the performance of any Alterations, including covering or temporarily removing any window coverings so as to guard against dust, debris or damage.

17.13. Tenant shall require its contractors and subcontractors performing work on the Premises to name Landlord and its affiliates and Lenders as additional insureds on their respective insurance policies.

18. Repairs and Maintenance.

18.1. Subject to the limitations set forth in Section 16.9, Landlord shall repair and maintain the structural and exterior portions and the Building Common Area, including roofing and covering materials; foundations (excluding any architectural slabs, but including any structural slabs); exterior walls; plumbing; fire sprinkler and life safety systems (if any); base Building HVAC systems up to the first damper or isolation valve that serves the Premises (for purposes of clarity, the portion of the HVAC system that includes such first damper or isolation valve and extends into and through the Premises, whether serving the Lab Zone or Office Zone, and any supplemental HVAC serving the Premises, shall not be part of the base Building HVAC

and shall be Tenant's obligation to maintain and repair pursuant to Section 18.2 below); the Acid Neutralization Tank and associated monitoring system; the Base Building Laboratory Support Systems; elevators; and base Building electrical systems. The Base Building Laboratory Support Systems include the following base Building systems: (i) vacuum and compressed air; (ii) purified water and (iii) laboratory waste water treatment, and shall include only the portion of such system that extends to the isolation valve for such system that serves the Premises; Tenant hereby agreeing that any such isolation valve and the portion of such system that extends from such isolation valve to and in the Premises (a "Premises Laboratory Support System") is not a Base Building Laboratory Support System. To the extent that a Base Building Laboratory Support System does not include an isolation valve that serves the Premises, then only the portion of such system that is located outside of the Premises shall constitute a Base Building Laboratory Support System, and any portion of such system that is located inside the Premises shall be a Premises Laboratory Support System. Tenant shall repair and maintain each Premises Laboratory Support System in accordance with Section 18.2 of this Lease. Further, and with respect to the Base Building Laboratory Support System that is the purified water system for the Building, such system provides only water that has been treated by reverse osmosis, and Landlord makes no representations or warranties with respect to the purity or quality of such water and shall incur no liability whatsoever with respect to the purity, quality or any other condition of such water, and Tenant, at Tenant's sole cost and expense, shall be solely responsible for the purity, quality and condition of the water from such purified water system that Tenant may elect to use in the Premises.

18.2. Except for services of Landlord, if any, required by Section 18.1, Tenant shall at Tenant's sole cost and expense maintain and keep the Premises and every part thereof (including but not limited to each Premises Laboratory Support System, the portion of the HVAC system, whether serving the Lab Zone or Office Zone, that includes such first damper or isolation valve and extends into and through the Premises, any supplemental HVAC serving the Premises, any systems or equipment exclusively serving the Premises and any lightbulbs, lamps and ballasts in the Premises) in good condition and repair, damage thereto from ordinary wear and tear excepted, and shall, within ten (10) days after receipt of written notice from Landlord, provide to Landlord any maintenance records that Landlord reasonably requests, and to the extent Landlord determines that a third-party expert is necessary to review or evaluate any such records relating to systems serving Tenant's Premises, Tenant shall reimburse Landlord for Landlord's actual out-of-pocket costs and expenses related thereto. Tenant shall, upon the expiration or sooner termination of the Term, surrender the Premises to Landlord in as good a condition as when the Tenant Improvements are finally completed by Landlord, and with respect to Alterations, in substantially the same condition as existed on the date such Alterations are substantially completed by Tenant, ordinary wear and tear excepted; and shall, at Landlord's request and Tenant's sole cost and expense, remove all telephone and data systems, wiring and equipment from the Premises (with respect to wiring, only to the extent installed by a Tenant Party (as defined below)), and repair any damage to the Premises caused thereby. Landlord shall have no obligation to alter, remodel, improve, repair, decorate or paint the Premises or any part thereof, other than pursuant to the terms and provisions of the Work Letter.

18.3. Landlord shall not be liable for any failure to make any repairs or to perform any maintenance that is Landlord's obligation pursuant to this Lease unless such failure shall persist for an unreasonable time after Tenant provides Landlord with written notice of the need of such repairs or maintenance. Tenant waives its rights under Applicable Laws now or hereafter in effect to make repairs at Landlord's expense.

18.4. If any excavation shall be made upon land adjacent to or under the Building, or shall be authorized to be made, Tenant shall afford to the person causing or authorized to cause such excavation, license to enter the Premises for the purpose of performing such work as such person shall deem necessary or desirable to preserve and protect the Building from injury or damage and to support the same by proper foundations, without any claim for damages or liability against Landlord and without reducing or otherwise affecting Tenant's obligations under this Lease.

18.5. This Article relates to repairs and maintenance arising in the ordinary course of operation of the Building and the Project. In the event of a casualty described in Article 24, Article 24 shall apply in lieu of this Article. In the event of eminent domain, Article 25 shall apply in lieu of this Article.

18.6. Costs incurred by Landlord pursuant to this Article shall constitute Operating Expenses or Laboratory Support Expenses, as may be reasonably allocated by Landlord.

19. Liens.

19.1. Subject to the immediately succeeding sentence, Tenant shall keep the Premises, the Building and the Project free from any liens arising out of work or services performed, materials furnished to or obligations incurred by Tenant. Tenant further covenants and agrees that any mechanic's or materialman's lien filed against the Premises, the Building or the Project for work or services claimed to have been done for, or materials claimed to have been furnished to, or obligations incurred by Tenant shall be discharged or bonded by Tenant within ten (10) days after the filing thereof, at Tenant's sole cost and expense.

19.2. Should Tenant fail to discharge or bond against any lien of the nature described in Section 19.1, Landlord may, at Landlord's election, pay such claim or post a statutory lien bond or otherwise provide security to eliminate the lien as a claim against title, and Tenant shall immediately reimburse Landlord for the costs thereof as Additional Rent. Tenant shall indemnify, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold the Landlord Indemnitees harmless from and against any Claims arising from any such liens, including any administrative, court or other legal proceedings related to such liens.

19.3. In the event that Tenant leases or finances the acquisition of office equipment, furnishings or other personal property of a removable nature utilized by Tenant in the operation of Tenant's business, Tenant warrants that any Uniform Commercial Code financing statement shall, upon its face or by exhibit thereto, indicate that such financing statement is applicable only to removable personal property of Tenant located within the Premises. In no event shall the address of the Premises, the Building or the Project be furnished on a financing statement without qualifying language as to applicability of the lien only to removable personal property located in an identified suite leased by Tenant. Should any holder of a financing statement record or place of record a financing statement that appears to constitute a lien against any interest of Landlord or against equipment that may be located other than within an identified

suite leased by Tenant, Tenant shall, within ten (10) days after filing such financing statement, cause (a) a copy of the lender security agreement or other documents to which the financing statement pertains to be furnished to Landlord to facilitate Landlord's ability to demonstrate that the lien of such financing statement is not applicable to Landlord's interest and (b) Tenant's lender to amend such financing statement and any other documents of record to clarify that any liens imposed thereby are not applicable to any interest of Landlord in the Premises, the Building or the Project.

20. Estoppel Certificate. Tenant shall, within ten (10) days after receipt of written notice from Landlord, execute, acknowledge and deliver a statement in writing substantially in the form attached to this Lease as Exhibit I, or on any other form reasonably requested by a current or proposed Lender or encumbrancer or proposed purchaser, (a) certifying that this Lease is unmodified and in full force and effect (or, if modified, stating the nature of such modification and certifying that this Lease as so modified is in full force and effect) and the dates to which rental and other charges are paid in advance, if any, (b) acknowledging that there are not, to Tenant's knowledge, any uncured defaults on the part of Landlord hereunder, or specifying such defaults if any are claimed, and (c) setting forth such further information with respect to this Lease or the Premises as may be requested thereon. Any such statements may be relied upon by any prospective purchaser or encumbrancer of all or any portion of the Property. Tenant's failure to deliver any such statement within such the prescribed time shall, at Landlord's option, constitute a Default (as defined below) under this Lease, and, in any event, shall be binding upon Tenant that the Lease is in full force and effect and without modification except as may be represented by Landlord in any certificate prepared by Landlord and delivered to Tenant for execution.

21. Hazardous Materials.

21.1. Tenant shall not cause or permit any Hazardous Materials (as defined below) to be brought upon, kept or used in or about the Premises, the Building or the Project in violation of Applicable Laws by Tenant or any of its employees, agents, contractors or invitees (collectively with Tenant, each a "Tenant Party"). If (a) Tenant breaches such obligation, (b) the presence of Hazardous Materials as a result of such a breach results in contamination of the Project, any portion thereof, or any adjacent property, (c) contamination of the Premises otherwise occurs during the Term or any extension or renewal hereof or holding over hereunder or (d) contamination of the Project occurs as a result of Hazardous Materials that are placed on or under or are released into the Project by a Tenant Party, then Tenant shall indemnify, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold the Landlord Indemnitees harmless from and against any and all Claims of any kind or nature, including (w) diminution in value of the Project or any portion thereof, (x) damages for the loss or restriction on use of rentable or usable space or of any amenity of the Project, (y) damages arising from any adverse impact on marketing of space in the Project or any portion thereof and (z) sums paid in settlement of Claims that arise before, during or after the Term as a result of such breach or contamination. This indemnification by Tenant includes costs incurred in connection with any investigation of site conditions or any clean-up, remedial, removal or restoration work required by any Governmental Authority because of Hazardous Materials present in the air, soil or groundwater above, on, under or about the Project. Without limiting the foregoing, if the presence of any Hazardous Materials in, on, under or about the Project, any

portion thereof or any adjacent property caused or permitted by any Tenant Party results in any contamination of the Project, any portion thereof or any adjacent property, then Tenant shall promptly take all actions at its sole cost and expense as are necessary to return the Project, any portion thereof or any adjacent property to its respective condition existing prior to the time of such contamination; provided that Landlord's written approval of such action shall first be obtained, which approval Landlord shall not unreasonably withhold; and provided, further, that it shall be reasonable for Landlord to withhold its consent if such actions could have a material adverse long-term or short-term effect on the Project, any portion thereof or any adjacent property. Tenant's obligations under this Section shall not be affected, reduced or limited by any limitation on the amount or type of damages, compensation or benefits payable by or for Tenant under workers' compensation acts, disability benefit acts, employee benefit acts or similar legislation.

21.2. Landlord acknowledges that it is not the intent of this Article to prohibit Tenant from operating its business for the Permitted Use. Tenant may operate its business according to the custom of Tenant's industry so long as the use or presence of Hazardous Materials is strictly and properly monitored in accordance with Applicable Laws. As a material inducement to Landlord to allow Tenant to use Hazardous Materials in connection with its business, Tenant agrees to deliver to Landlord (a) a list identifying each type of Hazardous Material to be present at the Premises that is subject to regulation under any environmental Applicable Laws in the form of a Tier II form pursuant to Section 312 of the Emergency Planning and Community Right-to-Know Act of 1986 (or any successor statute) or any other form reasonably requested by Landlord, (b) a list of any and all approvals or permits from Governmental Authorities required in connection with the presence of such Hazardous Material at the Premises and (c) correct and complete copies of (i) notices of violations of Applicable Laws related to Hazardous Materials and (ii) plans relating to the installation of any storage tanks to be installed in, on, under or about the Project (provided that installation of storage tanks shall only be permitted after Landlord has given Tenant its written consent to do so, which consent Landlord may withhold in its sole and absolute discretion) and closure plans or any other documents required by any and all Governmental Authorities for any storage tanks installed in, on, under or about the Project for the closure of any such storage tanks (collectively, "Hazardous Materials Documents"). Tenant shall deliver to Landlord updated Hazardous Materials Documents, within fourteen (14) days after receipt of a written request therefor from Landlord, not more often than once per year, unless (m) there are any changes to the Hazardous Materials Documents or (n) Tenant initiates any Alterations or changes its business, in either case in a way that involves any material increase in the types or amounts of Hazardous Materials, in which case Tenant shall deliver updated Hazardous Materials documents (without Landlord having to request them) before or, if not practicable to do so before, as soon as reasonably practicable after the occurrence of the events in Subsection 21.2(m) or (n). For each type of Hazardous Material listed, the Hazardous Materials Documents shall include (t) the chemical name, (u) the material state (e.g., solid, liquid, gas or cryogen), (v) the concentration, (w) the storage amount and storage condition (e.g., in cabinets or not in cabinets), (x) the use amount and use condition (e.g., open use or closed use), (y) the location (e.g., room number or other identification) and (z) if known, the chemical abstract service number. Notwithstanding anything in this Section to the contrary, Tenant shall not be required to provide Landlord with any documents containing information of a proprietary nature, unless such documents contain a reference to Hazardous Materials or activities related to Hazardous Materials. Landlord may, at Landlord's expense, cause the Hazardous Materials

Documents to be reviewed by a person or firm qualified to analyze Hazardous Materials to confirm compliance with the provisions of this Lease and with Applicable Laws. In the event that a review of the Hazardous Materials Documents indicates non-compliance with this Lease or Applicable Laws, Tenant shall, at its expense, diligently take steps to bring its storage and use of Hazardous Materials into compliance. Notwithstanding anything in this Lease to the contrary or Landlord's review into Tenant's Hazardous Materials Documents or use or disposal of hazardous materials, however, Landlord shall not have and expressly disclaims any liability related to Tenant's or other tenants' use or disposal of Hazardous Materials, it being acknowledged by Tenant that Tenant is best suited to evaluate the safety and efficacy of its Hazardous Materials usage and procedures.

21.3. Tenant represents and warrants to Landlord that is not nor has it been, in connection with the use, disposal or storage of Hazardous Materials, (a) subject to a material enforcement order issued by any Governmental Authority or (b) required to take any remedial action.

21.4. Upon at least two (2) business days prior written notice to Tenant (unless Landlord reasonably believes testing must be completed sooner), prior to the expiration of the Term, Landlord shall have the right to conduct appropriate tests of the Project or any portion thereof to demonstrate that Hazardous Materials are present or that contamination has occurred due to the acts or omissions of a Tenant Party. Tenant shall pay all reasonable costs of such tests if such tests reveal that Hazardous Materials exist at the Project in violation of this Lease.

21.5. If underground or other storage tanks storing Hazardous Materials installed or utilized by Tenant are located on the Premises, or are hereafter placed on the Premises by Tenant (or by any other party, if such storage tanks are utilized by Tenant), then Tenant shall monitor the storage tanks, maintain appropriate records, implement reporting procedures, properly close any underground storage tanks, and take or cause to be taken all other steps necessary or required under the Applicable Laws. Tenant shall have no responsibility or liability for underground or other storage tanks installed by anyone other than Tenant unless Tenant utilizes such tanks, in which case Tenant's responsibility for such tanks shall be as set forth in this Section.

21.6. Tenant shall promptly report to Landlord any actual or suspected presence of mold or water intrusion at the Premises.

21.7. Tenant's obligations under this Article shall survive the expiration or earlier termination of the Lease. During any period of time needed by Tenant or Landlord after the termination of this Lease to complete the removal from the Premises of any such Hazardous Materials, Tenant shall be deemed a holdover tenant and subject to the provisions of Article 27.

21.8. As used herein, the term "Hazardous Material" means any toxic, explosive, corrosive, flammable, infectious, radioactive, carcinogenic, mutagenic or otherwise hazardous substance, material or waste that is or becomes regulated by Applicable Laws or any Governmental Authority.

21.9. Notwithstanding anything to the contrary in this Lease, Landlord shall have sole control over the equitable allocation of fire control areas (as defined in the Uniform Building Code as adopted by the city or municipality(ies) in which the Project is located (the "UBC")) within the Project for the storage of Hazardous Materials. Notwithstanding anything to the contrary in this Lease, the quantity of Hazardous Materials allowed by this Section is specific to Tenant and shall not run with the Lease in the event of a Transfer (as defined in Article 29). In the event of a Transfer, if the use of Hazardous Materials by such new tenant ("New Tenant") is such that New Tenant utilizes fire control areas in the Project in excess of New Tenant's Pro Rata Share of the Laboratory Building, then New Tenant shall, at its sole cost and expense and upon Landlord's written request, establish and maintain a separate area of the Premises classified by the UBC as an "H" occupancy area for the use and storage of Hazardous Materials, or take such other action as is necessary to ensure that its share of the fire control areas of the Building is not greater than New Tenant's Pro Rata Share of the Laboratory Building. Notwithstanding anything in this Lease to the contrary, Landlord shall not have and expressly disclaims any liability related to Tenant's or other tenants' use or disposal of fire control areas, it being acknowledged by Tenant that Tenant and other tenants are best suited to evaluate the safety and efficacy of its Hazardous Materials usage and procedures.

22. Odors and Exhaust. Tenant acknowledges that Landlord would not enter into this Lease with Tenant unless Tenant assured Landlord that under no circumstances will any other occupants of the Building or the Project (including persons legally present in any outdoor areas of the Project) be subjected to odors or fumes (whether or not noxious), and that the Building and the Project will not be damaged by any exhaust, in each case from Tenant's operations. Landlord and Tenant therefore agree as follows:

22.1. Tenant shall not cause or permit (or conduct any activities that would cause) any release of any odors or fumes of any kind from the Premises.

22.2. If the Building has a ventilation system that, in Landlord's judgment, is adequate, suitable, and appropriate to vent the Premises in a manner that does not release odors affecting any indoor or outdoor part of the Project, Tenant shall vent the Premises through such system. If Landlord at any time determines that any existing ventilation system is inadequate, or if no ventilation system exists, Tenant shall in compliance with Applicable Laws vent all fumes and odors from the Premises (and remove odors from Tenant's exhaust stream) as Landlord requires. The placement and configuration of all ventilation exhaust pipes, louvers and other equipment shall be subject to Landlord's approval. Tenant acknowledges Landlord's legitimate desire to maintain the Project (indoor and outdoor areas) in an odor-free manner, and Landlord may require Tenant to abate and remove all odors in a manner that goes beyond the requirements of Applicable Laws.

22.3. Tenant shall, at Tenant's sole cost and expense, provide odor eliminators and other devices (such as filters, air cleaners, scrubbers and whatever other equipment may in Landlord's judgment be necessary or appropriate from time to time) to completely remove, eliminate and abate any odors, fumes or other substances in Tenant's exhaust stream that, in Landlord's judgment, emanate from Tenant's Premises. Any work Tenant performs under this Section shall constitute Alterations.

22.4. Tenant's responsibility to remove, eliminate and abate odors, fumes and exhaust shall continue throughout the Term. Landlord's construction of the Tenant Improvements shall not preclude Landlord from requiring additional measures to eliminate odors, fumes and other adverse impacts of Tenant's exhaust stream (as Landlord may designate in Landlord's discretion). Tenant shall install additional equipment as Landlord requires from time to time under the preceding sentence. Such installations shall constitute Alterations.

22.5. If Tenant fails to install satisfactory odor control equipment within ten (10) business days after Landlord's demand made at any time, then Landlord may, without limiting Landlord's other rights and remedies, require Tenant to cease and suspend any operations in the Premises that, in Landlord's determination, cause odors, fumes or exhaust. For example, if Landlord determines that Tenant's production of a certain type of product causes odors, fumes or exhaust, and Tenant does not install satisfactory odor control equipment within ten (10) business days after Landlord's request, then Landlord may require Tenant to stop producing such type of product in the Premises unless and until Tenant has installed odor control equipment satisfactory to Landlord.

23. Insurance; Waiver of Subrogation.

23.1. Landlord shall maintain insurance for the Building and the Project in amounts equal to full replacement cost (exclusive of the costs of excavation, foundations and footings, engineering costs or such other costs to the extent the same are not incurred in the event of a rebuild and without reference to depreciation taken by Landlord upon its books or tax returns) or such lesser coverage as Landlord may elect, provided that such coverage shall not be less than the amount of such insurance Landlord's Lender, if any, requires Landlord to maintain, providing protection against any peril generally included within the classification "Fire and Extended Coverage," together with insurance against sprinkler damage (if applicable), vandalism and malicious mischief. Landlord, subject to availability thereof, shall further insure, if Landlord deems it appropriate, coverage against flood, environmental hazard, earthquake, loss or failure of building equipment, rental loss during the period of repairs or rebuilding, Workers' Compensation insurance and fidelity bonds for employees employed to perform services. Notwithstanding the foregoing, Landlord may, but shall not be deemed required to, provide insurance for any improvements installed by Tenant or that are in addition to the standard improvements customarily furnished by Landlord, without regard to whether or not such are made a part of or are affixed to the Building.

23.2. In addition, Landlord shall carry Commercial General Liability insurance with limits of not less than One Million Dollars ($1,000,000) per occurrence/general aggregate for bodily injury (including death), or property damage with respect to the Project.

23.3. Tenant shall, at its own cost and expense, procure and maintain during the Term the following insurance for the benefit of Tenant and Landlord (as their interests may appear) with insurers financially acceptable and lawfully authorized to do business in the state where the Premises are located:

(a) Commercial General Liability insurance on a broad-based occurrence coverage form, with coverages including but not limited to bodily injury (including death), property damage (including loss of use resulting therefrom), premises/operations, personal & advertising injury, and contractual liability with limits of liability of not less than $2,000,000 for bodily injury and property damage per occurrence, $2,000,000 general aggregate, which limits may be met by use of excess and/or umbrella liability insurance provided that such coverage is at least as broad as the primary coverages required herein.

(b) Commercial Automobile Liability insurance covering liability arising from the use or operation of any auto, including those owned, hired or otherwise operated or used by or on behalf of the Tenant. The coverage shall be on a broad-based occurrence form with combined single limits of not less than $1,000,000 per accident for bodily injury and property damage.

(c) Commercial Property insurance covering property damage to the full replacement cost value and business interruption. Covered property shall include all tenant improvements in the Premises (to the extent not insured by Landlord pursuant to Section 23.1) and Tenant's Property including personal property, furniture, fixtures, machinery, equipment, stock, inventory and improvements and betterments, which may be owned by Tenant or Landlord and required to be insured hereunder, or which may be leased, rented, borrowed or in the care custody or control of Tenant, or Tenant's agents, employees or subcontractors. Such insurance, with respect only to all Tenant Improvements, Alterations or other work performed on the Premises by Tenant (collectively, "Tenant Work"), shall name Landlord and Landlord's current and future mortgagees as loss payees as their interests may appear. Such insurance shall be written on an "all risk" of physical loss or damage basis including the perils of fire, extended coverage, electrical injury, mechanical breakdown, windstorm, vandalism, malicious mischief, sprinkler leakage, back-up of sewers or drains, flood, terrorism and such other risks Landlord may from time to time designate, for the full replacement cost value of the covered items with an agreed amount endorsement with no co-insurance. Business interruption coverage shall have limits sufficient to cover Tenant's lost profits and necessary continuing expenses, including rents due Landlord under the Lease. The minimum period of indemnity for business interruption coverage shall be twelve (12) months.

(d) Workers' Compensation insurance as is required by statute or law, or as may be available on a voluntary basis and Employers' Liability insurance with limits of not less than the following: each accident, Five Hundred Thousand Dollars ($500,000); disease ($500,000); disease (each employee), Five Hundred Thousand Dollars ($500,000).

(e) Pollution Legal Liability insurance is not currently required based on the Hazardous Materials Documents that Tenant delivered to Landlord as of the Execution Date. If the Hazardous Materials Documents change during the Term and Tenant continues to store, handle, generate or treat Hazardous Materials on or about the Premises or other circumstances change related to Tenant's use of Hazardous Materials on or about the Premises, Landlord reserves the right, in Landlord's sole discretion, to require Tenant to obtain Pollution Legal Liability insurance. Such coverage shall include bodily injury, sickness, disease, death or mental anguish or shock sustained by any person; property damage including physical injury to or destruction of tangible property including the resulting loss of use thereof, clean-up costs, and the loss of use of tangible property that has not been physically injured or destroyed; and defense costs, charges and expenses incurred in the investigation, adjustment or defense of claims for such compensatory damages. Coverage shall apply to both sudden and non-sudden pollution conditions including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water. Claims-made coverage is permitted, provided the policy retroactive date is continuously maintained prior to the commencement date of this agreement, and coverage is continuously maintained during all periods in which Tenant occupies the Premises. Coverage shall be maintained with limits of not less than $1,000,000 per incident with a $2,000,000 policy aggregate and for a period of two (2) years thereafter.

(f) During all construction by Tenant at the Premises, with respect to tenant improvements being constructed (including any Alterations, insurance required in Exhibit B-1) must be in place.

23.4. The insurance required of Tenant by this Article shall be with companies at all times having a current rating of not less than A- and financial category rating of at least Class VII in "A.M. Best's Insurance Guide" current edition. Tenant shall obtain for Landlord from the insurance companies/broker or cause the insurance companies/broker to furnish certificates of insurance evidencing all coverages required herein to Landlord. Landlord reserves the right to require complete, certified copies of all required insurance policies including any endorsements. No such policy shall be cancelable or subject to reduction of coverage or other modification or cancellation except after twenty (20) days' prior written notice to Landlord from Tenant or its insurers (except in the event of non-payment of premium, in which case ten (10) days' written notice shall be given). All such policies shall be written as primary policies, not contributing with and not in excess of the coverage that Landlord may carry. Tenant's required policies shall contain severability of interests clauses stating that, except with respect to limits of insurance, coverage shall apply separately to each insured or additional insured. Tenant shall, prior to the expiration of such policies, furnish Landlord with renewal certificates of insurance or binders. Tenant agrees that if Tenant does not take out and maintain such insurance, Landlord may (but shall not be required to) procure such insurance on Tenant's behalf and at its cost to be paid by Tenant as Additional Rent. Commercial General Liability, Commercial Automobile Liability, Umbrella Liability, and Pollution Legal Liability insurance as required above shall name Landlord, BioMed Realty, L.P., and BRE Edison Parent L.P., and their respective officers, employees, agents, general partners, members, subsidiaries, affiliates and Lenders ("Landlord Parties") as additional insureds as respects liability arising from work or operations performed by or on behalf of Tenant, Tenant's use or occupancy of Premises, and ownership, maintenance or use of vehicles by or on behalf of Tenant.

23.5. In each instance where insurance is to name Landlord Parties as additional insureds, Tenant shall, upon Landlord's written request, also designate and furnish certificates evidencing such Landlord Parties as additional insureds to (a) any Lender of Landlord holding a security interest in the Building or the Project, (b) the landlord under any lease whereunder Landlord is a tenant of the real property upon which the Building is located if the interest of Landlord is or shall become that of a tenant under a ground lease rather than that of a fee owner and (c) any management company retained by Landlord to manage the Project.

23.6. Tenant assumes the risk of damage to any fixtures, goods, inventory, merchandise, equipment and leasehold improvements, and Landlord shall not be liable for injury to Tenant's business or any loss of income therefrom, relative to such damage, all as more particularly set forth within this Lease. Tenant shall, at Tenant's sole cost and expense, carry such insurance as Tenant desires for Tenant's protection with respect to personal property of Tenant or business interruption.

23.7. Tenant and its insurers hereby waive any and all rights of recovery or subrogation against the Landlord Parties with respect to any loss, damage, claims, suits or demands, howsoever caused, that are covered, or should have been covered, by valid and collectible insurance, including any deductibles or self-insurance maintained thereunder. If necessary, Tenant agrees to endorse the required insurance policies to permit waivers of subrogation as required hereunder and hold harmless and indemnify the Landlord Parties for any loss or expense incurred as a result of a failure to obtain such waivers of subrogation from insurers. Tenant, upon obtaining the policies of insurance required or permitted under this Lease, shall give notice to its insurance carriers that the foregoing waiver of subrogation is contained in this Lease. If such policies shall not be obtainable with such waiver or shall be so obtainable only at a premium over that chargeable without such waiver, then Tenant shall notify Landlord of such conditions.

23.8. Landlord may require insurance policy limits required under this Lease to be raised to conform with requirements of Landlord's Lender or to bring coverage limits to levels then being required of new tenants within the Project.

23.9. Any costs incurred by Landlord pursuant to this Article shall constitute a portion of Operating Expenses.

23.10. The provisions of this Article shall survive the expiration or earlier termination of this Lease.

24. Damage or Destruction.

24.1. In the event of a partial destruction of (a) the Premises, (b) the Building, (c) the Common Area or (d) the Project ((a)-(d) collectively, the "Affected Areas") by fire or other perils covered by extended coverage insurance not exceeding twenty-five percent (25%) of the full insurable value thereof, and provided that (x) the damage thereto is such that the Affected Areas may be repaired, reconstructed or restored within a period of six (6) months from the date of the happening of such casualty, (y) Landlord shall receive insurance proceeds sufficient to cover the cost of such repairs, reconstruction and restoration (except for any deductible amount provided by Landlord's policy, which deductible amount, if paid by Landlord, shall constitute an Operating Expense) and (z) such casualty was not intentionally caused by a Tenant Party, then Landlord shall commence and proceed diligently with the work of repair, reconstruction and restoration of the Affected Areas and this Lease shall continue in full force and effect.

24.2. In the event of any damage to or destruction of the Building or the Project other than as described in Section 24.1, Landlord may elect to repair, reconstruct and restore the Building or the Project, as applicable, in which case this Lease shall continue in full force and effect. If Landlord elects not to repair, reconstruct and restore the Building or the Project, as applicable, then this Lease shall terminate as of the date of such damage or destruction. In the event of any damage or destruction (regardless of whether such damage is governed by Section 24.1 or this Section), if (a) in Landlord's determination as set forth in the Damage Repair Estimate (as defined below), the Affected Areas cannot be repaired, reconstructed or restored

within twelve (12) months after the date of the Damage Repair Estimate, (b) subject to Section 24.6, the Affected Areas are not actually repaired, reconstructed and restored within eighteen (18) months after the date of the Damage Repair Estimate, or (c) the damage and destruction occurs within the last twelve (12) months of the then-current Term, then Tenant shall have the right to terminate this Lease, effective as of the date of such damage or destruction, by delivering to Landlord its written notice of termination (a "Termination Notice") (y) with respect to Subsections 24.2(a) and (c), no later than fifteen (15) days after Landlord delivers to Tenant Landlord's Damage Repair Estimate and (z) with respect to Subsection 24.2(b), no later than fifteen (15) days after such twelve (12) month period (as the same may be extended pursuant to Section 24.6) expires. If Tenant provides Landlord with a Termination Notice pursuant to Subsection 24.2(z), Landlord shall have an additional thirty (30) days after receipt of such Termination Notice to complete the repair, reconstruction and restoration. If Landlord does not complete such repair, reconstruction and restoration within such thirty (30) day period, then Tenant may terminate this Lease by giving Landlord written notice within two (2) business days after the expiration of such thirty (30) day period. If Landlord does complete such repair, reconstruction and restoration within such thirty (30) day period, then this Lease shall continue in full force and effect.

24.3. As soon as reasonably practicable, but in any event within sixty (60) days following the date of damage or destruction, Landlord shall notify Tenant of Landlord's good faith estimate of the period of time in which the repairs, reconstruction and restoration will be completed (the "Damage Repair Estimate"), which estimate shall be based upon the opinion of a contractor reasonably selected by Landlord and experienced in comparable repair, reconstruction and restoration of similar buildings. Additionally, Landlord shall give written notice to Tenant within sixty (60) days following the date of damage or destruction of its election not to repair, reconstruct or restore the Building or the Project, as applicable.

24.4. Upon any termination of this Lease under any of the provisions of this Article, the parties shall be released thereby without further obligation to the other from the date possession of the Premises is surrendered to Landlord, except with regard to (a) items occurring prior to the damage or destruction and (b) provisions of this Lease that, by their express terms, survive the expiration or earlier termination hereof.

24.5. In the event of repair, reconstruction and restoration as provided in this Article, all Rent to be paid by Tenant under this Lease shall be abated proportionately based on the extent to which Tenant's use of the Premises is impaired during the period of such repair, reconstruction or restoration, unless Landlord provides Tenant with other space during the period of repair, reconstruction and restoration that, in Tenant's reasonable opinion, is suitable for the temporary conduct of Tenant's business; provided, however, that the amount of such abatement shall be reduced by the amount of Rent that is received by Tenant as part of the business interruption or loss of rental income with respect to the Premises from the proceeds of business interruption or loss of rental income insurance.

24.6. Notwithstanding anything to the contrary contained in this Article, should Landlord be delayed or prevented from completing the repair, reconstruction or restoration of the damage or destruction to the Premises after the occurrence of such damage or destruction by Force Majeure or delays caused by a Tenant Party, then the time for Landlord to commence or complete repairs, reconstruction and restoration shall be extended on a day-for-day basis; provided, however, that, at Landlord's election, Landlord shall be relieved of its obligation to make such repairs, reconstruction and restoration.

24.7. If Landlord is obligated to or elects to repair, reconstruct or restore as herein provided, then Landlord shall be obligated to make such repairs, reconstruction or restoration only with regard to (a) those portions of the Premises that were originally provided at Landlord's expense and (b) the Common Area portion of the Affected Areas. The repairs, reconstruction or restoration of improvements not originally provided by Landlord or at Landlord's expense shall be the obligation of Tenant. In the event Tenant has elected to upgrade certain improvements from the Building Standard, Landlord shall, upon the need for replacement due to an insured loss, provide only the Building Standard, unless Tenant again elects to upgrade such improvements and pay any incremental costs related thereto, except to the extent that excess insurance proceeds, if received, are adequate to provide such upgrades, in addition to providing for basic repairs, reconstruction and restoration of the Premises, the Building and the Project.

24.8. Notwithstanding anything to the contrary contained in this Article, Landlord shall not have any obligation whatsoever to repair, reconstruct or restore the Premises if the damage resulting from any casualty covered under this Article occurs during the last twenty-four (24) months of the Term or any extension thereof, or to the extent that insurance proceeds are not available therefor.

24.9. Landlord's obligation, should it elect or be obligated to repair, reconstruct or restore, shall be limited to the Affected Areas, and shall be conditioned upon Landlord receiving any permits or authorizations required by Applicable Laws. Tenant shall, at its expense, replace or fully repair all of Tenant's personal property and any Alterations installed by Tenant existing at the time of such damage or destruction. If Affected Areas are to be repaired, reconstructed or restored in accordance with the foregoing, Landlord shall make available to Tenant any portion of insurance proceeds it receives that are allocable to the Alterations constructed by Tenant pursuant to this Lease; provided Tenant is not then in default under this Lease, and subject to the requirements of any Lender of Landlord.

24.10. This Article sets forth the terms and conditions upon which this Lease may terminate in the event of any damage or destruction. Accordingly, the parties hereby waive the provisions of any Applicable Laws (and any successor statutes) permitting the parties to terminate this Lease as a result of any damage or destruction.

25. Eminent Domain.

25.1. In the event (a) the whole of all Affected Areas or (b) such part thereof as shall substantially interfere with Tenant's use and occupancy of the Premises for the Permitted Use shall be taken for any public or quasi-public purpose by any lawful power or authority by exercise of the right of appropriation, condemnation or eminent domain, or sold to prevent such taking, Tenant or Landlord may terminate this Lease effective as of the date possession is required to be surrendered to such authority, except with regard to (y) items occurring prior to the taking and (z) provisions of this Lease that, by their express terms, survive the expiration or earlier termination hereof.

25.2. In the event of a partial taking of (a) the Building or the Project or (b) drives, walkways or parking areas serving the Building or the Project for any public or quasi-public purpose by any lawful power or authority by exercise of right of appropriation, condemnation, or eminent domain, or sold to prevent such taking, then, without regard to whether any portion of the Premises occupied by Tenant was so taken, Landlord may elect to terminate this Lease (except with regard to (y) items occurring prior to the taking and (z) provisions of this Lease that, by their express terms, survive the expiration or earlier termination hereof) as of such taking if such taking is, in Landlord's sole opinion, of a material nature such as to make it uneconomical to continue use of the unappropriated portion for purposes of renting office or laboratory space.

25.3. Tenant shall be entitled to any award that is specifically awarded as compensation for (a) the taking of Tenant's personal property that was installed at Tenant's expense and (b) the costs of Tenant moving to a new location. Except as set forth in the previous sentence, any award for such taking shall be the property of Landlord.

25.4. If, upon any taking of the nature described in this Article, this Lease continues in effect, then Landlord shall promptly proceed to restore the Affected Areas to substantially their same condition prior to such partial taking. To the extent such restoration is infeasible, as determined by Landlord in its sole and absolute discretion, the Rent shall be decreased proportionately to reflect the loss of any portion of the Premises no longer available to Tenant.

25.5. This Article sets forth the terms and conditions upon which this Lease may terminate in the event of any damage or destruction. Accordingly, the parties hereby waive the provisions of any Applicable Laws (and any successor statutes) permitting the parties to terminate this Lease as a result of any damage or destruction.

26. Surrender.

26.1. At least thirty (30) days prior to Tenant's surrender of possession of any part of the Premises, Tenant shall provide Landlord with a facility decommissioning and Hazardous Materials closure plan for the Premises ("Exit Survey") prepared by an independent third party state-certified professional with appropriate expertise, which Exit Survey must be reasonably acceptable to Landlord. The Exit Survey shall comply with the American National Standards Institute's Laboratory Decommissioning guidelines (ANSI/AIHA Z9.11-2008) or any successor standards published by ANSI or any successor organization (or, if ANSI and its successors no longer exist, a similar entity publishing similar standards). In addition, at least ten (10) days prior to Tenant's surrender of possession of any part of the Premises, Tenant shall (a) provide Landlord with written evidence of all appropriate governmental releases obtained by Tenant in accordance with Applicable Laws, including laws pertaining to the surrender of the Premises, (b) place Laboratory Equipment Decontamination Forms on all decommissioned equipment to assure safe occupancy by future users and (c) conduct a site inspection with Landlord. In addition, Tenant agrees to remain responsible after the surrender of the Premises for the remediation of any recognized environmental conditions set forth in the Exit Survey and comply with any recommendations set forth in the Exit Survey. Tenant's obligations under this Section shall survive the expiration or earlier termination of the Lease.

26.2. No surrender of possession of any part of the Premises shall release Tenant from any of its obligations hereunder, unless such surrender is accepted in writing by Landlord.

26.3. The voluntary or other surrender of this Lease by Tenant shall not effect a merger with Landlord's fee title or leasehold interest in the Premises, the Building, the Property or the Project, unless Landlord consents in writing, and shall, at Landlord's option, operate as an assignment to Landlord of any or all subleases.

26.4. The voluntary or other surrender of any ground or other underlying lease that now exists or may hereafter be executed affecting the Building or the Project, or a mutual cancellation thereof or of Landlord's interest therein by Landlord and its lessor shall not effect a merger with Landlord's fee title or leasehold interest in the Premises, the Building or the Property and shall, at the option of the successor to Landlord's interest in the Building or the Project, as applicable, operate as an assignment of this Lease.

27. Holding Over.

27.1. If, with Landlord's prior written consent, Tenant holds possession of all or any part of the Premises after the Term, Tenant shall become a tenant from month to month after the expiration or earlier termination of the Term, and in such case Tenant shall continue to pay (a) Base Rent in accordance with Article 7, as adjusted in accordance with Article 8, and (b) any amounts for which Tenant would otherwise be liable under this Lease if the Lease were still in effect, including payments for Tenant's Adjusted Share of Operating Expenses and Tenant's Adjusted Share of Base Building Lab Systems. Any such month-to-month tenancy shall be subject to every other term, covenant and agreement contained herein.

27.2. Notwithstanding the foregoing, if Tenant remains in possession of the Premises after the expiration or earlier termination of the Term without Landlord's prior written consent, (a) Tenant shall become a tenant at sufferance subject to the terms and conditions of this Lease, except that the monthly rent shall be equal to one hundred fifty percent (150%) of the Rent in effect during the last thirty (30) days of the Term, and (b) Tenant shall be liable to Landlord for any and all damages suffered by Landlord as a result of such holdover, including any lost rent or consequential, special and indirect damages (in each case, regardless of whether such damages are foreseeable).

27.3. Acceptance by Landlord of Rent after the expiration or earlier termination of the Term shall not result in an extension, renewal or reinstatement of this Lease.

27.4. The foregoing provisions of this Article are in addition to and do not affect Landlord's right of reentry or any other rights of Landlord hereunder or as otherwise provided by Applicable Laws.

27.5. The provisions of this Article shall survive the expiration or earlier termination of this Lease.

28. Indemnification and Exculpation.

28.1. Tenant agrees to indemnify, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold the Landlord Indemnitees harmless from and against any and all Claims arising from injury to or death of any person or damage to any property occurring within or about the Premises, the Building, the Property or the Project, arising directly or indirectly out of (a) the presence at or use or occupancy of the Premises or Project or

the Property by a Tenant Party, (b) an act or omission on the part of any Tenant Party, (c) a breach or default by Tenant in the performance of any of its obligations hereunder or (d) injury to or death of persons or damage to or loss of any property, real or alleged, arising from the serving of alcoholic beverages at the Premises or Project, including liability under any dram shop law, host liquor law or similar Applicable Law, except to the extent directly caused by Landlord's negligence or willful misconduct. Tenant's obligations under this Section shall not be affected, reduced or limited by any limitation on the amount or type of damages, compensation or benefits payable by or for Tenant under workers' compensation acts, disability benefit acts, employee benefit acts or similar legislation. Tenant's obligations under this Section shall survive the expiration or earlier termination of this Lease. Subject to Sections 23.6, 28.2 and 31.12 and any subrogation provisions contained in the Work Letter, Landlord agrees to indemnify, save, defend (at Tenant's option and with counsel reasonably acceptable to Tenant) and hold the Tenant Parties harmless from and against any and all Claims arising from injury to or death of any person or damage to or loss of any physical property occurring within or about the Premises, the Building, the Property or the Project to the extent directly arising out of Landlord's gross negligence or willful misconduct.

28.2. Notwithstanding anything in this Lease to the contrary, Landlord shall not be liable to Tenant for and Tenant assumes all risk of (a) damage or losses caused by fire, electrical malfunction, gas explosion or water damage of any type (including broken water lines, malfunctioning fire sprinkler systems, roof leaks or stoppages of lines), unless any such loss is due to Landlord's willful disregard of written notice by Tenant of need for a repair that Landlord is responsible to make for an unreasonable period of time, and (b) damage to personal property or scientific research, including loss of records kept by Tenant within the Premises (in each case, regardless of whether such damages are foreseeable). Tenant further waives any claim for injury to Tenant's business or loss of income relating to any such damage or destruction of personal property as described in this Section. Notwithstanding anything in the foregoing or this Lease to the contrary, except (x) as otherwise provided herein (including Section 27.2), (y) as may be provided by Applicable Laws or (z) in the event of Tenant's breach of Article 21 or Section 26.1, in no event shall Landlord or Tenant be liable to the other for any consequential, special or indirect damages arising out of this Lease, including lost profits (provided that this Subsection 28.2(z) shall not limit Tenant's liability for Base Rent or Additional Rent pursuant to this Lease).

28.3. Landlord shall not be liable for any damages arising from any act, omission or neglect of any other tenant in the Building or the Project, or of any other third party.

28.4. Tenant acknowledges that security devices and services, if any, while intended to deter crime, may not in given instances prevent theft or other criminal acts. Landlord shall not be liable for injuries or losses caused by criminal acts of third parties, and Tenant assumes the risk that any security device or service may malfunction or otherwise be circumvented by a criminal. If Tenant desires protection against such criminal acts, then Tenant shall, at Tenant's sole cost and expense, obtain appropriate insurance coverage. Tenant's security programs and equipment for the Premises shall be coordinated with Landlord and subject to Landlord's reasonable approval.

28.5. The provisions of this Article shall survive the expiration or earlier termination of this Lease.

29. Assignment or Subletting.

29.1. Except as hereinafter expressly permitted, none of the following (each, a "Transfer"), either voluntarily or by operation of Applicable Laws, shall be directly or indirectly performed without Landlord's prior written consent, which consent shall not be unreasonably withheld, conditioned or delayed: (a) Tenant selling, hypothecating, assigning, pledging, encumbering or otherwise transferring this Lease or subletting the Premises or (b) a controlling interest in Tenant being sold, assigned or otherwise transferred (other than as a result of shares in Tenant being sold on a public stock exchange). Notwithstanding the immediately foregoing clause (b), Tenant shall have the right to obtain financing from institutional investors (including venture capital funding) which regularly invest in private biotechnology companies that results in a change in control of Tenant without such change of control constituting a Transfer under this Lease; provided that (i) any such financing is obtained primarily to increase the capitalization of Tenant and (ii) Tenant provides Landlord written notice of such financing promptly following the closing of such financing. For purposes of the first sentence of this Section 29.1, "control" means (a) owning (directly or indirectly) more than fifty percent (50%) of the stock or other equity interests of another person or (b) possessing, directly or indirectly, the power to direct or cause the direction of the management and policies of such person. Notwithstanding the foregoing, Tenant shall have the right to Transfer, without Landlord's prior written consent, Tenant's interest in this Lease or the Premises or any part thereof to (x) any person that as of the date of determination and at all times thereafter directly, or indirectly through one or more intermediaries, controls, is controlled by or is under common control with Tenant ("Tenant's Affiliate") or (y) any entity that succeeds to Tenant' interest in the Lease by reason of acquisition (whereby the acquisition consists of all or substantially all of Tenant's stock or assets), merger, spin-off or consolidation ("Tenant's Successor") or (z) any portfolio company of Atlas Ventures (an "Atlas Company") provided that with respect to a Transfer to an Atlas Company, such Transfer is a sublease or license only for not more than 15,000 contiguous square feet of Rentable Area; provided that Tenant shall notify Landlord in writing at least thirty (30) days prior to the effectiveness of such Transfer to Tenant's Affiliate, Tenant's Successor or an Atlas Company (an "Exempt Transfer") and otherwise comply with the requirements of this Lease regarding such Transfer; and provided, further, that the person that will be the tenant under this Lease after an Exempt Transfer under the immediately foregoing clauses (x) and (y) has a net worth (as of both the day immediately prior to and the day immediately after the Exempt Transfer) that is equal to or greater than the net worth (as of both the Execution Date and the date of the Exempt Transfer) of the transferring Tenant; and provided, further, that with respect to a Transfer to an Atlas Company under the immediately foregoing clause (z), if the first Transfer to an Atlas Company occurs during the first (1st) twelve months of the Term and the term of such sublease or license is not greater than three (3) years from the date of the sublease or license, then for such first Transfer only, the Required Financials (as hereinafter defined) of such Atlas Company shall be provided to Landlord but Landlord shall not have the right to approve same, and with respect to any other Transfer to an Atlas Company under the immediately foregoing clause (z), the Required Financials (as hereinafter defined) of such Atlas Company shall be reasonably satisfactory to Landlord. For purposes of the immediately preceding sentence, "control" requires both (a) owning (directly or indirectly) more than fifty percent (50%) of the stock or other equity interests of another person and (b) possessing, directly or indirectly, the power to direct or cause the direction of the management and policies of such person. In no event shall Tenant perform a Transfer to or with an entity that is a tenant at the Hampshire

Project or that is in active discussions with Landlord or an affiliate of Landlord to lease premises at the Project or a property owned by Landlord or an affiliate of Landlord. As used in the immediately foregoing sentence, the term "active discussion" shall mean a proposed transaction in which either Landlord (or its affiliate) or such entity (or their respective broker) has submitted in writing to the other (or to the other's broker) the material terms of a proposed lease transaction within thirty (30) days of Tenant offering a proposal to Landlord or such affiliate. Notwithstanding anything in this Lease to the contrary, if (a) Tenant or any proposed transferee, assignee or sublessee of Tenant has been required by any prior landlord, Lender or Governmental Authority to take material remedial action in connection with Hazardous Materials contaminating a property if the contamination resulted from such party's action or omission or use of the property in question or (b) Tenant or any proposed transferee, assignee or sublessee is subject to a material enforcement order issued by any Governmental Authority in connection with the use, disposal or storage of Hazardous Materials, then Landlord shall have the right to terminate this Lease in Landlord's sole and absolute discretion (with respect to any such matter involving Tenant), and it shall not be unreasonable for Landlord to withhold its consent to any proposed transfer, assignment or subletting (with respect to any such matter involving a proposed transferee, assignee or sublessee).

29.2. In the event Tenant desires to effect a Transfer, then, at least thirty (30) but not more than ninety (90) days prior to the date when Tenant desires the Transfer to be effective (the "Transfer Date"), Tenant shall provide written notice to Landlord (the "Transfer Notice") containing information (including references) concerning the character of the proposed transferee, assignee or sublessee; the Transfer Date; the most recent unconsolidated balance sheet, profit and loss statement, and statement of cash flow, as excerpts from audited financial statements, of Tenant and of the proposed transferee, assignee or sublessee satisfying the requirements of Section 40.2 ("Required Financials"); any ownership or commercial relationship between Tenant and the proposed transferee, assignee or sublessee; copies of Hazardous Materials Documents for the proposed transferee, assignee or sublessee; and the consideration and all other material terms and conditions of the proposed Transfer, all in such detail as Landlord shall reasonably require.

29.3. Landlord, in determining whether consent should be given to a proposed Transfer, may give consideration to (a) the financial strength of Tenant and of such transferee, assignee or sublessee (notwithstanding Tenant remaining liable for Tenant's performance), (b) any change in use that such transferee, assignee or sublessee proposes to make in the use of the Premises and (c) Landlord's desire to exercise its rights under Section 29.7 to cancel this Lease. In no event shall Landlord be deemed to be unreasonable for declining to consent to a Transfer to a transferee, assignee or sublessee of poor reputation, lacking financial qualifications or seeking a change in the Permitted Use, or jeopardizing directly or indirectly the status of Landlord or any of Landlord's affiliates as a Real Estate Investment Trust under the Internal Revenue Code of 1986 (as the same may be amended from time to time, the "Revenue Code"). Notwithstanding anything contained in this Lease to the contrary, (w) no Transfer shall be consummated on any basis such that the rental or other amounts to be paid by the occupant, assignee, manager or other transferee thereunder would be based, in whole or in part, on the income or profits derived by the business activities of such occupant, assignee, manager or other transferee; (x) Tenant shall not furnish or render any services to an occupant, assignee, manager or other transferee with respect to whom transfer consideration is required to be paid, or manage or operate the Premises or any

capital additions so transferred, with respect to which transfer consideration is being paid; (y) Tenant shall not consummate a Transfer with any person in which Landlord owns an interest, directly or indirectly (by applying constructive ownership rules set forth in Section 856(d)(5) of the Revenue Code); and (z) Tenant shall not consummate a Transfer with any person or in any manner that could cause any portion of the amounts received by Landlord pursuant to this Lease or any sublease, license or other arrangement for the right to use, occupy or possess any portion of the Premises to fail to qualify as "rents from real property" within the meaning of Section 856(d) of the Revenue Code, or any similar or successor provision thereto or which could cause any other income of Landlord to fail to qualify as income described in Section 856(c)(2) of the Revenue Code.

29.4. The following are conditions precedent to a Transfer or to Landlord considering a request by Tenant to a Transfer:

(a) Tenant shall remain fully liable under this Lease. Tenant agrees that it shall not be (and shall not be deemed to be) a guarantor or surety of this Lease, however, and waives its right to claim that is it is a guarantor or surety or to raise in any legal proceeding any guarantor or surety defenses permitted by this Lease or by Applicable Laws;

(b) If Tenant or the proposed transferee, assignee or sublessee does not or cannot deliver the Required Financials, then Landlord may elect to have either Tenant's ultimate parent company or the proposed transferee's, assignee's or sublessee's ultimate parent company provide a guaranty of the applicable entity's obligations under this Lease, in a form acceptable to Landlord, which guaranty shall be executed and delivered to Landlord by the applicable guarantor prior to the Transfer Date;

(c) In the case of an Exempt Transfer, Tenant shall provide Landlord with evidence reasonably satisfactory to Landlord that the Transfer qualifies as an Exempt Transfer;

(d) Tenant shall reimburse Landlord for Landlord's actual costs and expenses, including reasonable attorneys' fees, charges and disbursements incurred in connection with the review, processing and documentation of such request not to exceed $2,500;

(e) Except with respect to an Exempt Transfer, if Tenant's transfer of rights or sharing of the Premises provides for the receipt by, on behalf of or on account of Tenant of any consideration of any kind whatsoever (including a premium rental for a sublease or lump sum payment for an assignment, but excluding Tenant's reasonable costs in marketing and subleasing the Premises) in excess of the rental and other charges due to Landlord under this Lease, Tenant shall pay fifty percent (50%) of all of such excess to Landlord, after making deductions for any reasonable marketing expenses, tenant improvement funds expended by Tenant, alterations, cash concessions, brokerage commissions, attorneys' fees and free rent actually paid by Tenant. If such consideration consists of cash paid to Tenant, payment to Landlord shall be made upon receipt by Tenant of such cash payment;

(f) The proposed transferee, assignee or sublessee shall agree that, in the event Landlord gives such proposed transferee, assignee or sublessee notice that Tenant is in default under this Lease, such proposed transferee, assignee or sublessee shall thereafter make all

payments otherwise due Tenant directly to Landlord, which payments shall be received by Landlord without any liability being incurred by Landlord, except to credit such payment against those due by Tenant under this Lease, and any such proposed transferee, assignee or sublessee shall agree to attorn to Landlord or its successors and assigns should this Lease be terminated for any reason; provided, however, that in no event shall Landlord or its Lenders, successors or assigns be obligated to accept such attornment;

(g) Landlord's consent to any such Transfer shall be effected on Landlord's forms;

(h) Tenant shall not then be in default hereunder in any respect;

(i) Such proposed transferee, assignee or sublessee's use of the Premises shall be the same as the Permitted Use; (j) Landlord shall not be bound by any provision of any agreement pertaining to the Transfer, except for Landlord's written consent to the same;

(k) Tenant shall pay all transfer and other taxes (including interest and penalties) assessed or payable for any Transfer;

(l) Landlord's consent (or waiver of its rights) for any Transfer shall not waive Landlord's right to consent or refuse consent to any later Transfer;

(m) Tenant shall deliver to Landlord one executed copy of any and all written instruments evidencing or relating to the Transfer; and

(n) Tenant shall deliver to Landlord a list of Hazardous Materials (as defined below), certified by the proposed transferee, assignee or sublessee to be true and correct, that the proposed transferee, assignee or sublessee intends to use or store in the Premises. Additionally, Tenant shall deliver to Landlord, on or before the date any proposed transferee, assignee or sublessee takes occupancy of the Premises, all of the items relating to Hazardous Materials of such proposed transferee, assignee or sublessee as described in Section 21.2.

29.5. Any Transfer that is not in compliance with the provisions of this Article or with respect to which Tenant does not fulfill its obligations pursuant to this Article shall be void and shall, at the option of Landlord, terminate this Lease.

29.6. Notwithstanding any Transfer, Tenant shall remain fully and primarily liable for the payment of all Rent and other sums due or to become due hereunder, and for the full performance of all other terms, conditions and covenants to be kept and performed by Tenant. The acceptance of Rent or any other sum due hereunder, or the acceptance of performance of any other term, covenant or condition thereof, from any person or entity other than Tenant shall not be deemed a waiver of any of the provisions of this Lease or a consent to any Transfer.

29.7. If Tenant delivers to Landlord a Transfer Notice indicating a desire to assign this Lease (other than pursuant to an Exempt Transfer) or (a) sublet more than sixty percent (60%) of the Rentable Area of the Premises (either in a single sublease or in the aggregate) (other than

pursuant to Exempt Transfers that are not Transfers to Atlas Companies) or (b) sublet more than fifty percent (50%) of the Premises for the remainder of the Term of this Lease (other than pursuant to Exempt Transfers that are not Transfer to Atlas Companies), then Landlord shall have the option, exercisable by giving notice to Tenant at any time within ten (10) days after Landlord's receipt of such Transfer Notice, to terminate this Lease as of the date specified in the Transfer Notice as the Transfer Date, except for those provisions that, by their express terms, survive the expiration or earlier termination hereof. If Landlord exercises such option, then Tenant shall have the right to withdraw such Transfer Notice by delivering to Landlord written notice of such election within five (5) days after Landlord's delivery of notice electing to exercise Landlord's option to terminate this Lease. In the event Tenant withdraws the Transfer Notice as provided in this Section, this Lease shall continue in full force and effect. No failure of Landlord to exercise its option to terminate this Lease shall be deemed to be Landlord's consent to a proposed Transfer.

29.8. If Tenant sublets the Premises or any portion thereof, Tenant hereby immediately and irrevocably assigns to Landlord, as security for Tenant's obligations under this Lease, all rent from any such subletting, and Landlord (or a receiver for Tenant appointed on Landlord's application) may collect such rent and apply it toward Tenant's obligations under this Lease; provided that, until the occurrence of a Default (as defined below) by Tenant, Tenant shall have the right to collect such rent. The terms of this Section 29.8 are self-operative, however, if Tenant fails to confirm Landlord's rights under this Section 29.8 in writing within five (5) business days after written notice from Landlord, Tenant hereby appoints Landlord as assignee and attorney-in-fact for Tenant to collect and apply any such rents in accordance with this Section 29.8. Tenant acknowledges and agrees that notwithstanding anything in this Lease to the contrary and with respect to the immediately foregoing sentence it shall not be entitled to any other cure period as may be specified in this Lease other than the 5-business day cure period specified in this Section 29.8.

29.9. In the event that Tenant enters into a sublease for the entire Premises in accordance with this Article that expires within two (2) days of the Term Expiration Date, the term expiration date of such sublease shall, notwithstanding anything in this Lease, the sublease or any consent to the sublease to the contrary, be deemed to be the date that is two (2) days prior to the Term Expiration Date.

30. Subordination and Attornment.

30.1. This Lease shall be subject and subordinate to the lien of any mortgage, deed of trust, or lease in which Landlord is tenant now or hereafter in force against the Building or the Project and to all advances made or hereafter to be made upon the security thereof without the necessity of the execution and delivery of any further instruments on the part of Tenant to effectuate such subordination.

30.2. Notwithstanding the foregoing, Tenant shall execute and deliver upon demand such further instrument or instruments evidencing such subordination of this Lease to the lien of any such mortgage or mortgages or deeds of trust or lease in which Landlord is tenant as may be required by Landlord. If any such mortgagee, beneficiary or landlord under a lease wherein Landlord is tenant (each, a "Mortgagee") so elects, however, this Lease shall be deemed prior in lien to any such lease, mortgage, or deed of trust upon or including the Premises regardless of

date and Tenant shall execute a statement in writing to such effect at Landlord's request. If Tenant fails to execute any document required from Tenant under this Section within ten (10) days after written request therefor, Tenant hereby constitutes and appoints Landlord or its special attorney-in-fact to execute and deliver any such document or documents in the name of Tenant. Such power is coupled with an interest and is irrevocable. For the avoidance of doubt, "Mortgagees" shall also include historic tax credit investors and new market tax credit investors.

30.3. Upon written request of Landlord and opportunity for Tenant to review, Tenant agrees to execute any Lease amendments not materially altering the terms of this Lease, if required by a Mortgagee incident to the financing of the real property of which the Premises constitute a part.

30.4. In the event any proceedings are brought for foreclosure, or in the event of the exercise of the power of sale under any mortgage or deed of trust made by Landlord covering the Premises, Tenant shall at the election of the purchaser at such foreclosure or sale attorn to the purchaser upon any such foreclosure or sale and recognize such purchaser as Landlord under this Lease.

31. Defaults and Remedies.

31.1. Late payment by Tenant to Landlord of Rent and other sums due shall cause Landlord to incur costs not contemplated by this Lease, the exact amount of which shall be extremely difficult and impracticable to ascertain. Such costs include processing and accounting charges and late charges that may be imposed on Landlord by the terms of any mortgage or trust deed covering the Premises. Therefore, if any installment of Rent due from Tenant is not received by Landlord within three (3) days after the date such payment is due, Tenant shall pay to Landlord (a) an additional sum of six percent (6%) of the overdue Rent as a late charge plus (b) interest at an annual rate (the "Default Rate") equal to the lesser of (a) twelve percent (12%) and (b) the highest rate permitted by Applicable Laws. The parties agree that this late charge represents a fair and reasonable estimate of the costs that Landlord shall incur by reason of late payment by Tenant and shall be payable as Additional Rent to Landlord due with the next installment of Rent or within five (5) business days after Landlord's demand, whichever is earlier. Landlord's acceptance of any Additional Rent (including a late charge or any other amount hereunder) shall not be deemed an extension of the date that Rent is due or prevent Landlord from pursuing any other rights or remedies under this Lease, at law or in equity.

31.2. No payment by Tenant or receipt by Landlord of a lesser amount than the Rent payment herein stipulated shall be deemed to be other than on account of the Rent, nor shall any endorsement or statement on any check or any letter accompanying any check or payment as Rent be deemed an accord and satisfaction, and Landlord may accept such check or payment without prejudice to Landlord's right to recover the balance of such Rent or pursue any other remedy provided in this Lease or in equity or at law. If a dispute shall arise as to any amount or sum of money to be paid by Tenant to Landlord hereunder, Tenant shall have the right to make payment "under protest," such payment shall not be regarded as a voluntary payment, and there shall survive the right on the part of Tenant to institute suit for recovery of the payment paid under protest.

31.3. If Tenant fails to pay any sum of money required to be paid by it hereunder or perform any other act on its part to be performed hereunder, in each case within the applicable cure period (if any) described in Section 31.4, then Landlord may (but shall not be obligated to), without waiving or releasing Tenant from any obligations of Tenant, make such payment or perform such act; provided that such failure by Tenant unreasonably interfered with the use of the Building or the Project by any other tenant or with the efficient operation of the Building or the Project, or resulted or could have resulted in a violation of Applicable Laws or the cancellation of an insurance policy maintained by Landlord. Notwithstanding the foregoing, in the event of an emergency, Landlord shall have the right to enter the Premises and act in accordance with its rights as provided elsewhere in this Lease. In addition to the late charge described in Section 31.1, Tenant shall pay to Landlord as Additional Rent all sums so paid or incurred by Landlord, together with interest at the Default Rate, computed from the date such sums were paid or incurred.

31.4. The occurrence of any one or more of the following events shall constitute a "Default" hereunder by Tenant:

(a) Tenant abandons or vacates the Premises;

(b) Tenant fails to make any payment of Rent, as and when due, or to satisfy its obligations under Article 19, where such failure shall continue for a period of three (3) business days after written notice thereof from Landlord to Tenant;

(c) Tenant fails to observe or perform any obligation or covenant contained herein (other than described in Sections 31.4(a) and 31.4(b)) to be performed by Tenant, where such failure continues for a period of thirty (30) days after written notice thereof from Landlord to Tenant; provided that, if the nature of Tenant's default is such that it reasonably requires more than thirty (30) days to cure, Tenant shall not be deemed to be in Default if Tenant commences such cure within such thirty (30) day period and thereafter diligently prosecutes the same to completion; and provided, further, that such cure is completed no later than thirty (30) days after Tenant's receipt of written notice from Landlord;

(d) Tenant makes an assignment for the benefit of creditors;

(e) A receiver, trustee or custodian is appointed to or does take title, possession or control of all or substantially all of Tenant's assets;

(f) Tenant files a voluntary petition under the United States Bankruptcy Code or any successor statute (as the same may be amended from time to time, the "Bankruptcy Code") or an order for relief is entered against Tenant pursuant to a voluntary or involuntary proceeding commenced under any chapter of the Bankruptcy Code;

(g) Any involuntary petition is filed against Tenant under any chapter of the Bankruptcy Code and is not dismissed within one hundred twenty (120) days;

(h) Tenant fails to deliver an estoppel certificate in accordance with Article 20; or

(i) Tenant's interest in this Lease is attached, executed upon or otherwise judicially seized and such action is not released within one hundred twenty (120) days of the action.

Notices given under this Section shall specify the alleged default and shall demand that Tenant perform the provisions of this Lease or pay the Rent that is in arrears, as the case may be, within the applicable period of time, or quit the Premises. No such notice shall be deemed a forfeiture or a termination of this Lease unless Landlord elects otherwise in such notice.

31.5. In the event of a Default by Tenant, and at any time thereafter, with or without notice or demand and without limiting Landlord in the exercise of any right or remedy that Landlord may have, Landlord has the right to do any or all of the following:

(a) Halt any Alterations and order Tenant's contractors, subcontractors, consultants, designers and material suppliers to stop work;

(b) Terminate Tenant's right to possession of the Premises by written notice to Tenant or by any lawful means, in which case Tenant shall immediately surrender possession of the Premises to Landlord. In such event, Landlord shall have the immediate right to re-enter and remove all persons and property, and such property may be removed and stored in a public warehouse or elsewhere at the cost and for the account of Tenant, all without service of notice or resort to legal process and without being deemed guilty of trespass or becoming liable for any loss or damage that may be occasioned thereby; and

(c) Terminate this Lease, in which event Tenant shall immediately surrender possession of the Premises to Landlord. In such event, Landlord shall have the immediate right to re-enter and remove all persons and property, and such property may be removed and stored in a public warehouse or elsewhere at the cost and for the account of Tenant, all without service of notice or resort to legal process and without being deemed guilty of trespass or becoming liable for any loss or damage that may be occasioned thereby. In the event that Landlord shall elect to so terminate this Lease, then Landlord shall be entitled to recover from Tenant all damages incurred by Landlord by reason of Tenant's default, including The sum of:

(i) The worth at the time of award of any unpaid Rent that had accrued at the time of such termination; plus

(ii) The costs of restoring the Premises to the condition required under the terms of this Lease; plus

(iii) An amount (the "Election Amount") equal to either (A) the positive difference (if any, and measured at the time of such termination) between (1) the then-present value of the total Rent and other benefits that would have accrued to Landlord under this Lease for the remainder of the Term if Tenant had fully complied with the Lease minus (2) the then-present cash rental value of the Premises as determined by Landlord for what would be the then-unexpired Term if the Lease remained in effect, computed using the discount rate of the Federal Reserve Bank of San Francisco at the time of the award plus one (1) percentage point (the "Discount Rate") or (B) twelve (12) months (or such lesser number of months as may then be remaining in the Term) of Base Rent and Additional Rent at the rate last payable by Tenant

pursuant to this Lease, in either case as Landlord specifies in such election. Landlord and Tenant agree that the Election Amount represents a reasonable forecast of the minimum damages expected to occur in the event of a breach, taking into account the uncertainty, time and cost of determining elements relevant to actual damages, such as fair market rent, time and costs that may be required to re-lease the Premises, and other factors; and that the Election Amount is not a penalty.

As used in Section 31.5(c)(i), "worth at the time of award" shall be computed by allowing interest at the Default Rate.

31.6. In addition to any other remedies available to Landlord at law or in equity and under this Lease, Landlord may continue this Lease in effect after Tenant's Default or abandonment and recover Rent as it becomes due. In addition, Landlord shall not be liable in any way whatsoever for its failure or refusal to relet the Premises. For purposes of this Section, the following acts by Landlord will not constitute the termination of Tenant's right to possession of the Premises:

(a) Acts of maintenance or preservation or efforts to relet the Premises, including alterations, remodeling, redecorating, repairs, replacements or painting as Landlord shall consider advisable for the purpose of reletting the Premises or any part thereof; or

(b) The appointment of a receiver upon the initiative of Landlord to protect Landlord's interest under this Lease or in the Premises.

Notwithstanding the foregoing, in the event of a Default by Tenant, Landlord may elect at any time to terminate this Lease and to recover damages to which Landlord is entitled.

31.7. If Landlord does not elect to terminate this Lease as provided in Section 31.5, then Landlord may, from time to time, recover all Rent as it becomes due under this Lease. At any time thereafter, Landlord may elect to terminate this Lease and to recover damages to which Landlord is entitled.

31.8. In the event Landlord elects to terminate this Lease and relet the Premises, Landlord may execute any new lease in its own name. Tenant hereunder shall have no right or authority whatsoever to collect any Rent from such tenant. The proceeds of any such reletting shall be applied as follows:

(a) First, to the payment of any indebtedness other than Rent due hereunder from Tenant to Landlord, including storage charges or brokerage commissions owing from Tenant to Landlord as the result of such reletting;

(b) Second, to the payment of the costs and expenses of reletting the Premises, including (i) alterations and repairs that Landlord deems reasonably necessary and advisable and (ii) reasonable attorneys' fees, charges and disbursements incurred by Landlord in connection with the retaking of the Premises and such reletting;

(c) Third, to the payment of Rent and other charges due and unpaid hereunder; and

(d) Fourth, to the payment of future Rent and other damages payable by Tenant under this Lease.

31.9. All of Landlord's rights, options and remedies hereunder shall be construed and held to be nonexclusive and cumulative. Landlord shall have the right to pursue any one or all of such remedies, or any other remedy or relief that may be provided by Applicable Laws, whether or not stated in this Lease. No waiver of any default of Tenant hereunder shall be implied from any acceptance by Landlord of any Rent or other payments due hereunder or any omission by Landlord to take any action on account of such default if such default persists or is repeated, and no express waiver shall affect defaults other than as specified in such waiver. Notwithstanding any provision of this Lease to the contrary, in no event shall Landlord be required to mitigate its damages with respect to any default by Tenant, except as required by Applicable Laws. Any such obligation imposed by Applicable Laws upon Landlord to relet the Premises after any termination of this Lease shall be subject to the reasonable requirements of Landlord to (a) lease to high quality tenants on such terms as Landlord may from time to time deem appropriate in its discretion and (b) develop the Project in a harmonious manner with a mix of uses, tenants, floor areas, terms of tenancies, etc., as determined by Landlord. Landlord shall not be obligated to relet the Premises to (y) any Tenant's Affiliate or (z) any party (i) unacceptable to a Lender, (ii) that requires Landlord to make improvements to or re-demise the Premises, (iii) that desires to change the Permitted Use, (iv) that desires to lease the Premises for more or less than the remaining Term or (v) to whom Landlord or an affiliate of Landlord may desire to lease other available space in the Project or at another property owned by Landlord or an affiliate of Landlord.

31.10. Landlord's termination of (a) this Lease or (b) Tenant's right to possession of the Premises shall not relieve Tenant of any liability to Landlord that has previously accrued or that shall arise based upon events that occurred prior to the later to occur of (y) the date of Lease termination and (z) the date Tenant surrenders possession of the Premises.

31.11. To the extent permitted by Applicable Laws, Tenant waives any and all rights of redemption granted by or under any present or future Applicable Laws if Tenant is evicted or dispossessed for any cause, or if Landlord obtains possession of the Premises due to Tenant's default hereunder or otherwise.

31.12. Landlord shall not be in default or liable for damages under this Lease unless Landlord fails to perform obligations required of Landlord within a reasonable time, but in no event shall such failure continue for more than thirty (30) days after written notice from Tenant specifying the nature of Landlord's failure; provided, however, that if the nature of Landlord's obligation is such that more than thirty (30) days are required for its performance, then Landlord shall not be in default if Landlord commences performance within such thirty (30) day period and thereafter diligently prosecutes the same to completion. In no event shall Tenant have the right to terminate or cancel this Lease or to withhold or abate rent or to set off any Claims against Rent as a result of any default or breach by Landlord of any of its covenants, obligations, representations, warranties or promises hereunder, except as may otherwise be expressly set forth in this Lease.

31.13. In the event of any default by Landlord, Tenant shall give notice by registered or certified mail to any (a) beneficiary of a deed of trust or (b) mortgagee under a mortgage covering the Premises, the Building or the Project and to any landlord of any lease of land upon or within which the Premises, the Building or the Project is located, and shall offer such beneficiary, mortgagee or landlord a reasonable opportunity to cure the default, including time to obtain possession of the Building or the Project by power of sale or a judicial action if such should prove necessary to effect a cure; provided that Landlord shall furnish to Tenant in writing, upon written request by Tenant, the names and addresses of all such persons who are to receive such notices.

32. Bankruptcy . In the event a debtor, trustee or debtor in possession under the Bankruptcy Code, or another person with similar rights, duties and powers under any other Applicable Laws, proposes to cure any default under this Lease or to assume or assign this Lease and is obliged to provide adequate assurance to Landlord that (a) a default shall be cured, (b) Landlord shall be compensated for its damages arising from any breach of this Lease and (c) future performance of Tenant's obligations under this Lease shall occur, then such adequate assurances shall include any or all of the following, as designated by Landlord in its sole and absolute discretion:

32.1. Those acts specified in the Bankruptcy Code or other Applicable Laws as included within the meaning of "adequate assurance," even if this Lease does not concern a shopping center or other facility described in such Applicable Laws;

32.2. A prompt cash payment to compensate Landlord for any monetary defaults or actual damages arising directly from a breach of this Lease;

32.3. A cash deposit in an amount at least equal to the then-current amount of the Security Deposit; or

32.4. The assumption or assignment of all of Tenant's interest and obligations under this Lease.

33. Brokers.

33.1. Tenant represents and warrants that it has had no dealings with any real estate broker or agent in connection with the negotiation of this Lease other than Newmark Grubb Knight Frank and Transwestern I RBJ (collectively, "Broker"), and that it knows of no other real estate broker or agent that is or might be entitled to a commission in connection with this Lease. Landlord shall compensate Broker in relation to this Lease pursuant to a separate agreement between Landlord and Broker.

33.2. Tenant represents and warrants that no broker or agent has made any representation or warranty relied upon by Tenant in Tenant's decision to enter into this Lease, other than as contained in this Lease.

33.3. Tenant acknowledges and agrees that the employment of brokers by Landlord is for the purpose of solicitation of offers of leases from prospective tenants and that no authority is granted to any broker to furnish any representation (written or oral) or warranty from Landlord unless expressly contained within this Lease. Landlord is executing this Lease in reliance upon Tenant's representations, warranties and agreements contained within Sections 33.1 and 33.2.

33.4. Tenant agrees to indemnify, save, defend (at Landlord's option and with counsel reasonably acceptable to Landlord) and hold the Landlord Indemnitees harmless from any and all cost or liability for compensation claimed by any broker or agent, other than Broker, employed or engaged by Tenant or claiming to have been employed or engaged by Tenant.

34. Definition of Landlord. With regard to obligations imposed upon Landlord pursuant to this Lease, the term "Landlord," as used in this Lease, shall refer only to Landlord or Landlord's then-current successor-in-interest. In the event of any transfer, assignment or conveyance of Landlord's interest in this Lease or in Landlord's fee title to or leasehold interest in the Property, as applicable, Landlord herein named (and in case of any subsequent transfers or conveyances, the subsequent Landlord) shall be automatically freed and relieved, from and after the date of such transfer, assignment or conveyance, from all liability for the performance of any covenants or obligations contained in this Lease thereafter to be performed by Landlord and, without further agreement, the transferee, assignee or conveyee of Landlord's in this Lease or in Landlord's fee title to or leasehold interest in the Property, as applicable, shall be deemed to have assumed and agreed to observe and perform any and all covenants and obligations of Landlord hereunder during the tenure of its interest in the Lease or the Property. Landlord or any subsequent Landlord may transfer its interest in the Premises or this Lease without Tenant's consent.

35. Limitation of Landlord's Liability.

35.1. If Landlord is in default under this Lease and, as a consequence, Tenant recovers a monetary judgment against Landlord, the judgment shall be satisfied only out of (a) the proceeds of sale received on execution of the judgment and levy against the right, title and interest of Landlord in the Building and the Project, (b) rent or other income from such real property receivable by Landlord or (c) the consideration received by Landlord from the sale, financing, refinancing or other disposition of all or any part of Landlord's right, title or interest in the Building or the Project.

35.2. Neither Landlord nor any of its affiliates, nor any of their respective partners, shareholders, directors, officers, employees, members or agents shall be personally liable for Landlord's obligations or any deficiency under this Lease, and service of process shall not be made against any shareholder, director, officer, employee or agent of Landlord or any of Landlord's affiliates. No partner, shareholder, director, officer, employee, member or agent of Landlord or any of its affiliates shall be sued or named as a party in any suit or action, and service of process shall not be made against any partner or member of Landlord except as may be necessary to secure jurisdiction of the partnership, joint venture or limited liability company, as applicable. No partner, shareholder, director, officer, employee, member or agent of Landlord or any of its affiliates shall be required to answer or otherwise plead to any service of process, and no judgment shall be taken or writ of execution levied against any partner, shareholder, director, officer, employee, member or agent of Landlord or any of its affiliates.

35.3. Each of the covenants and agreements of this Article shall be applicable to any covenant or agreement either expressly contained in this Lease or imposed by Applicable Laws and shall survive the expiration or earlier termination of this Lease.

36. Joint and Several Obligations. If more than one person or entity executes this Lease as Tenant, then:

36.1. Each of them is jointly and severally liable for the keeping, observing and performing of all of the terms, covenants, conditions, provisions and agreements of this Lease to be kept, observed or performed by Tenant, and such terms, covenants, conditions, provisions and agreements shall be binding with the same force and effect upon each and all of the persons executing this Agreement as Tenant; and

36.2. The term "Tenant," as used in this Lease, shall mean and include each of them, jointly and severally. The act of, notice from, notice to, refund to, or signature of any one or more of them with respect to the tenancy under this Lease, including any renewal, extension, expiration, termination or modification of this Lease, shall be binding upon each and all of the persons executing this Lease as Tenant with the same force and effect as if each and all of them had so acted, so given or received such notice or refund, or so signed.

37. Representations. Tenant guarantees, warrants and represents that (a) Tenant is duly incorporated or otherwise established or formed and validly existing under the laws of its state of incorporation, establishment or formation, (b) Tenant has and is duly qualified to do business in the state in which the Property is located, (c) Tenant has full corporate, partnership, trust, association or other appropriate power and authority to enter into this Lease and to perform all Tenant's obligations hereunder, (d) each person (and all of the persons if more than one signs) signing this Lease on behalf of Tenant is duly and validly authorized to do so and (e) neither (i) the execution, delivery or performance of this Lease nor (ii) the consummation of the transactions contemplated hereby will violate or conflict with any provision of documents or instruments under which Tenant is constituted or to which Tenant is a party. In addition, Tenant guarantees, warrants and represents that none of (x) it, (y) its affiliates or partners nor (z) to the best of its knowledge, its members, shareholders or other equity owners or any of their respective employees, officers, directors, representatives or agents is a person or entity with whom U.S. persons or entities are restricted from doing business under regulations of the Office of Foreign Asset Control ("OFAC") of the Department of the Treasury (including those named on OFAC's Specially Designated and Blocked Persons List) or under any statute, executive order (including the September 24, 2001, Executive Order Blocking Property and Prohibiting Transactions with Persons Who Commit, Threaten to Commit, or Support Terrorism) or other similar governmental action.

38. Confidentiality. Tenant shall keep the terms and conditions of this Lease and any information provided to Tenant or its employees, agents or contractors pursuant to Article 9 confidential and shall not (a) disclose to any third party any terms or conditions of this Lease or any other Lease-related document (including subleases, assignments, work letters, construction contracts, letters of credit, subordination agreements, non-disturbance agreements, brokerage agreements or estoppels) or (b) provide to any third party an original or copy of this Lease (or any Lease-related document). Landlord shall not release to any third party any non-public

financial information or non-public information about Tenant's ownership structure that Tenant gives Landlord. Notwithstanding the foregoing, confidential information under this Section may be released by Landlord or Tenant under the following circumstances: (x) if required by Applicable Laws or in any judicial proceeding; provided that the releasing party has given the other party reasonable notice of such requirement, if feasible, (y) to a party's attorneys, accountants, brokers and other bona fide consultants or advisers, investors, potential investors and potential business combination partners (with respect to this Lease only); provided such third parties agree to be bound by this Section or (z) to bona fide prospective assignees or subtenants of this Lease; provided they agree in writing to be bound by this Section.

39. Notices . Except as otherwise stated in this Lease, any notice, consent, demand, invoice, statement or other communication required or permitted to be given hereunder shall be in writing and shall be given by (a) personal delivery, (b) overnight delivery with a reputable international overnight delivery service, such as FedEx, or (c) facsimile or email transmission, so long as such transmission is followed within one (1) business day by delivery utilizing one of the methods described in Subsection 39(a) or (b). Any such notice, consent, demand, invoice, statement or other communication shall be deemed delivered (x) upon receipt, if given in accordance with Subsection 39(a); (y) one (1) business day after deposit with a reputable international overnight delivery service, if given if given in accordance with Subsection 39(b); or (z) upon transmission, if given in accordance with Subsection 39(c). Except as otherwise stated in this Lease, any notice, consent, demand, invoice, statement or other communication required or permitted to be given pursuant to this Lease shall be addressed to Tenant at the Premises, or to Landlord or Tenant at the addresses shown in Sections 2.9 and 2.10 or 2.11, respectively. Either party may, by notice to the other given pursuant to this Section, specify additional or different addresses for notice purposes.

40. Miscellaneous.

40.1. Landlord reserves the right to change the name of the Building or the Project in its sole discretion.

40.2. To induce Landlord to enter into this Lease, Tenant agrees that it shall furnish to Landlord, from time to time, within ten (10) business days after receipt of Landlord's written request, the most recent year-end unconsolidated balance sheet, profit and loss statement, and statement of cash flow of Tenant reflecting Tenant's financial condition audited by a nationally recognized accounting firm; provided that Tenant shall not be required to provide said statements more than one (1) time per year unless Tenant's balance sheet, profit and loss statement, or statement of cash flow are restated or amended, in which case Tenant shall, within ten (10) business days after such restatement or amendment, deliver the restated balance sheet, profit and loss statement, or statement of cash flow, as the case may be, of Tenant to Landlord. Tenant shall, within ninety (90) days after the end of Tenant's financial year, furnish Landlord with a certified copy of Tenant's year-end unconsolidated balance sheet, profit and loss statement, and statement of cash flow of Tenant for the previous year audited by a nationally recognized accounting firm, and Tenant shall, if Tenant's balance sheet, profit and loss statement, or statement of cash flow of Tenant are subsequently restated or amended, deliver the restated balance sheet, profit and loss statement, or statement of cash flow, as the case may be, to Landlord within ten (10) business days after such restatement or amendment. Tenant represents

and warrants that all balance sheets, profit and loss statements, and statements of cash flow, records and information furnished by Tenant to Landlord in connection with this Lease are true, correct and complete in all respects. If an audited balance sheet, profit and loss statement, and statement of cash flow are not otherwise prepared, an unaudited balance sheet, profit and loss statement, and statement of cash flow complying with generally accepted accounting principles and certified by the chief financial officer, or an employee of Tenant with a similar position if there is no chief financial officer, of Tenant as true, correct and complete in all respects shall suffice for purposes of this Section. If Tenant fails to deliver to Landlord any financial statement within the time period required under this Section, then Tenant shall be required to pay to Landlord an administrative fee equal to Five Hundred Dollars ($500) within five (5) business days after receiving written notice from Landlord advising Tenant of such failure (provided, however, that Landlord's acceptance of such fee shall not prevent Landlord from pursuing any other rights or remedies under this Lease, at law or in equity). The provisions of this Section shall not apply at any time while Tenant is a corporation whose shares are traded on any nationally recognized stock exchange.

40.3. Submission of this instrument for examination or signature by Tenant does not constitute a reservation of or option for a lease, and shall not be effective as a lease or otherwise until execution by and delivery to both Landlord and Tenant.

40.4. The terms of this Lease are intended by the parties as a final, complete and exclusive expression of their agreement with respect to the terms that are included herein, and may not be contradicted or supplemented by evidence of any other prior or contemporaneous agreement.

40.5. Upon the request of either Landlord or Tenant, the parties shall execute a document in recordable form containing only such information as is necessary to constitute a Notice of Lease under Massachusetts law. All costs of preparing and recording such notice shall be borne by the requesting party. Within ten (10) days after receipt of written request from Landlord after the expiration or earlier termination of this Lease, Tenant shall execute a termination of any Notice of Lease recorded with respect hereto. Neither party shall record this Lease.

40.6. Where applicable in this Lease, the singular includes the plural and the masculine or neuter includes the masculine, feminine and neuter. The words "include," "includes," "included" and "including" mean "'include,' etc., without limitation." The word "shall" is mandatory and the word "may" is permissive. The section headings of this Lease are not a part of this Lease and shall have no effect upon the construction or interpretation of any part of this Lease. Landlord and Tenant have each participated in the drafting and negotiation of this Lease, and the language in all parts of this Lease shall be in all cases construed as a whole according to its fair meaning and not strictly for or against either Landlord or Tenant.

40.7. Except as otherwise expressly set forth in this Lease, each party shall pay its own costs and expenses incurred in connection with this Lease and such party's performance under this Lease; provided that, if either party commences an action, proceeding, demand, claim, action, cause of action or suit against the other party arising out of or in connection with this Lease, then the substantially prevailing party shall be reimbursed by the other party for all

reasonable costs and expenses, including reasonable attorneys' fees and expenses, incurred by the substantially prevailing party in such action, proceeding, demand, claim, action, cause of action or suit, and in any appeal in connection therewith (regardless of whether the applicable action, proceeding, demand, claim, action, cause of action, suit or appeal is voluntarily withdrawn or dismissed).

40.8. Time is of the essence with respect to the performance of every provision of this Lease.

40.9. Each provision of this Lease performable by Tenant shall be deemed both a covenant and a condition.

40.10. Notwithstanding anything to the contrary contained in this Lease, Tenant's obligations under this Lease are independent and shall not be conditioned upon performance by Landlord.

40.11. Whenever consent or approval of either party is required, that party shall not unreasonably withhold, condition or delay such consent or approval, except as may be expressly set forth to the contrary.

40.12. Any provision of this Lease that shall prove to be invalid, void or illegal shall in no way affect, impair or invalidate any other provision hereof, and all other provisions of this Lease shall remain in full force and effect and shall be interpreted as if the invalid, void or illegal provision did not exist.

40.13. Each of the covenants, conditions and agreements herein contained shall inure to the benefit of and shall apply to and be binding upon the parties hereto and their respective heirs; legatees; devisees; executors; administrators; and permitted successors and assigns. This Lease is for the sole benefit of the parties and their respective heirs, legatees, devisees, executors, administrators and permitted successors and assigns, and nothing in this Lease shall give or be construed to give any other person or entity any legal or equitable rights. Nothing in this Section shall in any way alter the provisions of this Lease restricting assignment or subletting.

40.14. This Lease shall be governed by, construed and enforced in accordance with the laws of the state in which the Premises are located, without regard to such state's conflict of law principles.

40.15. Tenant guarantees, warrants and represents that the individual or individuals signing this Lease have the power, authority and legal capacity to sign this Lease on behalf of and to bind all entities, corporations, partnerships, limited liability companies, joint venturers or other organizations and entities on whose behalf such individual or individuals have signed.

40.16. This Lease may be executed in one or more counterparts, each of which, when taken together, shall constitute one and the same document.

40.17. No provision of this Lease may be modified, amended or supplemented except by an agreement in writing signed by Landlord and Tenant.

40.18. No waiver of any term, covenant or condition of this Lease shall be binding upon Landlord unless executed in writing by Landlord. The waiver by Landlord of any breach or default of any term, covenant or condition contained in this Lease shall not be deemed to be a waiver of any preceding or subsequent breach or default of such term, covenant or condition or any other term, covenant or condition of this Lease.

40.19. To the extent permitted by Applicable Laws, the parties waive trial by jury in any action, proceeding or counterclaim brought by the other party hereto related to matters arising out of or in any way connected with this Lease; the relationship between Landlord and Tenant; Tenant's use or occupancy of the Premises; or any claim of injury or damage related to this Lease or the Premises.

41. Rooftop Installation Area.

41.1. Tenant may use the portion of the Building identified as a "Rooftop Allocation Areas" on Exhibit A attached hereto (the "Rooftop Installation Area") solely to operate, maintain, repair and replace rooftop antennae, mechanical equipment, communications antennas and other equipment installed by Tenant in the Rooftop Installation Area in accordance with this Article ("Tenant's Rooftop Equipment"). Tenant's Rooftop Equipment shall be only for Tenant's use of the Premises for the Permitted Use.

41.2. Tenant shall install Tenant's Rooftop Equipment at its sole cost and expense, at such times and in such manner as Landlord may reasonably designate, and in accordance with this Article and the applicable provisions of this Lease regarding Alterations. Tenant's Rooftop Equipment and the installation thereof shall be subject to Landlord's prior written approval, which approval shall not be unreasonably withheld. Among other reasons, Landlord may withhold approval if the installation or operation of Tenant's Rooftop Equipment could reasonably be expected to damage the structural integrity of the Building or to transmit vibrations or noise or cause other adverse effects beyond the Premises to an extent not customary in first class laboratory buildings, unless Tenant implements measures that are acceptable to Landlord in its reasonable discretion to avoid any such damage or transmission.

41.3. Tenant shall comply with any roof or roof-related warranties. Tenant shall obtain a letter from Landlord's roofing contractor within thirty (30) days after completion of any Tenant work on the rooftop stating that such work did not affect any such warranties. Tenant, at its sole cost and expense, shall inspect the Rooftop Installation Area at least annually, and correct any loose bolts, fittings or other appurtenances and repair any damage to the roof caused by the installation or operation of Tenant's Rooftop Equipment. Tenant shall not permit the installation, maintenance or operation of Tenant's Rooftop Equipment to violate any Applicable Laws, including any applicable noise ordinances, or constitute a nuisance. Tenant shall pay Landlord within thirty (30) days after demand (a) all applicable taxes, charges, fees or impositions imposed on Landlord by Governmental Authorities as the result of Tenant's use of the Rooftop Installation Areas in excess of those for which Landlord would otherwise be responsible for the use or installation of Tenant's Rooftop Equipment and (b) the amount of any increase in Landlord's insurance premiums as a result of the installation of Tenant's Rooftop Equipment. Upon Tenant's written request to Landlord, Landlord shall use commercially reasonable efforts to cause other tenants to remedy any interference in the operation of Tenant's Rooftop Equipment caused by any such tenants' equipment installed after the applicable piece of Tenant's Rooftop Equipment; provided, however, that Landlord shall not be required to request that such tenants waive their rights under their respective leases.

41.4. If Tenant's Equipment (a) causes physical damage to the structural integrity of the Building, (b) interferes with any telecommunications, mechanical or other systems located at or near or servicing the Building or the Project that were installed prior to the installation of Tenant's Rooftop Equipment, (c) interferes with any other service provided to other tenants in the Building or the Project by rooftop or penthouse installations that were installed prior to the installation of Tenant's Rooftop Equipment or (d) interferes with any other tenants' business, in each case in excess of that permissible under Federal Communications Commission regulations, then Tenant shall cooperate with Landlord to determine the source of the damage or interference and promptly repair such damage and eliminate such interference, in each case at Tenant's sole cost and expense, within ten (10) days after receipt of notice of such damage or interference (which notice may be oral; provided that Landlord also delivers to Tenant written notice of such damage or interference within twenty-four (24) hours after providing oral notice).

41.5. Landlord reserves the right to cause Tenant to relocate Tenant's Rooftop Equipment to comparably functional space on the roof or in the penthouse of the Building by giving Tenant prior written notice thereof. Landlord agrees to pay the reasonable costs thereof. Tenant shall arrange for the relocation of Tenant's Rooftop Equipment within sixty (60) days after receipt of Landlord's notification of such relocation. In the event Tenant fails to arrange for relocation within such sixty (60)-day period, Landlord shall have the right to arrange for the relocation of Tenant's Rooftop Equipment in a manner that does not unnecessarily interrupt or interfere with Tenant's use of the Premises for the Permitted Use.

42. Option to Extend Term. Tenant shall have the option ("Option") to extend the Term by five (5) years as to the entire Premises (and no less than the entire Premises) upon the following terms and conditions. Any extension of the Term pursuant to the Option shall be on all the same terms and conditions as this Lease, except as follows:

42.1. Base Rent at the commencement of the Option term shall equal the greater of (a) one hundred percent (100%) of the then-current Base Rent (together with the annual increase specified in Section 8 hereof) and (b) the then-current fair market value for comparable office and laboratory space in the East Cambridge submarket of comparable age, quality, level of finish and proximity to amenities and public transit, and containing the systems and improvements present in the Premises as of the date that Tenant gives Landlord written notice of Tenant's election to exercise the Option ("FMV"), and shall be further increased on each annual anniversary of the Option term commencement date by three percent (3%). Tenant may, no more than twelve (12) months prior to the date the Term is then scheduled to expire, request Landlord's estimate of the FMV for the Option term. Landlord shall, within fifteen (15) days after receipt of such request, give Tenant a written proposal of such FMV. If Tenant gives written notice to exercise the Option, such notice shall specify whether Tenant accepts Landlord's proposed estimate of FMV. If Tenant does not accept the FMV, then the parties shall endeavor to agree upon the FMV, taking into account all relevant factors, including (v) the size of the Premises, (w) the length of the Option term, (x) rent in comparable buildings in the relevant submarket, including concessions offered to new tenants, such as free rent, tenant improvement allowances and moving allowances, (y) Tenant's creditworthiness and (z) the

quality and location of the Building and the Project. In the event that the parties are unable to agree upon the FMV within thirty (30) days after Tenant notifies Landlord that Tenant is exercising the Option, then either party may request that the same be determined as follows: a senior officer of a nationally recognized leasing brokerage firm with local knowledge of the East Cambridge laboratory/research and development leasing submarket (the "Baseball Arbitrator") shall be selected and paid for jointly by Landlord and Tenant. If Landlord and Tenant are unable to agree upon the Baseball Arbitrator, then the same shall be designated by the local chapter of the Judicial Arbitration and Mediation Services or any successor organization thereto (the "JAMS"). The Baseball Arbitrator selected by the parties or designated by JAMS shall (y) have at least ten (10) years' experience in the leasing of laboratory/research and development space in the East Cambridge submarket and (z) not have been employed or retained by either Landlord or Tenant or any affiliate of either for a period of at least ten (10) years prior to appointment pursuant hereto. Each of Landlord and Tenant shall submit to the Baseball Arbitrator and to the other party its determination of the FMV. The Baseball Arbitrator shall grant to Landlord and Tenant a hearing and the right to submit evidence. The Baseball Arbitrator shall determine which of the two (2) FMV determinations more closely represents the actual FMV. The arbitrator may not select any other FMV for the Premises other than one submitted by Landlord or Tenant. The FMV selected by the Baseball Arbitrator shall be binding upon Landlord and Tenant and shall serve as the basis for determination of Base Rent payable for the Option term. If, as of the commencement date of the Option term, the amount of Base Rent payable during the Option term shall not have been determined, then, pending such determination, Tenant shall pay Base Rent equal to the Base Rent payable with respect to the last year of the then-current Term. After the final determination of Base Rent payable for the Option term, the parties shall promptly execute a written amendment to this Lease specifying the amount of Base Rent to be paid during the Option term. Any failure of the parties to execute such amendment shall not affect the validity of the FMV determined pursuant to this Section.

42.2. The Option is not assignable separate and apart from this Lease.

42.3. The Option is conditional upon Tenant giving Landlord written notice of its election to exercise the Option at least twelve (12) months prior to the end of the expiration of the then-current Term. Time shall be of the essence as to Tenant's exercise of the Option. Tenant assumes full responsibility for maintaining a record of the deadlines to exercise the Option. Tenant acknowledges that it would be inequitable to require Landlord to accept any exercise of the Option after the date provided for in this Section.

42.4. Notwithstanding anything contained in this Article to the contrary, Tenant shall not have the right to exercise the Option:

(a) During the time commencing from the date Landlord delivers to Tenant a written notice that Tenant is in default under any provisions of this Lease and continuing until Tenant has cured the specified default to Landlord's reasonable satisfaction; or

(b) At any time after any Default as described in Article 31 of the Lease (provided, however, that, for purposes of this Section 42.4(b), Landlord shall not be required to provide Tenant with notice of such Default) and continuing until Tenant cures any such Default, if such Default is susceptible to being cured; or

(c) In the event that Tenant has defaulted in the performance of its obligations under this Lease two (2) or more times during the twelve (12)-month period immediately prior to the date that Tenant intends to exercise the Option, whether or not Tenant has cured such defaults.

42.5. The period of time within which Tenant may exercise the Option shall not be extended or enlarged by reason of Tenant's inability to exercise such Option because of the provisions of Section 42.4.

42.6. All of Tenant's rights under the provisions of the Option shall terminate and be of no further force or effect even after Tenant's due and timely exercise of the Option if, after such exercise, but prior to the commencement date of the new term, (a) Tenant fails to pay to Landlord a monetary obligation of Tenant for a period of twenty (20) days after written notice from Landlord to Tenant, (b) Tenant fails to commence to cure a default (other than a monetary default) within thirty (30) days after the date Landlord gives notice to Tenant of such default or (c) Tenant has defaulted under this Lease two (2) or more times and a service or late charge under Section 31.1 has become payable for any such default, whether or not Tenant has cured such defaults.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the parties hereto have executed this Lease as a sealed Massachusetts instrument as of the date first above written.

LANDLORD:

BMR-HAMPSHIRE LLC,
a Delaware limited liability company

By: /s/ William Kane
Name: William Kane
Title: Senior Vice President East Coast Leasing

TENANT:

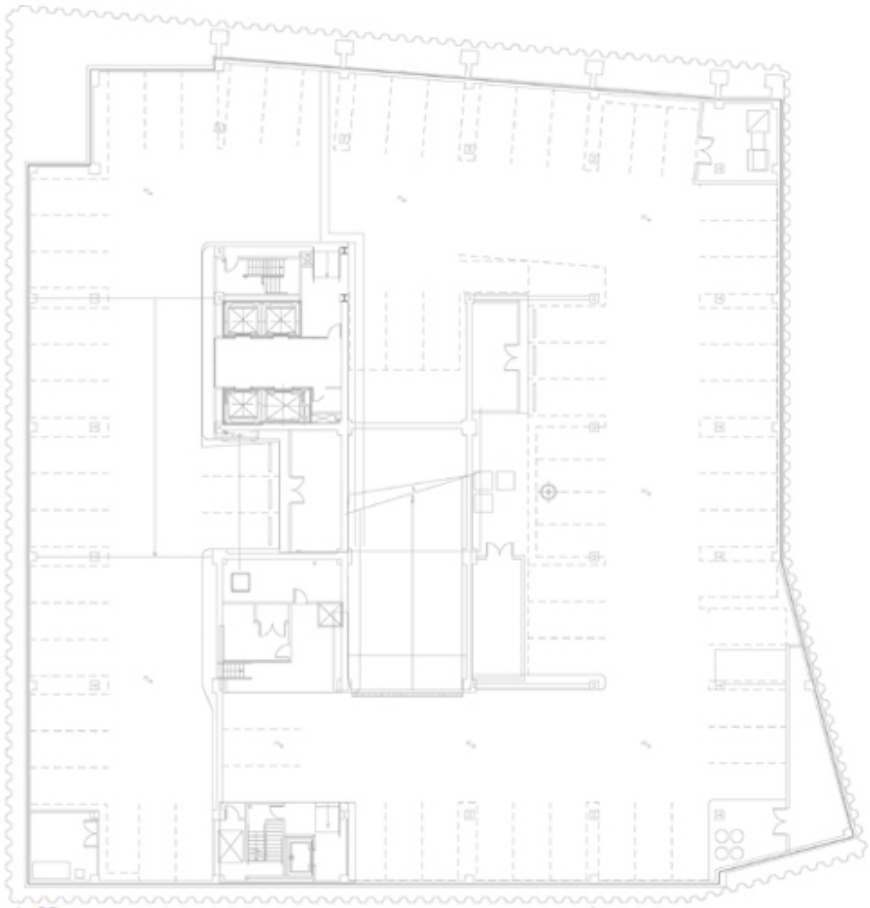
SURFACE ONCOLOGY, INC., a Delaware corporation

By: /s/ Detlev Biniszkiewicz
Name: Detlev Biniszkiewicz
Title: CEO & President

EXHIBIT A

PREMISES

A-1



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

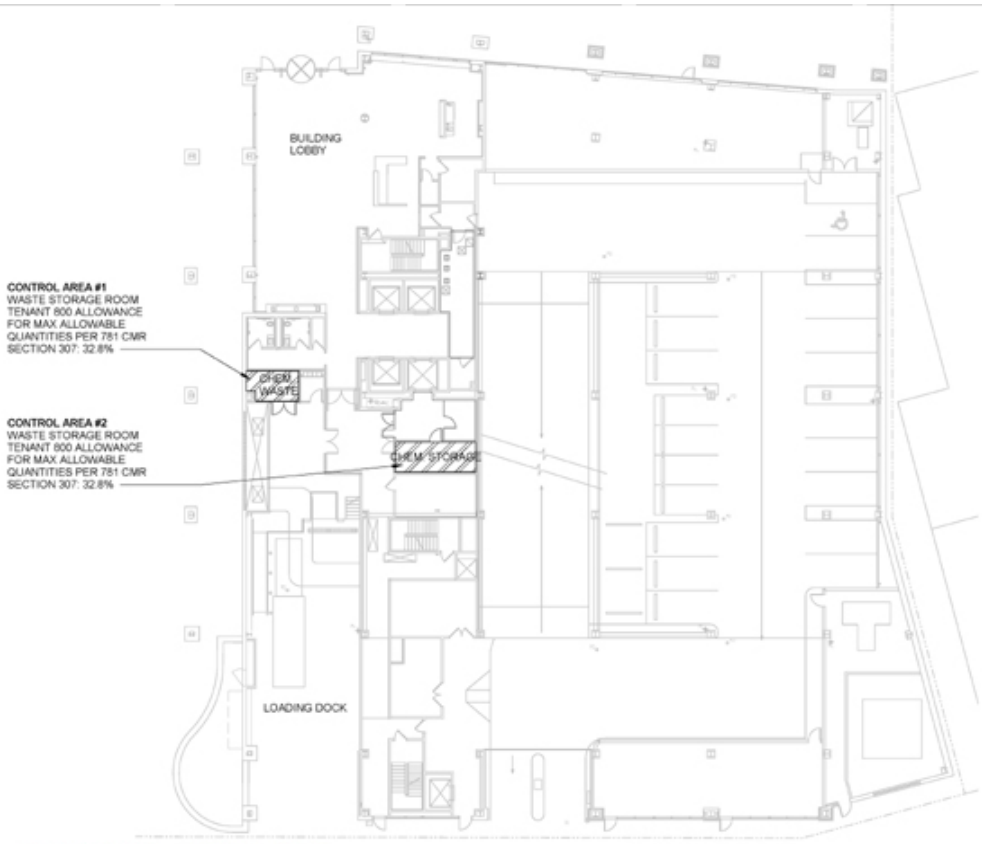
ARROWSTREET
ARCHITECTURE & DESIGN

BioMed Realty

50 HAMPSHIRE
50 Hampshire Street
Cambridge, MA

May 9, 2016
PREMISES PLAN. BASEMENT SUITE 800
3 / 64" = 1'- 0"

BASEMENT



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

C. MAX ALLOWABLE QUANTITIES TOTAL PER CONTROL AREA AT LEVEL ONE IS 100%, PER 781 CMR, SECTION 307. UP TO (4) CONTROL AREAS ARE PERMITTED AT GROUND LEVEL.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ARROWSTREET
ARCHITECTURE & DESIGN

BioMed Realty

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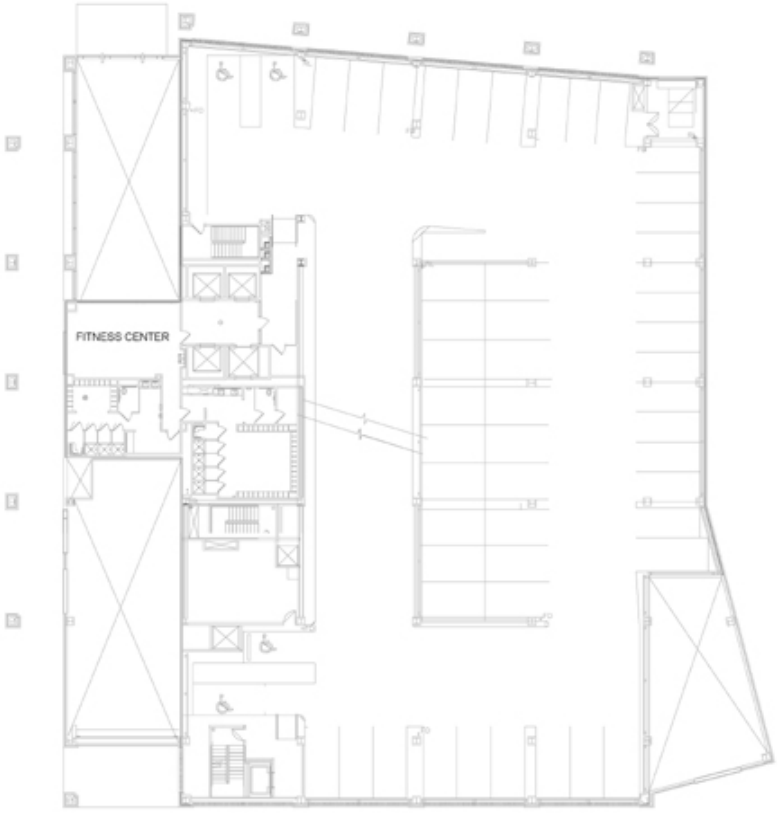
Cambridge, MA

May 9, 2016

PREMISES PLAN. GROUND LEVEL SUITE 800

3 / 64" = 1'- 0"

GROUND LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ARROWSTREET
ARCHITECTURE & DESIGN

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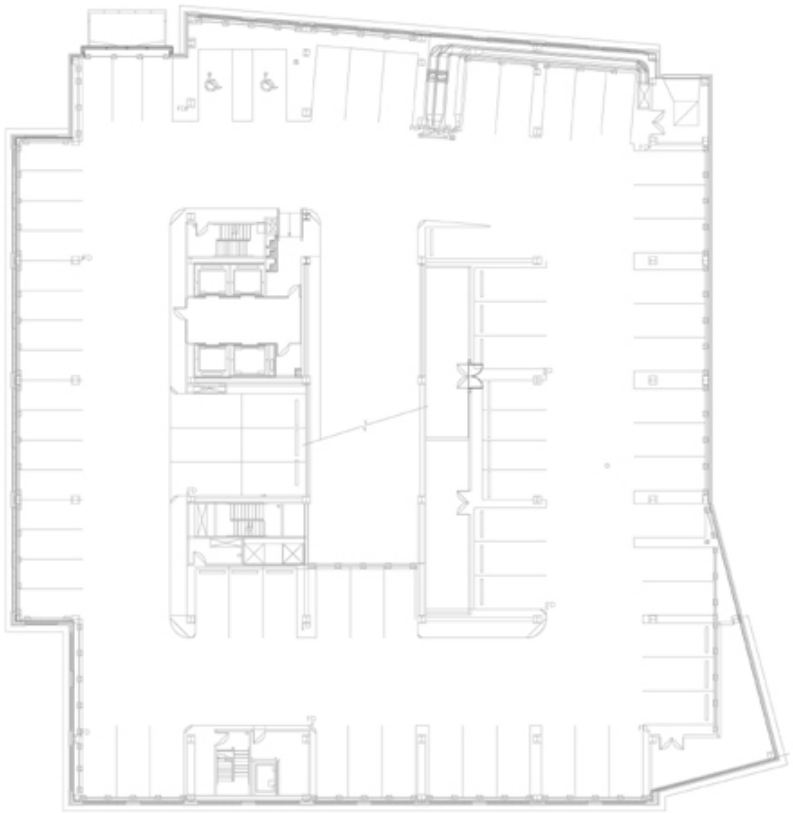
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 2nd SUITE 800
3 / 64" = 1'- 0"

SECOND LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

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ARCHITECTURE & DESIGN

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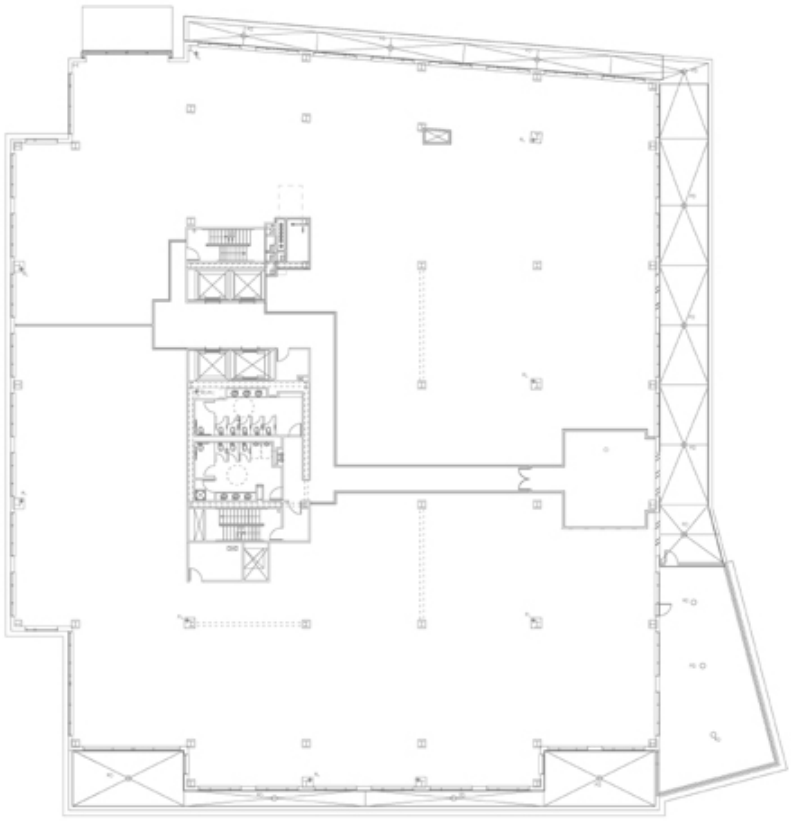
May 9, 2016
PREMISES PLAN. LEVEL 3rd SUITE 800
3 / 64" = 1'- 0"

THIRD LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ARROWSTREET
ARCHITECTURE & DESIGN

BioMed Realty

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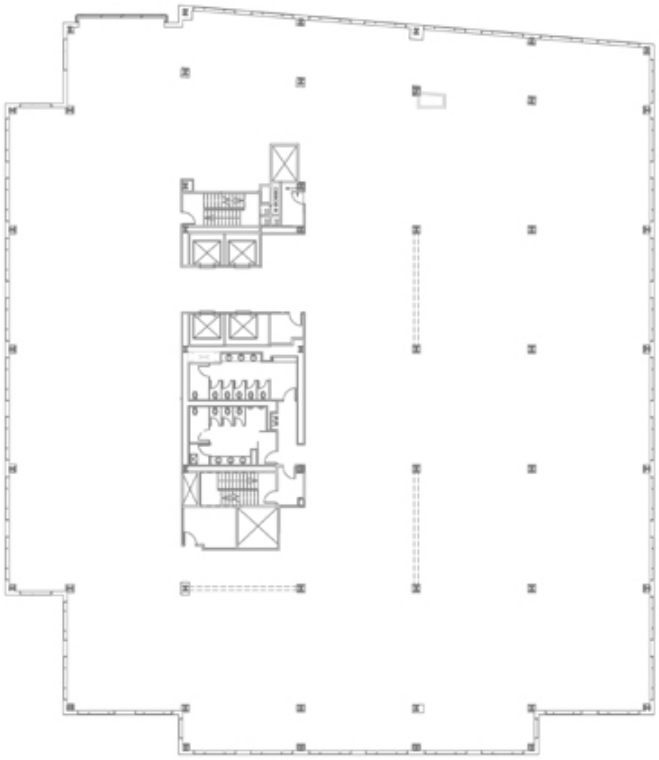
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 4th SUITE 800
3 / 64" = 1'- 0"

FOURTH LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ARROWSTREET
ARCHITECTURE & DESIGN

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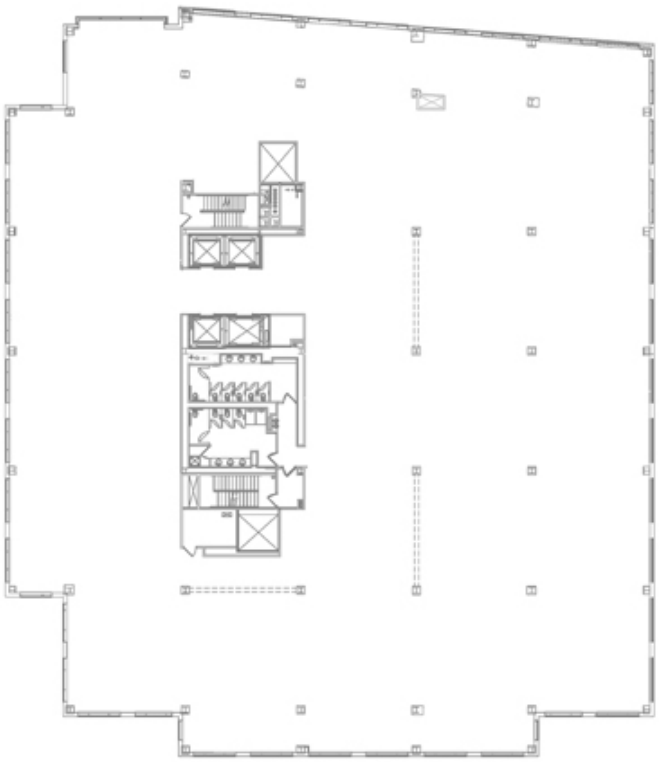
50 Hampshire Street
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 5th SUITE 800
3 / 64" = 1'- 0"

FIFTH LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ARROWSTREET
ARCHITECTURE & DESIGN

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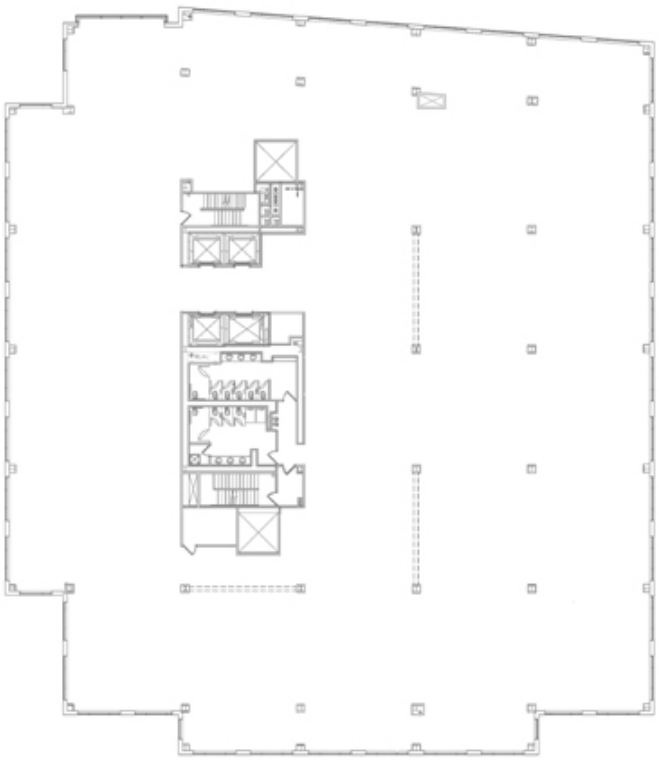
50 Hampshire Street
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 6th SUITE 800
3 / 64" = 1'- 0"

SIXTH LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ARROWSTREET
ARCHITECTURE & DESIGN

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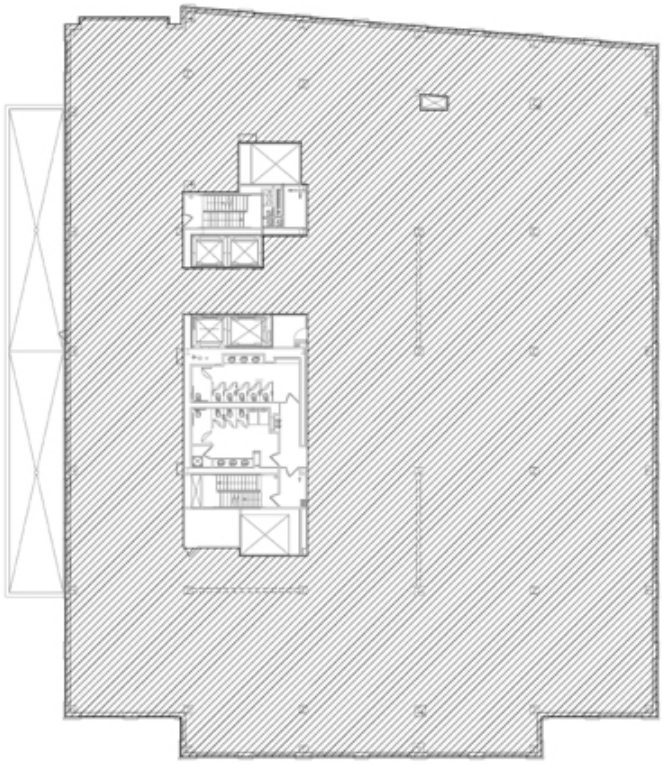
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 7th SUITE 800
3 / 64" = 1'- 0"

SEVENTH LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

C. TENANT 800 ALLOWANCE FOR MAX ALLOWABLE QUANTITIES (MAQ) AT LEVEL 8, PER 781 CMR, SECTION 307: 5.0% PER 781 CMR, SECTION 307, UP TO (2) CONTROL AREAS ARE PERMITTED AT EIGHTH LEVEL.

PERCENTAGE BASED ON SINGLE CONTROL AREA FOR THE ENTIRE FLOOR. MAX ALLOWABLE QUANTITIES MAY BE INCREASED IF TENANT DECIDES TO SEGREGATE ALL OR A PORTION OF THEIR PREMISES TO MEET CONTROL AREA SEPARATION AREA REQUIREMENTS PER 780 CMR.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

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ARCHITECTURE & DESIGN

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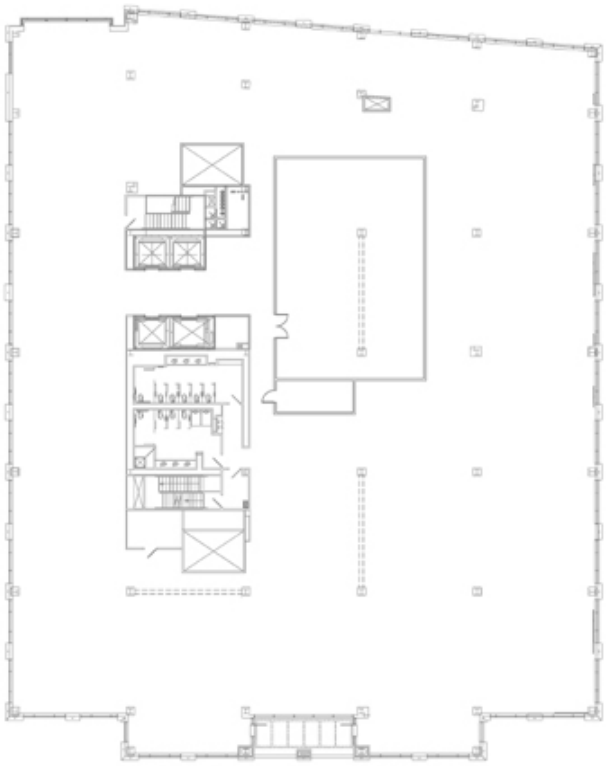
50 Hampshire Street
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 8th SUITE 800
3 / 64" = 1'- 0"

EIGHTH LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

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ARCHITECTURE & DESIGN

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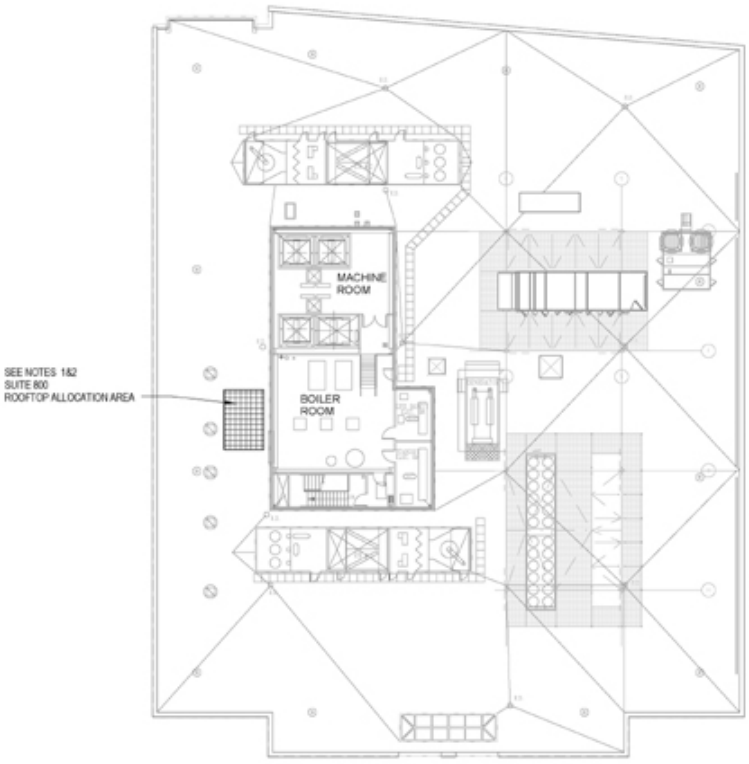
50 Hampshire Street
Cambridge, MA

May 9, 2016
PREMISES PLAN. LEVEL 9th SUITE 800
3 / 64" = 1'- 0"

NINTH LEVEL



NOTES.

A. USE OR STORAGE OF HAZARDOUS MATERIALS IS PROHIBITED IN THE BASEMENT, AND RETAIL AREAS.

B. REFER TO FIRST AND EIGHTH FLOOR PLANS FOR CONTROL AREA INFORMATION.

NOTE 1
ALL NEW TENANT EQUIPMENT SUBJECT TO MEET ALL CODES INCLUDING CAMBRIDGE SOUND ORDINANCE REQUIREMENTS. MITIGATION AS REQUIRED TO MEET THESE REQUIREMENTS FOR NEW TENANT EQUIPMENT SHALL BE BY TENANT

NOTE 2
ROOFTOP ALLOCATION AREAS ARE NOT INCLUDED IN RSF.

PREMISES PLAN NOTES AND LEGEND

TENANT PREMISES

ROOFTOP ALLOCATION AREAS

ARROWSTREET
ARCHITECTURE & DESIGN

BioMed Realty

50 HAMPSHIRE
50 Hampshire Street
Cambridge, MA

May 9, 2016
ROOFTOP ALLOCATION AREAS. SUITE 800
3 / 64" = 1'- 0"

ROOF LEVEL

EXHIBIT B

WORK LETTER

This Work Letter (this "Work Letter") is made and entered into as of the 13th day of May, 2016, by and between BMR-HAMPSHIRE LLC, a Delaware limited liability company ("Landlord"), and SURFACE ONCOLOGY, INC., a Delaware corporation ("Tenant"), and is attached to and made a part of that certain Lease dated as of May 13, 2016 (as the same may be amended, amended and restated, supplemented or otherwise modified from time to time, the "Lease"), by and between Landlord and Tenant for the Premises located at 50 Hampshire Street, Cambridge, Massachusetts. All capitalized terms used but not otherwise defined herein shall have the meanings given them in the Lease.

1. General Requirements.

1.1. Authorized Representatives.

(a) Landlord designates, as Landlord's authorized representative ("Landlord's Authorized Representative"), (i) Edward McDonald as the person authorized to initial plans, drawings, approvals and to sign change orders pursuant to this Work Letter and (ii) an officer of Landlord as the person authorized to sign any amendments to this Work Letter or the Lease. Tenant shall not be obligated to respond to or act upon any such item until such item has been initialed or signed (as applicable) by the appropriate Landlord's Authorized Representative. Landlord may change either Landlord's Authorized Representative upon one (1) business day's prior written notice to Tenant.

(b) Tenant designates Jessica Fees ("Tenant's Authorized Representative") as the person authorized to initial and sign all plans, drawings, change orders and approvals pursuant to this Work Letter. Landlord shall not be obligated to respond to or act upon any such item until such item has been initialed or signed (as applicable) by Tenant's Authorized Representative. Tenant may change Tenant's Authorized Representative upon one (1) business day's prior written notice to Landlord.

1.2. Schedule. The schedule for design and development of the Tenant Improvements, including the time periods for preparation and review of construction documents, approvals and performance, shall be in accordance with the schedule attached hereto as Attachment 1 (the "Schedule"). The Schedule shall be subject to adjustment as mutually agreed upon in writing by the parties, or as otherwise provided in this Work Letter.

1.3. Landlord's Architects, Contractors and Consultants. The architect, engineering consultants, design team, general contractor and subcontractors responsible for the construction of the Tenant Improvements shall be selected by Landlord.

1.4. Construction Meetings. Landlord, its general contractor and Tenant shall reasonably cooperate to schedule and conduct regular construction meetings (approximately once per week, except as otherwise agreed to by the parties) regarding the progress of the Tenant Improvements and Landlord's Work. During such meetings, Landlord shall use commercially reasonable efforts to notify Tenant of any potential delays in construction. Tenant's representative shall have the right to attend such meetings via conference call or other reasonably agreed means.

2. Tenant Improvements. All Tenant Improvements shall be performed by Landlord's contractor, at Tenant's sole cost and expense (subject to Landlord's obligations with respect to any portion of the TI Allowance used by Landlord in completing the Tenant Improvements) and in substantial accordance with the Approved Plans (as defined below), the Lease and this Work Letter. To the extent that the total projected cost of the Tenant Improvements (as projected by Landlord) exceeds the TI Allowance (such excess, the "Excess TI Costs"), Tenant shall pay the costs of the Tenant Improvements on a pari passu basis with Landlord as such costs become due, in the proportion of Excess TI Costs payable by Tenant to the TI Allowance payable by Landlord. If the cost of the Tenant Improvements (as projected by Landlord) increases over Landlord's initial projection, then Landlord may notify Tenant and Tenant shall pay any additional Excess TI Costs with Landlord in the same manner that Tenant is required to pay the initial Excess TI Costs, as aforesaid. If Tenant fails to pay, or is late in paying, any sum due to Landlord under this Work Letter, then Landlord shall have all of the rights and remedies set forth in the Lease for nonpayment of Rent (including the right to interest and the right to assess a late charge), and for purposes of any litigation instituted with regard to such amounts the same shall be considered Rent. All material and equipment furnished by Landlord or its contractors as the Tenant Improvements shall be new or "like new," and the Tenant Improvements shall be performed in a first-class, workmanlike manner.

2.1. Work Plans. Landlord and Tenant hereby approve the schematic plans for the Tenant Improvements, copies of which are attached as Attachment 2 to this Work Letter (the "Approved Schematic Plans").

2.2. Construction Plans. Landlord shall prepare final plans and specifications for the Tenant Improvements that (a) are consistent with and are logical evolutions of the Approved Schematic Plans and (b) incorporate any other Tenant-requested (and Landlord-approved) Changes (as defined below). As soon as such final plans and specifications ("Construction Plans") are completed, Landlord shall deliver the same to Tenant for Tenant's approval, which approval shall not be unreasonably withheld, conditioned or delayed. Such Construction Plans shall be approved or disapproved by Tenant within five (5) days after delivery to Tenant. Tenant's failure to respond within such five (5) day period shall be deemed approval by Tenant. If the Construction Plans are disapproved by Tenant, then Tenant shall notify Landlord in writing of its reasonable objections to such Construction Plans, and the parties shall confer and negotiate in good faith to reach agreement on the Construction Plans. Promptly after the Construction Plans are approved by Landlord and Tenant, two (2) copies of such Construction Plans shall be initialed and dated by Landlord and Tenant, and Landlord shall promptly submit such Construction Plans to all appropriate Governmental Authorities for approval. The Construction Plans so approved, and all change orders specifically permitted by this Work Letter, are referred to herein as the "Approved Plans."

2.3. Changes to the Tenant Improvements. Any changes to the Approved Plans (each, a "Change") shall be requested and instituted in accordance with the provisions of this Article 2 and shall be subject to the written approval of the non-requesting party in accordance with this Work Letter.

(a) Change Request. Either Landlord or Tenant may request Changes after Tenant approves the Approved Plans by notifying the other party thereof in writing in substantially the same form as the AIA standard change order form (a "Change Request"), which Change Request shall detail the nature and extent of any requested Changes, including (a) the Change, (b) the party required to perform the Change and (c) any modification of the Approved Plans and the Schedule, as applicable, necessitated by the Change. If the nature of a Change requires revisions to the Approved Plans, then the requesting party shall be solely responsible for the cost and expense of such revisions and any increases in the cost of the Tenant Improvements as a result of such Change. Change Requests shall be signed by the requesting party's Authorized Representative.

(b) Approval of Changes. All Change Requests shall be subject to the other party's prior written approval, which approval shall not be unreasonably withheld, conditioned or delayed. The non-requesting party shall have five (5) business days after receipt of a Change Request to notify the requesting party in writing of the non-requesting party's decision either to approve or object to the Change Request. The non-requesting party's failure to respond within such five (5) business day period shall be deemed approval by the non-requesting party.

3. Requests for Consent. Except as otherwise provided in this Work Letter, Tenant shall respond to all requests for consents, approvals or directions made by Landlord pursuant to this Work Letter within five (5) days following Tenant's receipt of such request. Tenant's failure to respond within such five (5) day period shall be deemed approval by Tenant.

4. TI Allowance.

4.1. Application of TI Allowance. Landlord shall contribute the TI Allowance and any Excess TI Costs advanced by Tenant to Landlord toward the costs and expenses incurred in connection with the performance of the Tenant Improvements, in accordance with Article 4 of the Lease. If the entire TI Allowance is not applied toward or reserved for the costs of the Tenant Improvements, then Tenant shall not be entitled to a credit of such unused portion of the TI Allowance. If the entire Excess TI Costs advanced by Tenant to Landlord are not applied toward the costs of the Tenant Improvements, then Landlord shall promptly return such excess to Tenant following completion of the Tenant Improvements. Tenant may apply the TI Allowance for the payment of construction and other costs in accordance with the terms and provisions of the Lease.

4.2. Approval of Budget for the Tenant Improvements. The parties agree that the initial budget for the Tenant Improvements is attached hereto as Attachment 3 (the "Approved Budget"). Tenant shall promptly reimburse Landlord for costs or expenses relating to the Tenant Improvements that exceed the amount of the TI Allowance, including paying any Excess TI Costs in accordance with this Work Letter.

5. Miscellaneous.

5.1. Incorporation of Lease Provisions. Sections 40.6 through 40.19 of the Lease are incorporated into this Work Letter by reference, and shall apply to this Work Letter in the same way that they apply to the Lease.

5.2. General. Except as otherwise set forth in the Lease or this Work Letter, this Work Letter shall not apply to improvements performed in any additional premises added to the Premises at any time or from time to time, whether by any options under the Lease or otherwise; or to any portion of the Premises or any additions to the Premises in the event of a renewal or extension of the original Term, whether by any options under the Lease or otherwise, unless the Lease or any amendment or supplement to the Lease expressly provides that such additional premises are to be delivered to Tenant in the same condition as the initial Premises.

5.3. Punch list. Within ten (10) days after the date of Substantial Completion of the Tenant Improvements, Landlord's Authorized Representative and Tenant's Authorized Representative shall inspect the Premises and identify "punch list" items of the Tenant Improvements (i.e., minor defects or conditions in the Tenant Improvements that do not materially and adversely interfere with Tenant's use and occupancy of the Premises for the permitted use set forth in the Lease) and jointly prepare a written list of such "punch list" items. Landlord shall use commercially reasonable efforts to complete all "punch list" items within thirty (30) days after such inspection, subject to Force Majeure or any delay caused by the action or omission of Tenant, its employees, contractors or representatives.

5.4. Warranties. To the extent assignable, Landlord will assign all warranties obtained by Landlord in connection with the Tenant Improvements, including, without limitation, any equipment for the Premises installed by Landlord; provided, however, that, notwithstanding any such assignment, Landlord shall also retain the right to enforce such warranties against the applicable contractor, at Landlord's sole option, and further provided that if any such warranties are not assignable, then Landlord, upon written notice from Tenant, shall use commercially reasonable efforts to enforce such non-assignable warranties. With respect to those warranties that have been assigned to Tenant, upon Tenant's written request of Landlord and at Tenant's sole cost and expense, Landlord shall reasonably cooperate with Tenant in enforcing such warranties; provided, however, that Landlord shall no have obligations under this sentence in connection with any litigation between Tenant and the provider of such warranty.

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IN WITNESS WHEREOF, Landlord and Tenant have executed this Work Letter as a sealed Massachusetts instrument to be effective on the date first above written.

BMR-HAMPSHlRE LLC,
a Delaware limited liability company

By: /s/ William Kane
Name: William Kane
Title: Senior Vice President East Coast Leasing

TENANT:

SURFACE ONCOLOGY, INC.,
a Delaware corporation

By: /s/ Detlev Biniszkiewicz
Name: Detlev Biniszkiewicz
Title: CEO & President

Attachment 1 to Work Letter

Schedule

[See attached]

ID	Task Name	Duration	Start	Finish	Predecessors
1	**50 HAMPSHIRE ST BMR**	**207.5 days**	**Mon 5/16/16**	**Wed 3/8/17**	
2	**8TH FLOOR TENANT FITOUT**	**207.5 days**	**Mon 5/16/16**	**Wed 3/8/17**	
3	**DESIGN**	**39 days**	**Mon 5/16/16**	**Mon 7/11/16**	
4	CONSTRUCTION DOCUMENTS	1 day	Mon 5/16/16	Mon 5/16/16	
5	CD PRICING	15 days	Fri 5/27/16	Fri 6/17/16	4FS+8 days
6	GMP ESTABLISHED	30 days	Fri 5/27/16	Mon 7/11/16	5SS
7	TI BUILDING PERMIT PROCESS	20 days	Tue 5/17/16	Tue 6/14/16	4
8	**PURCHASING**	**35 days**	**Tue 5/17/16**	**Wed 7/6/16**	
9	AWARD MEP TRADES	3 wks	Tue 5/17/16	Tue 6/7/16	4
10	AWARD LAB CASEWORK	3 wks	Tue 5/17/16	Tue 6/7/16	9SS
11	AWARD DRYWALL	1 wk	Wed 6/8/16	Tue 6/14/16	9
12	AWARD FINISH TRADES	4 wks	Wed 6/8/16	Wed 7/6/16	11SS
13	**MATERIAL/EQUIPMENT ESTIMATED LEAD TIMES AFTER APPROVAL (ANYTHING > 4 WEEKS)**	**120 days**	**Wed 6/29/16**	**Mon 12/19/16**	
14	SUBMITTAL APPROVAL PROCESS FOR LONG LEAD MEP ITEMS	4 wks	Wed 6/29/16	Wed 7/27/16	9FS+3 wks
15	OPTIONAL STAND BY GENERATOR W/ ENCLOSURE (?PRE-PURCHASE)	20 wks	Thu 7/28/16	Mon 12/19/16	14
16	GENERATOR SWITCHBOARD (?PRE-PURCHASE)	20 wks	Thu 7/28/16	Mon 12/19/16	15SS
17	FUEL STORAGE TANK (? PRE-PURCHASE)	16 wks	Thu 7/28/16	Fri 11/18/16	15SS
18	STEAM BOILER	12 wks	Thu 7/28/16	Fri 10/21/16	15SS
19	FUEL OIL PUMP	12 wks	Thu 7/28/16	Fri 10/21/16	15SS
20	EXHAUST FANS/CIF'S	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
21	VAV'S/FPT'S (? PRE-PURCHASE/EARLY RELEASE TO MEET ROUGH IN SCHEUDLE)	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
22	HEAT PUMPS	10 wks	Thu 7/28/16	Thu 10/6/16	15SS
23	PHOENIX VALVES (? PRE-PURCHASE/EARLY RELEASE TO MEET ROUGH-IN SCHEDULE)	10 wks	Thu 7/28/16	Thu 10/6/16	15SS
24	STEAM HUMIDIFIERS	10 wks	Thu 7/28/16	Thu 10/6/16	15SS
25	COILS	6 wks	Thu 7/28/16	Thu 9/8/16	15SS
26	SOUND ATTENUATORS	6 wks	Thu 7/28/16	Thu 9/8/16	15SS
27	HV-1	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
28	STAINLESS STEEL DIFFUSERS	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
29	RODI SKID	10 wks	Thu 7/28/16	Thu 10/6/16	15SS
30	VAC SYSTEM	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
31	CA SYSTEM	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
32	PH NUETRALIZATION SYSTEM	10 wks	Thu 7/28/16	Thu 10/6/16	15SS

Project: 50Hampshire8th floor fitout 31
Date: Thu 3/10/16

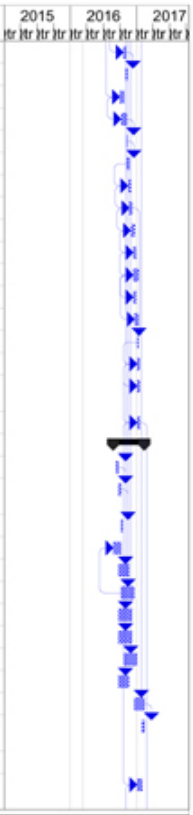
Task	External Milestone	Manual Summary Rollup	
Split	Inactive Task	Manual Summary	
Milestone	Inactive Milestone	Start-only	
Summary	Inactive Summary	Finish-only	
Project Summary	Manual Task	Progress	
External Tasks	Duration-only	Deadline	

ID	Task Name	Duration	Start	Finish	Predecessors
33	WATER HEATERS	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
34	LAB SINKS	8 wks	Thu 7/28/16	Thu 9/22/16	15SS
35	LIGHTING	14 wks	Thu 7/28/16	Fri 11/4/16	15SS
36	PANEL BOARDS	6 wks	Thu 7/28/16	Thu 9/8/16	15SS
37	SUBMITTAL APPROVAL PROCESS FOR LAB COMPONENTS	3 wks	Thu 7/7/16	Wed 7/27/16	10FS+4 wks
38	LAB CASEWORK	8 wks	Thu 7/28/16	Thu 9/22/16	37
39	FUME HOODS/BSC'S	8 wks	Thu 7/28/16	Thu 9/22/16	38SS
40	AUTOCLAVES	12 wks	Thu 7/28/16	Fri 10/21/16	38SS
41	GLASS WASHERS	10 wks	Thu 7/28/16	Thu 10/6/16	38SS
42	COLD ROOM	12 wks	Thu 7/28/16	Fri 10/21/16	38SS
43	SUBMITTAL APPROVAL PROCESS FOR MISC FINISHES	4 wks	Thu 7/28/16	Wed 8/24/16	12FS+3 wks
44	RUBBER FLOORING	8 wks	Thu 8/25/16	Fri 10/21/16	43
45	CARPET	8 wks	Thu 8/25/16	Fri 10/21/16	44SS
46	GLASS DOORS	8 wks	Thu 8/25/16	Fri 10/21/16	44SS
47	MOTORIZED SHADES	8 wks	Thu 8/25/16	Fri 10/21/16	44SS
48	GFRC COLUMN COVERS	8 wks	Thu 8/25/16	Fri 10/21/16	44SS
49	ARMOUR COAT WALL PANELS	8 wks	Thu 8/25/16	Fri 10/21/16	44SS
50	LOCKERS	8 wks	Thu 8/25/16	Fri 10/21/16	44SS
51	WOOD DOORS	10 wks	Thu 8/25/16	Fri 11/4/16	44SS
52	**INTERIOR LAB FINISH CONSTRUCTION SUMMARY**	**191.5 days**	**Wed 6/8/16**	**Wed 3/8/17**	
53	**FLOOR 8**	**156.5 days**	**Wed 6/8/16**	**Wed 1/18/17**	
54	MEP/FP COORDINATION	4 wks	Wed 6/8/16	Wed 7/6/16	9
55	LAYOUT PARTITIONS/TOP TRACK INSTALL	3 wks	Wed 6/22/16	Wed 7/13/16	54SS+2 wks,7
56	MEP/FP ABOVE CEILING ROUGH	5 wks	Thu 7/7/16	Wed 8/10/16	54
57	PARTITION FRAMING/DOOR FRAMES/BLOCKING	2 wks	Thu 8/4/16	Wed 8/17/16	56SS+4 wks
58	IN WALL ROUGH (INCLUDE SECURITY/AV/TELDATA/ATC)	3 wks	Thu 8/11/16	Wed 8/31/16	57SS+1 wk
59	ROUGH WALL INSPECTIONS	1 day	Thu 9/1/16	Thu 9/1/16	58
60	BOARD WALLS	2.5 wks	Fri 9/2/16	Wed 9/21/16	59
61	TAPE/SAND WALLS	3 wks	Mon 9/12/16	Fri 9/30/16	60SS+1 wk
62	PRIME PAINT WALLS	1 wk	Wed 9/28/16	Wed 10/5/16	61SS+2.5 wks
63	SOFFIT/HARD CEILING FRAMING	1 wk	Wed 9/21/16	Wed 9/28/16	60
64	MEP/FP ROUGHS TO SOFFITS/HARD CEILINGS	2 wks	Wed 9/28/16	Thu 10/13/16	63
65	GWB SOFFITS/HARD CEILINGS	1 wk	Thu 10/13/16	Thu 10/20/16	64
66	TAPE & SAND SOFFITS/HARD CEILINGS	2 wks	Thu 10/20/16	Thu 11/3/16	65

Project: 50Hampshire8th floor fitout 31
Date: Thu 3/10/16

Task	External Milestone	Manual Summary Rollup	
Split	Inactive Task	Manual Summary	
Milestone	Inactive Milestone	Start-only	
Summary	Inactive Summary	Finish-only	
Project Summary	Manual Task	Progress	
External Tasks	Duration-only	Deadline	

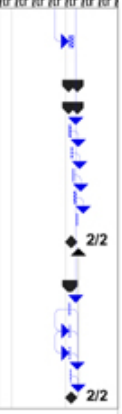
ID	Task Name	Duration	Start	Finish	Predecessors
67	GFRC COLUMN COVERS (INSTALL/TAPE/PAINT)	2 wks	Thu 10/20/16	Thu 11/3/16	66SS
68	PRIME PAINT SOFFITS/HARD CEILINGS	1 wk	Thu 11/3/16	Thu 11/10/16	67
69	CEILING GRID INSTALL (TERMINATIONS AT SOFFITS LATER)	3 wks	Fri 9/30/16	Mon 10/24/16	62SS+2 days
70	LIGHTS/RGD'S/SP HEADS	4 wks	Fri 10/7/16	Mon 11/7/16	69SS+1 wk
71	ABOVE CEILING INSPECTIONS	1 day	Mon 11/7/16	Tue 11/8/16	70
72	CEILING TILES	2 wks	Tue 11/8/16	Tue 11/22/16	71
73	TOUCH UP/FINISH PAINT WALLS/SOFFITS/CEILINGS	2 wks	Tue 11/15/16	Wed 11/30/16	72SS+1 wk
74	ALUMINUM FRAMING @ GLASS WALLS/FIELD MEASURE	2 wks	Tue 11/22/16	Wed 12/7/16	73SS+1 wk
75	FLOORING/BASE	3 wks	Wed 11/30/16	Wed 12/21/16	74SS+1 wk
76	MILLWORK INSTALL (INCLUDE ARMOUR COAT PANELS)	2 wks	Wed 12/14/16	Wed 12/28/16	75SS+2 wks
77	LAB CASEWORK/TOPS/SINKS/FUME HOODS/BSC'S INSTALL	4 wks	Wed 12/14/16	Wed 1/11/17	76SS
78	COLD ROOM INSTALL	2 wks	Wed 12/14/16	Wed 12/28/16	77SS
79	MEP CONNECTIONS TO LAB BENCHES/FUME HOOD'S/EQUIPMENT	3 wks	Wed 12/21/16	Wed 1/11/17	77SS+1 wk
80	GLAZING	1 wk	Wed 1/4/17	Wed 1/11/17	74FS+4 wks
81	DOORS/HARDWARE	2 wks	Wed 1/4/17	Wed 1/18/17	80SS
82	MISC SPECIALTIES (FEC'S/FE'S/LOCKERS/CORNER GUARDS/SIGNAGE/WINDOW TREATMENTS/APPLIANCES)	2 wks	Wed 1/4/17	Wed 1/18/17	81SS
83	MEP FINISHES	2 wks	Wed 1/4/17	Wed 1/18/17	81SS
84	**MECHANICAL LEVEL 1&2 + ROOFTOP**	**120 days**	**Thu 8/25/16**	**Mon 2/13/17**	
85	INSTALL/ FLASH SLEEPERS AS REQUIRED FOR EXHAUST FANS E.T.C.	2 wks	Fri 9/9/16	Thu 9/22/16	20FS-2 wks
86	INSTALL/FLASH ALL PIPE PENETRATIONS (PLUMBING/ELECTRICAL/CONTROLS E.T.C.)	2 wks	Fri 9/23/16	Thu 10/6/16	85
87	INSTALL/FLASH GENERATOR CURB	1 wk	Fri 10/7/16	Fri 10/14/16	86
88	MEP ROUGH TO EQUIPMENT	6 wks	Thu 8/25/16	Thu 10/6/16	90SS-6 wks
89	WATER HEATERS (INSTALL + TIE-IN)	8 wks	Fri 9/23/16	Fri 11/18/16	33
90	RODI SKID (INSTALL + TIE-IN)	10 wks	Fri 10/7/16	Mon 12/19/16	29
91	VAC SYSTEM (INSTALL + TIE-IN)	10 wks	Fri 9/23/16	Mon 12/5/16	30
92	COMPRESSED AIR SYSTEM (INSTALL + TIE-IN)	10 wks	Fri 9/23/16	Mon 12/5/16	31
93	STEAM BOILERS/ASSOCIATED FLUES (INSTALL + TIE-IN)	10 wks	Mon 10/24/16	Mon 1/2/17	18
94	ROOF EXHAUST FANS (INSTALL + TIE-IN)	8 wks	Fri 9/23/16	Fri 11/18/16	85
95	GENERATOR/ SWITCHBOARD (INSTALL + TIE-IN)	8 wks	Tue 12/20/16	Mon 2/13/17	15
96	BONDING OF ALL NEW ROOF TOP EQUIPMENT TO LIGHTNING PROTECTION SYSTEM	2 wks	Tue 1/31/17	Mon 2/13/17	95FS-2 wks
97					
98	**MEP SYSTEMS START-UP/BRINGING ON LINE/TAB OF WATER & AIR (BREAKOUT SCHEDULE LATER)**	4 wks	Wed 1/4/17	Wed 2/1/17	83SS



Project: 50Hampshire8th floor fitout 31
Date: Thu 3/10/16

Task	External Milestone	Manual Summary Rollup	
Split	Inactive Task	Manual Summary	
Milestone	Inactive Milestone	Start-only	
Summary	Inactive Summary	Finish-only	
Project Summary	Manual Task	Progress	
External Tasks	Duration-only	Deadline	

ID	Task Name	Duration	Start	Finish	Predecessors
99					
100	**COMMISSIONING/TRAINING (BREAKOUT SCHEDULE LATER)**	4 wks	Wed 1/18/17	Wed 2/15/17	98SS+2 wks
101					
102	**PUNCHLIST**	**35 days**	**Wed 1/18/17**	**Wed 3/8/17**	
103	**4th FLOOR-**	**35 days**	**Wed 1/18/17**	**Wed 3/8/17**	
104	JMA CREATES/TRACKS WORK TO COMPLETE LIST	2 wks	Wed 1/18/17	Wed 2/1/17	83
105	JMA CREATES/TRACKS PRE-PUNCH LIST	1 wk	Wed 2/1/17	Wed 2/8/17	104
106	OWNER/CONSULTANTS CREATE PUNCHLIST (ADD TO JMA PRE-PUNCH)	1 wk	Wed 2/8/17	Wed 2/15/17	105
107	JMA COMPLETES THE PUNCHLIST	2 wks	Wed 2/15/17	Wed 3/1/17	106
108	FINAL SIGN-OFF	1 wk	Wed 3/1/17	Wed 3/8/17	107
109	**SUBSTANTIAL COMPLETION**	0 days	Thu 2/2/17	Thu 2/2/17	116
110					
111	**C OF O PROCESS**	**11 days**	**Wed 1/18/17**	**Thu 2/2/17**	
112	FIRE DEPARTMENT TESTING	5 days	Wed 1/18/17	Wed 1/25/17	83
113	PLUMBING FINAL	3 days	Fri 1/20/17	Wed 1/25/17	112SS+2 days
114	ELECTRICAL FINAL	3 days	Fri 1/20/17	Wed 1/25/17	113SS
115	BUILDING FINAL	3 days	Wed 1/25/17	Mon 1/30/17	112,113,114
116	C OF O IN HAND	0 days	Thu 2/2/17	Thu 2/2/17	115FS+3 days



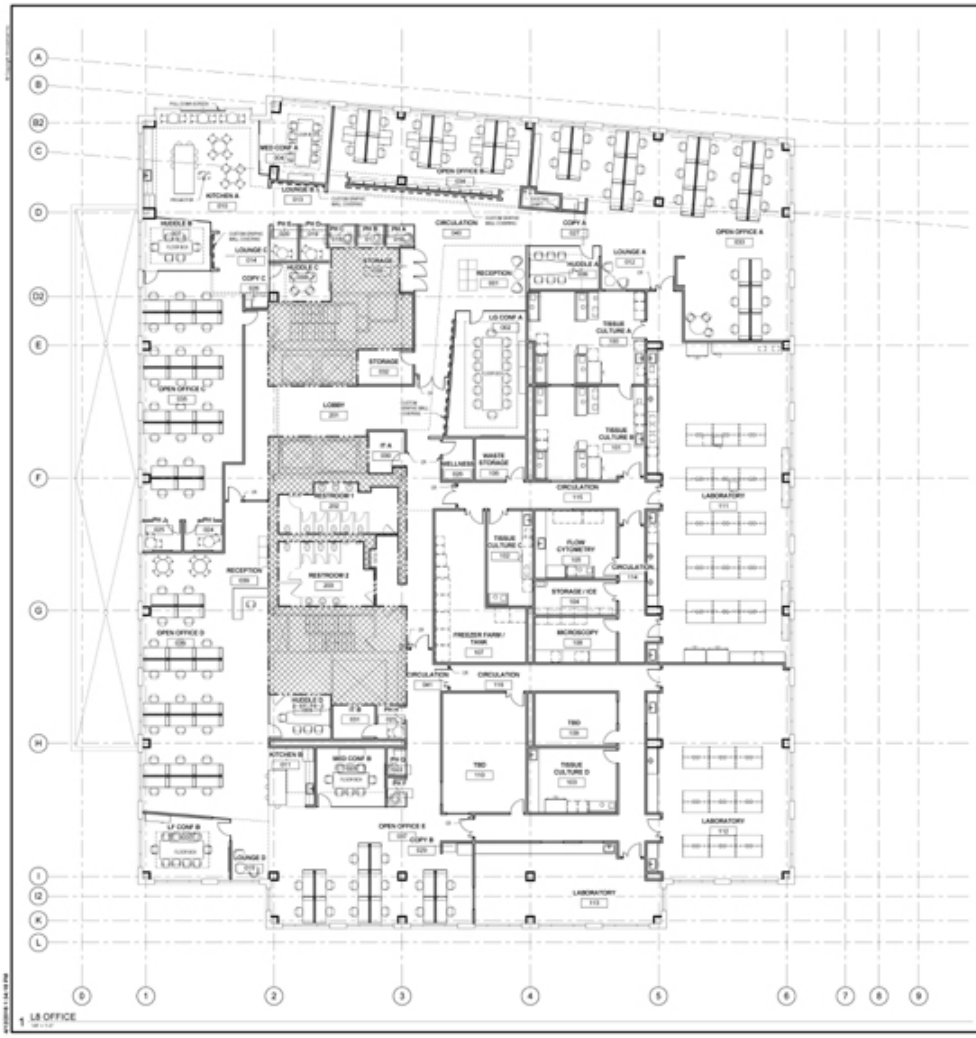
Project: 50Hampshire8th floor fitout 31
Date: Thu 3/10/16

Task	External Milestone	Manual Summary Rollup	
Split	Inactive Task	Manual Summary	
Milestone	Inactive Milestone	Start-only	
Summary	Inactive Summary	Finish-only	
Project Summary	Manual Task	Progress	
External Tasks	Duration-only	Deadline	

Attachment 2 to Work Letter

Approved Schematic Plans

[See attached]



CONSTRUCTION PLAN NOTES

FLOOR PLAN LEGEND

ROOM SCHEDULE

Number	Name	Area	Comments

50 Hampshire Street

SURFACE ONCOLOGY

50 Hampshire Street
Cambridge, MA

FIT PLAN

ARROWSTREET
ARCHITECTURE & DESIGN

10 POST OFFICE SQUARE
SUITE 700N
BOSTON MA 02109
617-623-5555
www.arrowstreet.com

Project Number	16010
Author	AT
Checker	CA
Issue date	04/06/2016

Revisions

No.	Date	Description

Drawing Title

8TH FLOOR FIT PLAN

SCALE 1/8" = 1'-0"

Drawing Number

A2.01

1 L8 OFFICE Ceiling Plan

REFLECTED CEILING PLAN NOTES

Ceiling Schedule

BioMed Realty

50 Hampshire Street

SURFACE ONCOLOGY

50 Hampshire Street
Cambridge, MA

FIT PLAN

ARROWSTREET
ARCHITECTURE & DESIGN

Project Number 19015
Author AT
Checker CA
Issue Date 04/08/2019

Revisions

No	Date	Description

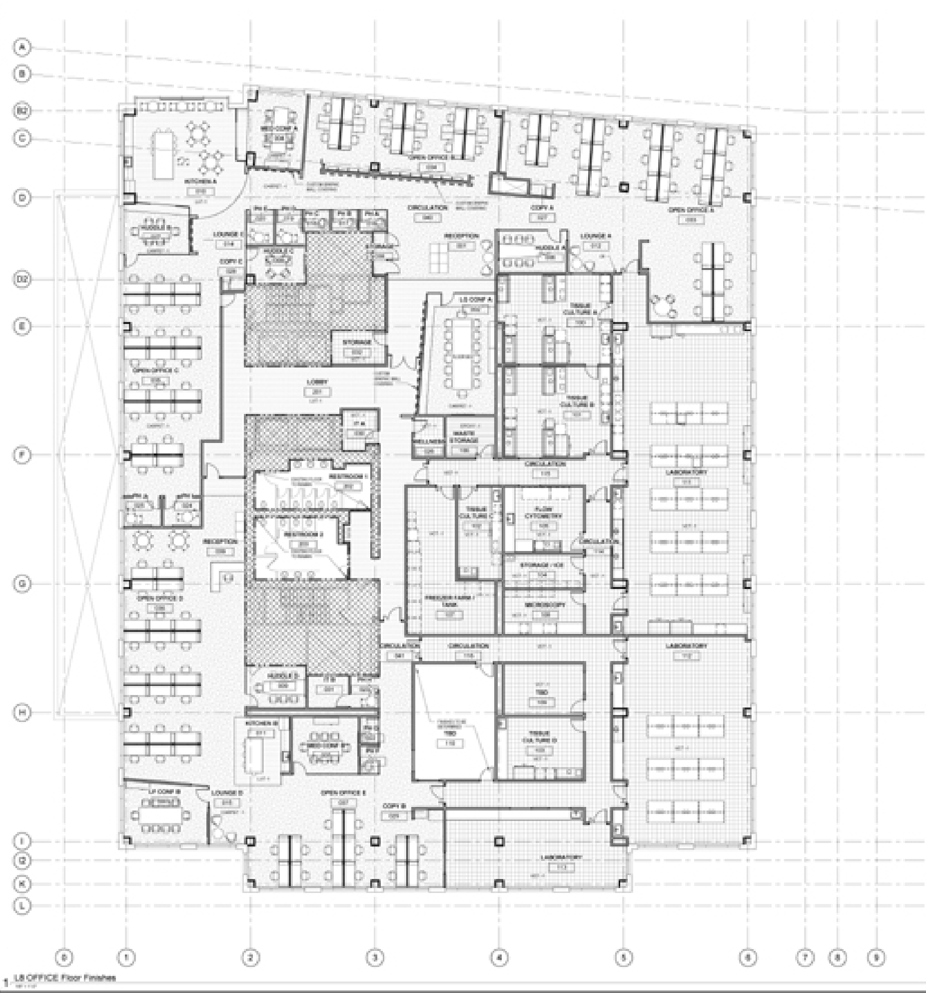
Drawing Title

8TH FLOOR
REFLECTED
CEILING PLAN

SCALE 1/8" = 1'-0"

Drawing Number

A2.20



Floor Finishes Schedule

Family and Type	Area	Function	Type Mark
[illegible]	[illegible]	[illegible]	[illegible]

BioMed Realty

50 Hampshire Street

SURFACE ONCOLOGY

50 Hampshire Street
Cambridge, MA

FIT PLAN

ARROWSTREET
ARCHITECTURE & DESIGN

Project Number
Author
Checker
Issue date

Revisions

Drawing Title

8TH FLOOR FINISHES PLAN

SCALE As indicated

Drawing Number

A5.01

www.aha-engineers.com

MEMORANDUM

To: Chris Brown (JMA)
Tim Stoll at BMR

From: Joe Kazlauskas and Bob Andrews

Date: April 13, 2016 ***Revised***

Subject: 50 Hampshire Street, Cambridge
Surface Oncology MEP Scope of Work

The intent of the below mechanical /electrical scope of work description is to capture the tenant improvement alterations for Surface Oncology based on the fit plan prepared by Arrowstreet dated 4/5/16, plus the equipment list dated 4/1/16 and our meeting on 4/12/16:

Fire Protection:

- Provide new sprinkler heads for tenant and common areas
- Rework branch lines to accommodate new head locations
- Existing mains to remain

Fire Alarm:

- Provide new devices to suit new tenant and common areas
- Extend cabling from existing system
- Provide additional modules needed to support new devices and interlocks needed

Plumbing

- In kitchen areas, provide cold water, domestic waste and vent, with an electric instant hot heater for hot water. Provide a cold water tap with filter for coffee maker and water system. Alternate price to provide cold water to refrigerator ice maker, and hot/cold to dishwasher in large kitchen with 30 gal electric water heater.
- Provide compressed air (1") and vacuum (2") distribution system to ceiling panels, closed labs equipment on equipment list (11 air, 10 vac) and 2 fume hoods.
- Each ceiling panel will have (1) CA and (1) Vac quick disconnect connections
    - The large exterior lab will have (6) ceiling panels
    - Small exterior lab will have (4) ceiling panels
- Large exterior lab will have three emergency shower / eyewash stations
- Small exterior lab will have two emergency shower /eyewash stations

Lexington, MA:
24 Hartwell Avenue
Third Floor
Lexington, MA 02421
T 781-372-3000
F 781-372-3100

Cambridge, MA:
700 Technology Square
Suite 402
Cambridge, MA 02139
T 781-372-3000

Atlanta, GA:
1801 Old Alabama Road
Suite 125
Roswell, GA 30076
T 770-992-8585
F 770-992-6902

Washington, DC:
3000 Wilson Boulevard
Suite 210
Arlington, VA 22201
T 571-451-1940

- RO loop (1 ¼“) with drops at each lab sink, along with non-potable hot/cold, lab waste and vent
- Tissue culture labs will have (4) Vac drops and (4) CO2 drops into BSCs with turrets
- Small exterior lab without benching, TBD labs, microscopy, and flow cytometry will have (2) CA and (2) Vac drops down the wall.
- Storage will have cold water with filter and floor drain waste for ice machine
- Tank room will have CO2 manifold and bottles for distribution to incubators (10 CO2 drops, including drops to incubators)
- Fire wrap all lab waste piping in the 7th floor ceiling space, due to return air plenum
- Any N2 needed will be local supply with point-of-use canisters or dewars.
- TBD Lab will receive NPCW, NPHW, Lab waste, and Lab vent for future sink.

HVAC:

- Office area provide fan powered terminal units with hot water reheat to exterior zones and VAV with reheat to interior zones, connected to the existing base building main ductwork and piping loops, based on zone layout delivered by AHA on April 6, 2016
- Exterior office zones shall include:
    - Large conference room B
    - Huddle room B
    - Main kitchen A
    - Medium conference room A
    - Two zones for corner open office area A
    - Four addition zones for remaining open office area B, C, D, & E
- Interior office zones shall include:
    - (3) Huddle rooms A, C, & D
    - (2) Reception areas
    - Medium conference room B
    - Large conference room A
    - Phone rooms
    - Common hallways
    - (6) additional interior zones for open office space
- Provide new supply air, exhaust air, chilled and hot water mains from the new lab core shell systems to serve the lab areas based on the lab area zone layout
- Tissue culture A & B shall have (1) supply air valve with reheat, (1) exhaust air valve, (1) cooling only cassette type fan coil units. Tissue culture C & D shall have (1) supply air valve with reheat, (1) exhaust air valve, (1) cooling only cassette type fan coil unit for each room.
- TBD labs, small exterior lab without benching, flow cytometry, microscopy, waste storage, tank area, storage/ice, and lab corridors shall have (1) supply air valve with reheat, (1) exhaust air valve each
- Freezer farm shall have (1) supply air valve with reheat, (1) exhaust air valve, and (2) 3 ton cooling only split systems on generator power
- Large exterior lab shall have (4) supply air valve with reheat, (3) exhaust air valve, (4) cooling only cassette type fan coil units
- Small exterior lab shall have (2) supply air valve with reheat, (2) exhaust air valve, (2) cooling only cassette type fan coil units
- Lab 113 shall have (1) supply air valve with reheat, (1) exhaust air valve.

- IT room A shall have two wall mounted 2 ton split system fan coils on generator power. IT room B shall have one 500 CFM ceiling type box fan ducted to ceiling plenum on generator power.

Electrical:

- Provide office and lab lighting throughout
- Provide exit signs and emergency lighting connected to the base building life safety generator throughout
- Each group of work stations shall have an 8 wire system, 3 circuit power feed and T/D drop.
- Each phone room shall have (1) outlet, (1) T/D
- Huddle rooms (3) outlets, (3) T/D
- Main kitchen power for appliances (refrigerator, coffee maker, water filter dispenser, microwave), (3) T/D, (4) convenience outlets. Small kitchen same, but two convenience outlets.
- Each printer copier area (2) duplex outlets, (2) T/D
- Large conference rooms (6) outlets, (6) T/D, center floor box, and power and TD to flat screen, AV conduits
- Reception areas shall have (4) outlets, (4) T/D
- Open office areas shall have convenience outlets, one per 20 feet
- See plumbing for quantity of ceiling panels, each ceiling panel shall have (2) dedicated 20 amp circuits, (2) T/D boxes, (4) receptacles
- Interior wall of all exterior labs shall have an outlet every 3 feet, with every third outlet on generator power, all will be 20 amp dedicated circuits
- Tissue culture shall have (4) dedicated 20 amp circuits for BSC’s, (4) dedicated generator power 20 amp circuits for incubators, and an additional (8) misc. circuits
- TBD labs, flow cytometry, microscopy, shall have (10) 20 amp circuits in each lab
- Freezer farm shall have (24) dedicated 20 amp generator power circuits, one every 3 feet along the perimeter wall, and an allocation for some center circuits
- Tank area shall have manifold circuits on generator power and (2) convenience outlets
- Waste area and storage/ice shall have (2) convenience outlets and power for the ice machine
- Corridors shall have convenience outlets every 50 feet
- IT room A shall have 2 quad outlets, four circuits, fed from generator power. IT room B shall have 1 quad outlet, two circuits, fed from generator power.

End of MEP Scope

MORIARTY
50 HAMPSHIRE 8TH FLOOR
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16 ESTIMATE DATED 4-15-16

TRADE	TOTAL JMA 4/25/2016	TOTAL JMA 4/15/2016
TRADES	[redacted]	
DEMO		
CONCRETE		
MASONRY		
STRUCTURAL / MISC IRON		
FINISH CARPENTRY		
ROOFING		
SOFP		
DOORS		
GLASS & GLAZING		
DRYWALL		
PORCELAIN TILE / INTERIOR STONE		
ACT		
EPOXY FLOORING		
CARPET & RESILIENT		
PAINTING		
SPECIALTIES		
EQUIPMENT		
FURNISHINGS / LAB CASEWORK		
HOIST OPERATORS		
FIRE PROTECTION		
PLUMBING		
HVAC		
ATC		
ELECTRICAL		
TEL/DATA - AV - SECURITY		
SUBTOTAL DIRECT COST		
SUBGUARD (1.15%)		
DESIGN CONTINGENCY		
MISC PERMITS & FEES ALLOW		
UTILITY CONSUMPTION ALLOW		
GENERAL CONDITIONS / JOB COSTS		
BUILDING PERMIT (1.5%)		
GL INSURANCE (1.1%)		
CONSTRUCTION CONTINGENCY (3.0%)		
FEE (3.0%)		
GC BOND		
GRAND TOTAL CONSTRUCTION		
	JMA 4/15/16 ESTIMATE	**JMA 4/15/16 ESTIMATE**

50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16 ESTIMATE DATED 4-15-16
VE SCOPE VERSION

AREA STUDY		GSF	28035
8TH FLOOR			
OFFICE		14,100	
LAB		10,200	
CORE SHELL EXISTING		2,220	
	TOTAL	**26,520**	

TRADE	ITEM	QTY	UNIT	U.P.	COST	TOTAL
DEMOLITION						
	MISC RELOCATES / DEMOLITION					
SUBTOTAL DEMOLITION						
CONCRETE						
SUBTOTAL CONCRETE						
MASONRY						
SUBTOTAL MASONRY						
STRUCTURAL / MISC IRON WORK						
	MISC STRUCT / PADS					
	ALLOW FOR BEAM PENS					
SUBTOTAL STRUCTURAL / MISC IRON WORK						
FINISH CARPENTRY:						
	WALL BASE					
	SOLID SURFACE WINDOW SILLS IN LAB					
	SOLID SURFACE WINDOW SILLS IN OFFICE					
	ELEVATOR LOBBY UPGRADE					
	CONFERENCE ROOM MILLWORK					
	CAFE MILLWORK					
	UPPERS					
	LOWERS					
	TOPS					
	ISLAND					
	TOPS					
	OTHER MILLWORK / BUILT-INS					
	COPY ROOM BUILT INS					
	UPPERS / LOWERS					
	TOPS					
	STORAGE ROOM SHELVING					
	PHONE ROOM					
	WELLNESS ROOM TOPS					
	OPEN AREABENCHES					
	FEATURE WALL					
	CONFERENCE / PRIVATE OFFICE MILLWORK					
	LOCKERS					
	RECEPTION DESK					

50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16 ESTIMATE DATED 4-15-16
VE SCOPE VERSION

COAT CLOSETS

SUBTOTAL FINISH CARPENTRY

ROOFING

SUBTOTAL ROOFING

SOFP
FIREPROOFING PATCHING
K13 ACCOUSTIC COLORED SPRAY INSULATION

SUBTOTAL SOFP

DOORS (WOOD WITH HALF LITE)
OFFICE DOORS
LAB SINGLES
LAB DOUBLES/SINGLE AND HALF

CARDREADER HWARDWARE AND POWER SUPPLY

CAPTURED ALUMINUM FRAMING SYSTEM (SIMILAR TO FRAMEWORKS)
CAPTURED ALUMINUM FRAMING SYSTEM LAB TRANSOMS (SIMILAR TO FRAMEWORKS)

SUBTOTAL DOORS

GLASS AND GLAZING
STOREFRONT
AREA

1/4” MAX THICK GLASS IN CAPTURED ALUMINUM FRAMING
1/4” MAX THICK GLASS IN CAPTURED ALUMINUM FRAMING AT LAB TRANSOMS
BUTT GALZED RETURN PIECE AT PHONE /HUDDLE ROOMS

GLASS DOORS
GLASS SLIDERS

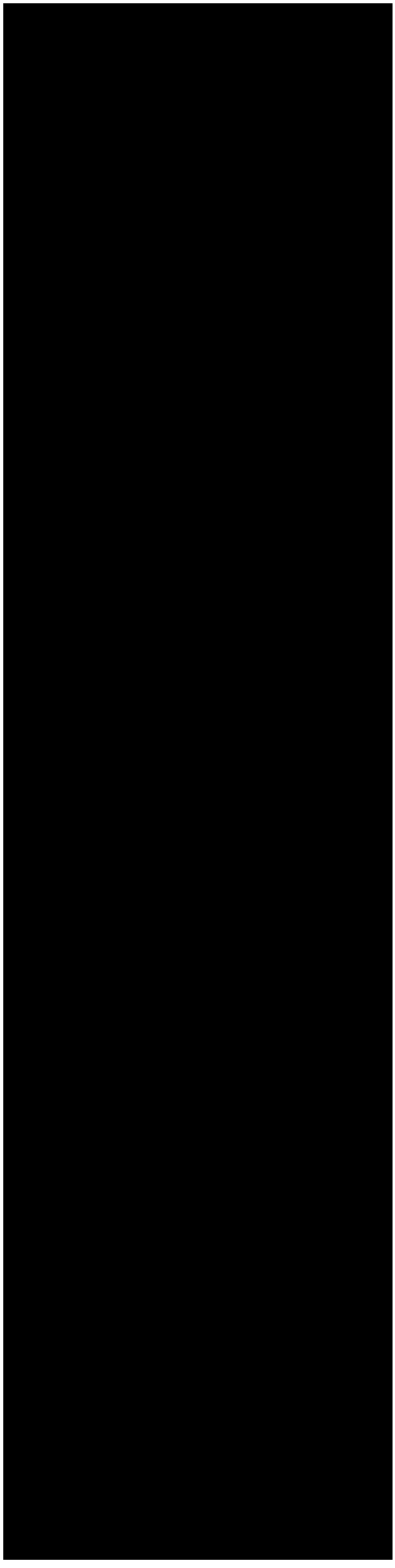
MISC GLAZING
VISION PANELS
HALF
FILM

SUBTOTAL GLASS AND GLAZING

DRYWALL
PARTITIONS
EXTERIOR WALL
ABOVE AND BELOW PUNCH WINDOWS
FURRING WALL BETWEEN WINDOWS
COLUMN ENCASEMENTS
GFRG
FULL HGT WALLS 6 “ ABOVE FIN CEILING
SHAFT WALLS 5% NOT SHOWN
ABOVE RACO FRAMING
ALT TO FULL HGT ILO OF ABOVE
BLOCKING
MISC. BLOCKING
PLYWOOD WALLS AT TELEDATA
BLOCKING AT PHONE ROOMS / OFFICES
BLOCKING AT KITCHENS
BLOCKING AT PLUMBING WALL OUTLETS
BLOCKING AT CONFERENCE ROOMS
BLOCKING AT LAB WALL SHELVING

LEVEL 5 FINISH AT IDEA PAINT AND FELZ

CEILINGS SOFFITS
CEILINGS
AT LAB ROOMS W/EPOXY FLOORS
AT ELEVATOR LOBBIES



50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16 ESTIMATE DATED 4-15-16
VE SCOPE VERSION

[redacted]

AT CAFÉ SPACE

SOFFITS AT ACT TRANSITIONS
SOFFITS AT EXTERIOR WALL
SOFFITS AT TRANSITION TO OPEN CEILING AREA
RECESSED POCKET FOR MECHOSHADES

MISC
CUT AND PATCH EXISTING SHAFT WALLS
INSTALL RECESSED FIRE EXTINGUISHER CABS
INSTALL HM FRAMES
INSTALL CORNER GUARDS
REVEAL/PICTURE FRAME HANGERS

SUBTOTAL DRYWALL

INTERIOR STONE & TILE
AT ELEVATOR LOBBIES
BACKSPLASH AT CAFÉ / KITCHENETTE

HOLD FOR FLOOR PREP
HOLD FOR MOISTURE MITIGATION
HOLD FOR PROTECTION

SUBTOTAL STONE & TILE WORK

ACT
ACT- 2X2 ACOUSTIC TILE AT OFFICE AREAS/LAB AREAS (BLENDED RATE)
ACT -2 X 2 AT LAB AREAS
ACT-3 GASKETED AT TC LAB AND PROCEDURE
ACT 4X4 AT CONFERENCE ROOMS

HOLD FOR TRANSITIONS/TRIM/CUT AROUND DIFFUSERS, ETC
HOLD FOR PATCH / COME-BACK FOR MEP TRADES

SUBTOTAL ACT

EPOXY FLOORING
EPOXY BASE
EPOXY FLOORS PER AST LEGEND

SUBTOTAL EPOXY FLOORING

RESILIENT FLOORING & CARPET
PATTERNED VCT IN LAB AREAS
VINYL BASE
WELDED SEAM VINYL AND BASE AT TC AND PROCEDURE

LUXURY VINYL TILE

CARPET TILE PER PLANS

TRNASITION MATERIALS

HOLD FOR FLOOR PREP
HOLD FOR MOISTURE MITIGATION
HOLD FOR FLOOR PROTECTION

SUBTOTAL RESILIENT FLOORING & CARPET

PAINTING & WALLCOVERING
PAINT WALLS
PAINT CEILINGS
PAINT EXPOSED CEILING AREAS
PAINT SOFFITS
PAINT DOORS & FRAMES
ACCENT COLORS
EPOXY PAINT AT ROOMS WITH VINYL AND EPOXY

CUSTOM WALL COVERING GRAPHICS LARGE WALLS
CUSTOM WALL COVERING GRAPHICS SMALL WALLS
WALL COVERING IN CONFERENCE ROOMS

50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16 ESTIMATE DATED 4-15-16
VE SCOPE VERSION

IDEA PAINT
FELZ PRODUCT

HOLD FOR TOUCHUP
HOLD FOR JOINT SEALERS AT WINDOWS
HOLD FOR WALL PROTECTION

SUBTOTAL PAINTING & WALLCOVERING

SPECIALTIES
SPECIALTIES
FIRE EXTINGUISHERS
LAB ACCESSORIES
SOAP DISPENSERS
PAPER TOWEL DISPENSERS
CORNER GUARDS
BUMPER RAILS
MOTORIZED MOVEABLE WHITEBOARD

ACOUSTIC PANELS
ACOUSTICAL PANELS AT CONF RMS
HOLD FOR PROTECTION

FOLDING PARTITION

WINDOW TREATMENTS
MANUAL MECHOSHADE
PREMIUM FOR BLACKOUT
SHADES IN CONF ROOMS
BAG ,CLEAN AND REUSE EXISTING
PROJECTIONS SCREENS

ALLOW FOR SIGNAGE

SUBTOTAL SPECIALTIES

EQUIPMENT
APPLIANCES:
FULL FRIDGE
UNDERCOUNTER
MICROWAVE
DISHWASHER

DELIVERY / DISTRIBUTION

ENVIRONMENTAL ROOMS

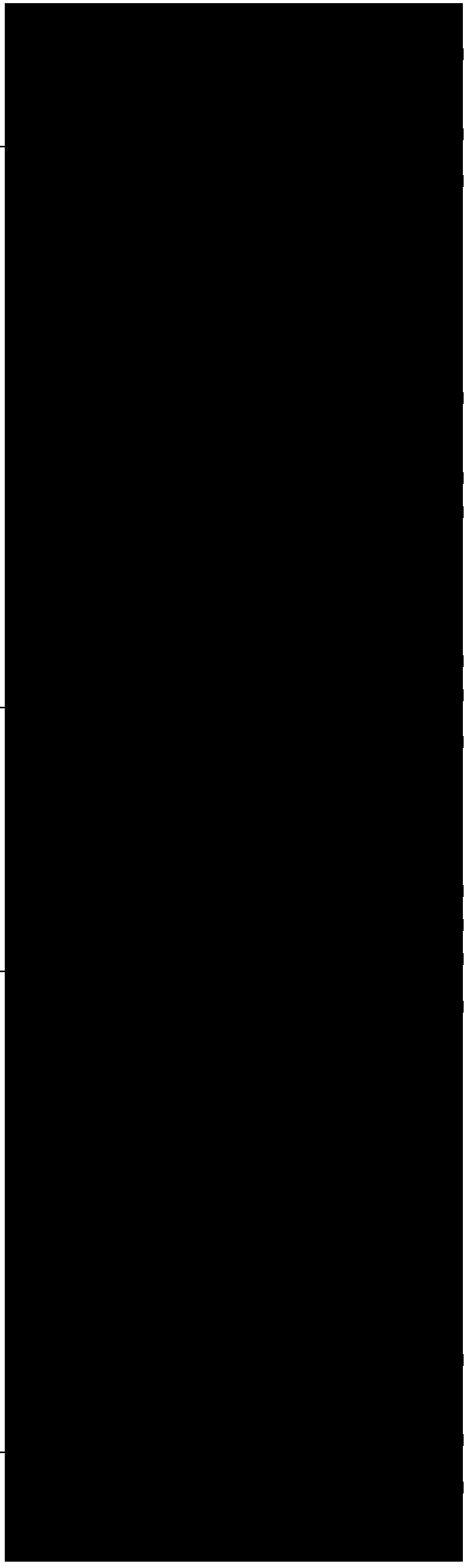
SUBTOTAL EQUIPMENT

LAB CASEWORK
LABORATORY
6’ MOBILE ADJUSTABLE HEIGHT BENCHES
CORE FRAME
SHELVING
WALL SHELVING (2 ROWS)
CORE SHELVING (2 ROWS)
WALL MOUNTED BENCHES
LAB SINKS
SS HAND SINK
UTILITY ACCESS CHASES
EYEWASH
EMERGENCY SHOWER STATIONS (ES-1)
BIOSAFETY CABINETS
FUME HOODS 5’

OVERHEAD SERVICE PANELS - OSP 1
CP-1
ALLOWANCE FOR CASEWORK NOT SHOWN

SUBTOTAL LAB CASEWORK

HOIST OPERATORS
ELEVATOR OPERATOR (30%)
OT OPERATOR (30%)



50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16 ESTIMATE DATED 4-15-16
VE SCOPE VERSION

[redacted]

SUBTOTAL HOIST OPERATORS

FIRE PROTECTION:
- HEADS
- BRANCH MAINS
- DRAIN DOWNS ASSOCIATED WITH AN OCCUPIED BUILDING

SUBTOTAL FIRE PROTECTION

PLUMBING
- EQUIPMENT
  - WATER HEATERS
  - RODI SKID / DISTRIBUTION
  - DUPLEX LAB VACUUM PUMP SYSTEM
    - MANIFOLD
- DUPLEX LAB AIR COMPRESSOR SYSTEM
    - MANIFOLD
- PH NEUTRALIZATION SYSTEM
- LN TANK AND VAPORIZER
- MANIFOLDS
    - CO2
    - N
- DOMESTIC FIXTURES
  - KITCHENETTE SINKS
  - WELLNESS ROOM SINKS
  - FRIG ICEMAKER CONNECTIONS
  - INSTA HOT WATER HEATERS
- DOMESTIC WET PIPING
  - CW PIPING
  - HW, HWR PIPING
  - SANITARY / VENT TO STACKS
- INSULATION
- LAB FIXTURES
  - FLOOR SINKS
  - EYEWASH
  - EMERGENCY SHOWER
  - HOOKUP TO SINKS BY LAB FURNISHINGS
- PIPING
  - DROPS
    - TYPE 1 OSP
    - TYPE 1 WALL
  - LAB WASTE AND VENT
    - VENT
    - WASTE
    - FIRE WRAP LAB WASTE IN 7TH FLOOR CEILING
    - DRAINS AT ICE MACHINE ROOMS
  - NCW PIPING DISTRIBUTION
  - NHW&R PIPING DISTRIBUTION
  - FILTER AT ICE MACHINE ROOM
  - TEMPERED WATER S&R DISTRIBUTION
  - RODI S&R PIPING DISTRIBUTION
    - CONNECTIONS TO POLISHERS
  - COMPRESSED AIR PIPING DISTRIBUTION
    - DROPS
  - CO2 PIPING DISTRIBUTION
    - DROPS TO INC
  - VAC PIPING DISTRIBUTION
    - DROPS TO BSC
  - N PIPING DISTRIBUTION
  - QUICK DISCONNECTS AT OVERHEAD PANELS
  - PIPING TO WALL OUTLETS
- INSULATION FOR LAB PIPING
- MISCELLANEOUS
  - ATLAS RO DRINKING WATER
  - COORDINATION / DRAWINGS
  - STARTUP / COMMISSIONING

RIGGING

SUBTOTAL PLUMBING - [redacted]

50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16
ESTIMATE DATED 4-15-16
VE SCOPE VERSION

HVAC

- EQUIPMENT
  - EXHAUST VAVS W/OUT COILS
  - LAB SAV W/ HW COILS
  - FCU COOLING ONLY CASSETTE TYPE
  - 3 TON SPLIT SYSTEM AT FREEZER FARMS
  - 2 TON SPLIT SYSTEM AT IDF ROOMS
  - 500 CFM BOX FAN DUCTED TO PLENUM AT IT ROOM
  - VENTURI BOX
  - HUMIDIFIERS
  - VAVS WITH COILS
  - VAVS WITH NO COILS
  - FPT W/ HW COILS
  - FIN TUBE RADIATION
  - HEAT PUMPS
- DUCTWORK & DISTRIBUTION
  - SPECIALTY EXHAUSTS
  - SUPPLY DUCT
    - SS PREMIUM
  - EXHAUST DUCT
  - MECHANICAL / SHEETMETAL PERMIT
  - INSULATION
- R/G/D'S
  - LINEAR DIFFUSERS
  - STANDARD CEILING DIFFUSERS
  - EXHAUST GRILLES
  - FUME HOOD CONNECTIONS
  - LAB EXHAUST PORTS
- PIPING / VALVES
  - HOT WATER
    - SUPPLY / RETURN
      - HWSR LOOP
      - FIN TUBE / TERMINAL BOX CONN.
  - CHILLED WATER
    - SUPPLY / RETURN
      - CHWSR LOOP
      - FIN TUBE / TERMINAL BOX CONN.
    - INSULATION
      - LARGE
      - TYPICAL
  - CITY WATER
  - STEAM
  - CONDENSER WATER
    - INSULATION
  - CONDENSATE DRAIN
    - INSULATION
- MISCELLANEOUS
  - REBALANCE AND OTHER CORE/SHELL TI RELATED MODS
  - FILTER CHANGES (LEED)
  - FIREWATCHES
  - ENGINEERING/DRAWINGS/COORDINATION
  - BALANCING G/R/D'S
  - RIGGING
  - START-UP / COMMISSIONING
- SUBCONTRACTOR MARKUP

[redacted]

SUBTOTAL HVAC

ATC

- FUME HOODS
- FPT/VAV BOXES W/ REHEAT
- VAV COOLING ONLY
- EVAV
- FIN TUBE
- O2 DEPLETION

50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16
ESTIMATE DATED 4-15-16
VE SCOPE VERSION

AIR FLOW STATIONS
COMBO FLOW STATIONS
WATER FLOW METERS
FCUS
SPLIT SYSTEMS
LIGHTING INTERFACE WORK
ELECTRICAL METER INTEGRATION
MISC INFRASTUCTURE
FULL TIME PM
PLUMBING FLOW METERS
ALARM POINTS
SUB MARKUP ON CONTROLS

SUBTOTAL ATC

ELECTRICAL

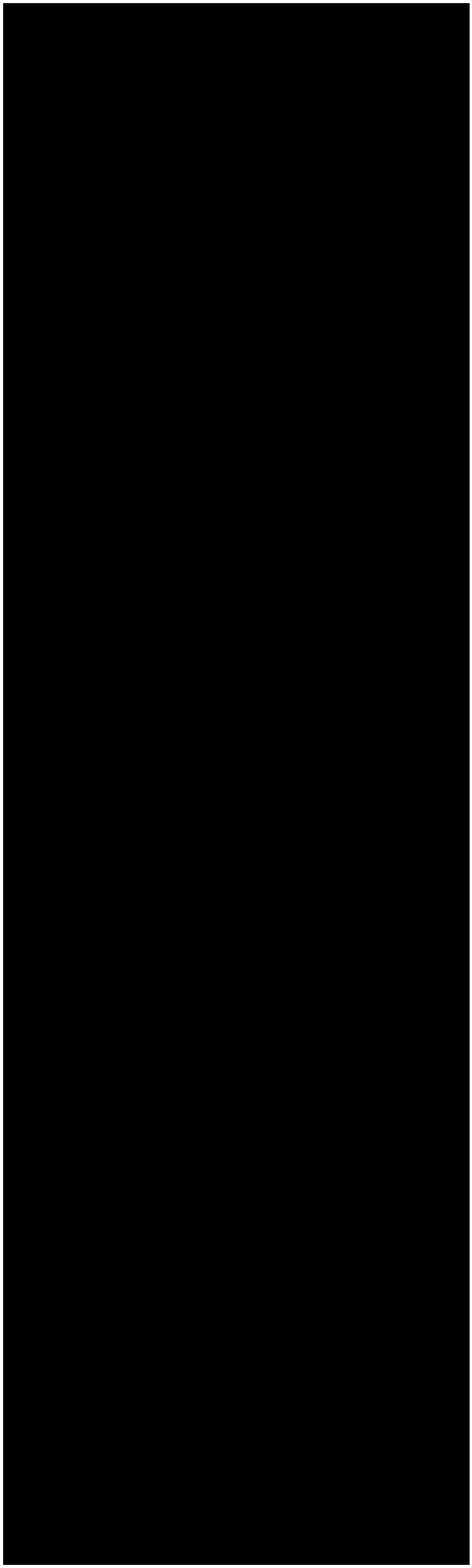
NORMAL POWER DISTRIBUTION
- BUS TAPS
- DRY TYPE TRANSFORMERS
  - SMALL
  - LARGE
- SWITCHBOARDS
- DISTRIBUTION PANELS
- HV PANEL
- LV PANELS IN SPACE
- FEEDERS IN CLOSET
- FEEDS TO LAB FLR PANELS

OPTIONAL STANDBY POWER
- FEEDER TO GENSET GEAR
- PANELS
- SWITCHBOARDS
  - DISTRIBUTION
  - HIGH VOLTAGE
  - LOW VOLTAGE
  - TRANSFORMERS
- FEEDERS
  - FEEDS TO LAB FLR PANELS

LIGHTING
- LIGHTING IN OFFICE AREA
- LIGHTING IN LAB AREA
- SPECIALTY LIGHTING IN CONF ,HUDDLE ETC PER NOTES
- SPECIALTY LARGE PENDANTS
- SPECAILTY SMALL PENDANTS
- target discount on lighting packge

LIGHTING CONTROLS
- HEAD END
- OCCUPANCY SENSORS
- OTHER CONTROLLERS

POWER
- DEDICATED POWER IN TEL/DATA CLOSETS
- GFI OUTLETS
- DUPLEX OUTLETS
- DOUBLE DUPLEX OUTLETS
- FURNITURE FEEDS
- FLOOR BOXES
- POKE THRUS
- OSP (2 DEDICATED OUTLETS EACH)
- OSP BRANCH CIRCUITS
- WIRE MOLD
- EXTERIOR LAB WALL OUTLETS
- TISSUE CULTURE BSC OUTLETS
- TC INCUBATOR OUTLETS ON E POWER
- TC MISC OUTLETS
- TBD , FLOW , MICROS ETC ROOMS OUTLETS
- FREEZER FARM OUTLETS



TANK AREA OUTLETS
WASTE AREA AND STORAGE
PREMIUM FOR DECIACTED CIRCUITS
CORRDIOR OUTLETS

[redacted]

50 HAMPSHIRE
BIOMED REALTY
BASED ON ARROWSTREET DRAWINGS A2.01,A2.20 ,A5.01 DATED 4/6/16 AND AHA MEMO REVISED 4/13/16
ESTIMATE DATED 4-15-16
VE SCOPE VERSION

MECHANICAL & EQUIPMENT WIRING
- HVAC BOXES/EXHAUST FCU'S
- DISHWASHER CONNECTIONS
- FCU
- SPLIT SYSTEMS
- PH NEUTRALIZATION SYSTEMS
- POWER HVAC CONTROLS EQUIPMENT
- FUME HOOD CONNECTIONS
  - EXPLOSION PROOF FUME HOOD CONNECTIONS
- WIRE COLD / ENVIRONMENTAL ROOMS
- LAB EQUIPMENT

FIRE ALARM
- TEMP HEAT DETECTORS ILO SPRINKLERS IN OCC BLDG

RACEWAY
- TEL/DATA
  - CABLE TRAY
- A/V IN-ROOM RACEWAY
- SECURITY RACEWAY

MISC
- COORDINATION DRAWINGS
- PERMIT
- COMMISSIONING
- HOLD FOR TEMP LIGHTS, LIFE SAFETY

SUBCONTRACTOR MARKUP

[redacted]

SUBTOTAL ELECTRICAL

TEL/DATA
- TEL/DATA WIRING ALLOWANCE

SUBTOTAL TEL/DATA

AUDIO VISUAL WIRING / EQUIPMENT
- AUDIO/VIDEO ALLOWANCE

SUBTOTAL AUDIO VISUAL WIRING / EQUIPMENT

SECURITY
- ALLOWANCE

SUBTOTAL SECURITY

SUBTOTAL DIRECT COSTS

Attachment 3 to Work Letter

Budget

[See attached]

BioMed Realty Trust

50 Hampshire Street

Surface - Conceptual Development Budget

5/2/16

50 Hampshire Street -Surface **32,018 rsf**

TI|HARD COST

Hard Cost | CM Estimate

Hard Cost Contingency

SUB-TOTAL - TI HARD COST

TI|SOFT COST

Design Fees

Design Reimbursables

Building Shutdown Fees

Commissioning

Soft Cost Contingency

Development Fee

SUB-TOTAL - TI SOFT COST

TOTAL PROJECT COST

TENANT IMPROVEMENT ALLOWANCE

EXCESS TENANT IMPROVEMENT

[redacted]

EXHIBIT B-1

TENANT WORK INSURANCE SCHEDULE

Tenant shall be responsible for requiring all of Tenant contractors doing construction or renovation work to purchase and maintain such insurance as shall protect it from the claims set forth below which may arise out of or result from any Tenant Work whether such Tenant Work is completed by Tenant or by any Tenant contractors or by any person directly or indirectly employed by Tenant or any Tenant contractors, or by any person for whose acts Tenant or any Tenant contractors may be liable:

1. Claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Tenant Work to be performed.

2. Claims for damages because of bodily injury, occupational sickness or disease, or death of employees under any applicable employer's liability law.

3. Claims for damages because of bodily injury, or death of any person other than Tenant's or any Tenant contractors' employees.

4. Claims for damages insured by usual personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by Tenant or any Tenant contractors or (b) by any other person.

5. Claims for damages, other than to the Tenant Work itself, because of injury to or destruction of tangible property, including loss of use therefrom.

6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

Tenant contractors' Commercial General Liability Insurance shall include premises/operations (including explosion, collapse and underground coverage if such Tenant Work involves any underground work), elevators, independent contractors, products and completed operations, and blanket contractual liability on all written contracts, all including broad form property damage coverage.

Tenant contractors' Commercial General, Automobile, Employers and Umbrella Liability Insurance shall be written for not less than limits of liability as follows:

a. Commercial General Liability: Bodily Injury and Property Damage	Commercially reasonable amounts, but in any event no less than $1,000,000 per occurrence and $2,000,000 general aggregate, with $2,000,000 products and completed operations aggregate.

b. Commercial Automobile Liability: Bodily Injury and Property Damage	$1,000,000 per accident
c. Employer's Liability:	
Each Accident	$500,000
Disease – Policy Limit	$500,000
Disease – Each Employee	$500,000
d. Umbrella Liability: Bodily Injury and Property Damage	Commercially reasonable amounts (excess of coverages a, b and c above), but in any event no less than $5,000,000 per occurrence / aggregate.

All subcontractors for Tenant contractors shall carry the same coverages and limits as specified above, unless different limits are reasonably approved by Landlord. The foregoing policies shall contain a provision that coverages afforded under the policies shall not be canceled or not renewed until at least thirty (30) days' prior written notice has been given to the Landlord. Certificates of insurance including required endorsements showing such coverages to be in force shall be filed with Landlord prior to the commencement of any Tenant Work and prior to each renewal. Coverage for completed operations must be maintained for the lesser of ten (10) years and the applicable statue of repose following completion of the Tenant Work, and certificates evidencing this coverage must be provided to Landlord. The minimum A.M. Best's rating of each insurer shall be A- VII. Landlord and its mortgagees shall be named as an additional insureds under Tenant contractors' Commercial General Liability, Commercial Automobile Liability and Umbrella Liability Insurance policies as respects liability arising from work or operations performed, or ownership, maintenance or use of autos, by or on behalf of such contractors. Each contractor and its insurers shall provide waivers of subrogation with respect to any claims covered or that should have been covered by valid and collectible insurance, including any deductibles or self-insurance maintained thereunder.

Such coverage shall include bodily injury, sickness, disease, death or mental anguish or shock sustained by any person; property damage, including physical injury to or destruction of tangible property (including the resulting loss of use thereof), clean-up costs and the loss of use of tangible property that has not been physically injured or destroyed; and defense costs, charges and expenses incurred in the investigation, adjustment or defense of claims for such damages. Coverage shall apply to both sudden and non-sudden pollution conditions including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water. Claims-made coverage is permitted, provided the policy retroactive date is continuously maintained prior to the Term Commencement Date, and coverage is continuously maintained during all periods in which Tenant occupies the Premises. Coverage shall be maintained with limits of not less than $1,000,000 per incident with a $2,000,000 policy aggregate.

EXHIBIT B-2

LANDLORD'S WORK

- (1) 100% Outside Air (OA) Air Handling Unit (AHU)
- (1) Air Cooled Water Chiller
- (2) Boilers
- (1) Tenant Generator for Stand-By Power
- (1) Central Lab Exhaust with Heat Recovery
- Base Building Shared Lab Services:
    - R.O. Tank and vertical distribution
    - Lab Waste pH Tank and vertical distribution
    - Compressed Air
    - Central Vacuum
    - Chemical Storage
    - Lab Waste Storage

EXHIBIT C

ACKNOWLEDGEMENT OF TERM COMMENCEMENT DATE AND TERM EXPIRATION DATE

THIS ACKNOWLEDGEMENT OF TERM COMMENCEMENT DATE AND TERM EXPIRATION DATE is entered into as of [ ], 20[ ], with reference to that certain Lease (the "Lease") dated as of [ ], 20[ ], by SURFACE ONCOLOGY, INC., a Delaware corporation ("Tenant"), in favor of BMR-HAMPSHIRE LLC, a Delaware limited liability company ("Landlord"). All capitalized terms used herein without definition shall have the meanings ascribed to them in the Lease.

Tenant hereby confirms the following:

1. Tenant accepted possession of the Premises for use in accordance with the Permitted Use on [ ], 20[ ]. Tenant first occupied the Premises for the Permitted Use on [ ], 20[ ].

2. The Premises are in good order, condition and repair.

3. The Tenant Improvements are Substantially Complete.

4. All conditions of the Lease to be performed by Landlord as a condition to the full effectiveness of the Lease have been satisfied, and Landlord has fulfilled all of its duties in the nature of inducements offered to Tenant to lease the Premises.

5. In accordance with the provisions of Article 4 of the Lease, the Term Commencement Date is [ ], 20[ ], and, unless the Lease is terminated prior to the Term Expiration Date pursuant to its terms, the Term Expiration Date shall be [ ], 20[ ].

6. The Lease is in full force and effect, and the same represents the entire agreement between Landlord and Tenant concerning the Premises[, except [ ]].

7. Tenant has no existing defenses against the enforcement of the Lease by Landlord, and there exist no offsets or credits against Rent owed or to be owed by Tenant.

8. The obligation to pay Rent is presently in effect and all Rent obligations on the part of Tenant under the Lease commenced to accrue on [ ], 20[ ], with Base Rent payable on the dates and amounts set forth in the chart below:

Dates	Approximate Square Feet of Rentable Area	Base Rent per Square Foot of Rentable Area	Monthly Base Rent	Annual Base Rent
[ ]/[ ]/[ ]- [ ]/[ ]/[ ]	32,018	[redacted]		

9. The undersigned Tenant has not made any prior assignment, transfer, hypothecation or pledge of the Lease or of the rents thereunder or sublease of the Premises or any portion thereof.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, Tenant has executed this Acknowledgment of Term Commencement Date and Term Expiration Date as of the date first written above.

TENANT:

SURFACE ONCOLOGY, INC.,
a Delaware corporation

By: _____
Name: _____
Title: _____

EXHIBIT D

PLAN OF LAB AND OFFICE ZONES

[See Attached]


OFFICE
SUITE 810
LAB SUPPORT
LAB
SUITE 820
OFFICE
LAB SUPPORT
LAB

EXHIBIT E

FORM OF LETTER OF CREDIT

[On letterhead or L/C letterhead of Issuer]

LETTER OF CREDIT

Date: _____, 20____

_____(the "Beneficiary")
Attention: _____
L/C. No.: _____
Loan No. : _____

Ladies and Gentlemen:

We establish in favor of Beneficiary our irrevocable and unconditional Letter of Credit numbered as identified above (the "L/C") for an aggregate amount of $, expiring at :00 p.m. on or, if such day is not a Banking Day, then the next succeeding Banking Day (such date, as extended from time to time, the "Expiry Date"). "Banking Day" means a weekday except a weekday when commercial banks in are authorized or required to close.

We authorize Beneficiary to draw on us (the "Issuer") for the account of (the "Account Party"), under the terms and conditions of this L/C.

Funds under this L/C are available by presenting the following documentation (the "Drawing Documentation"): (a) the original L/C and (b) a sight draft substantially in the form of Attachment 1, with blanks filled in and bracketed items provided as appropriate. No other evidence of authority, certificate, or documentation is required.

Drawing Documentation must be presented at Issuer's office at on or before the Expiry Date by personal presentation, courier or messenger service, or fax. Presentation by fax shall be effective upon electronic confirmation of transmission as evidenced by a printed report from the sender's fax machine. After any fax presentation, but not as a condition to its effectiveness, Beneficiary shall with reasonable promptness deliver the original Drawing Documentation by any other means. Issuer will on request issue a receipt for Drawing Documentation.

We agree, irrevocably, and irrespective of any claim by any other person, to honor drafts drawn under and in conformity with this L/C, within the maximum amount of this L/C, presented to us on or before the Expiry Date, provided we also receive (on or before the Expiry Date) any other Drawing Documentation this L/C requires.

We shall pay this L/C only from our own funds by check or wire transfer, in compliance with the Drawing Documentation.

If Beneficiary presents proper Drawing Documentation to us on or before the Expiry Date, then we shall pay under this L/C at or before the following time (the "Payment Deadline"): (a) if presentment is made at or before noon of any Banking Day, then the close of such Banking Day; and (b) otherwise, the close of the next Banking Day. We waive any right to delay payment beyond the Payment Deadline. If we determine that Drawing Documentation is not proper, then we shall so advise Beneficiary in writing, specifying all grounds for our determination, within one Banking Day after the Payment Deadline.

Partial drawings are permitted. This L/C shall, except to the extent reduced thereby, survive any partial drawings.

We shall have no duty or right to inquire into the validity of or basis for any draw under this L/C or any Drawing Documentation. We waive any defense based on fraud or any claim of fraud.

The Expiry Date shall automatically be extended by one year (but never beyond (the "Outside Date")) unless, on or before the date 90 days before any Expiry Date, we have given Beneficiary notice that the Expiry Date shall not be so extended (a "Nonrenewal Notice"). We shall promptly upon request confirm any extension of the Expiry Date under the preceding sentence by issuing an amendment to this L/C, but such an amendment is not required for the extension to be effective. We need not give any notice of the Outside Date.

Beneficiary may from time to time without charge transfer this L/C, in whole but not in part, to any transferee (the "Transferee"). Issuer shall look solely to Account Party for payment of any fee for any transfer of this L/C. Such payment is not a condition to any such transfer. Beneficiary or Transferee shall consummate such transfer by delivering to Issuer the original of this L/C and a Transfer Notice substantially in the form of Attachment 2, purportedly signed by Beneficiary, and designating Transferee. Issuer shall promptly reissue or amend this L/C in favor of Transferee as Beneficiary. Upon any transfer, all references to Beneficiary shall automatically refer to Transferee, who may then exercise all rights of Beneficiary. Issuer expressly consents to any transfers made from time to time in compliance with this paragraph.

Any notice to Beneficiary shall be in writing and delivered by hand with receipt acknowledged or by overnight delivery service such as FedEx (with proof of delivery) at the above address, or such other address as Beneficiary may specify by written notice to Issuer. A copy of any such notice shall also be delivered, as a condition to the effectiveness of such notice, to: _____ (or such replacement as Beneficiary designates from time to time by written notice).

No amendment that adversely affects Beneficiary shall be effective without Beneficiary's written consent.

This L/C is subject to and incorporates by reference: (a) the International Standby Practices 98 ("ISP 98"); and (b) to the extent not inconsistent with ISP 98, Article 5 of the Uniform Commercial Code of the State of New York.

Very truly yours,

[Issuer Signature]

ATTACHMENT 1 TO EXHIBIT E

FORM OF SIGHT DRAFT

[BENEFICIARY LETTERHEAD]

TO:

[Name and Address of Issuer]

SIGHT DRAFT

AT SIGHT, pay to the Order of , the sum of United States Dollars ($). Drawn under [Issuer] Letter of Credit No. dated .

[Issuer is hereby directed to pay the proceeds of this Sight Draft solely to the following account: .]

[Name and signature block, with signature or purported signature of Beneficiary]

Date:

ATTACHMENT 2 TO EXHIBIT E

FORM OF TRANSFER NOTICE

[BENEFICIARY LETTERHEAD]

TO:

[Name and Address of Issuer] (the "Issuer")

TRANSFER NOTICE

By signing below, the undersigned, Beneficiary (the "Beneficiary") under Issuer's Letter of Credit No. dated (the "L/C"), transfers the L/C to the following transferee (the "Transferee"):

[Transferee Name and Address]

The original L/C is enclosed. Beneficiary directs Issuer to reissue or amend the L/C in favor of Transferee as Beneficiary. Beneficiary represents and warrants that Beneficiary has not transferred, assigned, or encumbered the L/C or any interest in the L/C, which transfer, assignment, or encumbrance remains in effect.

[Name and signature block, with signature or purported signature of Beneficiary]

Date:]

EXHIBIT F

RULES AND REGULATIONS

NOTHING IN THESE RULES AND REGULATIONS ("RULES AND REGULATIONS") SHALL SUPPLANT ANY PROVISION OF THE LEASE. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THESE RULES AND REGULATIONS AND THE LEASE, THE LEASE SHALL PREVAIL.

1. No Tenant Party shall encumber or obstruct the common entrances, lobbies, elevators, sidewalks and stairways of the Building(s) or the Project or use them for any purposes other than ingress or egress to and from the Building(s) or the Project.

2. Except as specifically provided in the Lease, no sign, placard, picture, advertisement, name or notice shall be installed or displayed on any part of the outside of the Premises or the Building(s) without Landlord's prior written consent. Landlord shall have the right to remove, at Tenant's sole cost and expense and without notice, any sign installed or displayed in violation of this rule.

3. If Landlord objects in writing to any curtains, blinds, shades, screens, hanging plants or other similar objects attached to or used in connection with any window or door of the Premises or placed on any windowsill, and (a) such window, door or windowsill is visible from the exterior of the Premises and (b) such curtain, blind, shade, screen, hanging plant or other object is not included in plans approved by Landlord, then Tenant shall promptly remove such curtains, blinds, shades, screens, hanging plants or other similar objects at its sole cost and expense.

4. Deliveries shall be made no earlier than 7 a.m. and no later than 6 p.m. and are subject to local municipal noise ordinances. No deliveries shall be made that impede or interfere with other tenants in or the operation of the Project. Movement of furniture, office equipment or any other large or bulky material(s) through the Common Area shall be restricted to such hours as Landlord may designate and shall be subject to reasonable restrictions that Landlord may impose

5. Tenant shall not place a load upon any floor of the Premises that exceeds the load per square foot that (a) such floor was designed to carry or (b) is allowed by Applicable Laws. Fixtures and equipment that cause noises or vibrations that may be transmitted to the structure of the Building(s) to such a degree as to be objectionable to other tenants shall be placed and maintained by Tenant, at Tenant's sole cost and expense, on vibration eliminators or other devices sufficient to eliminate such noises and vibrations to levels reasonably acceptable to Landlord and the affected tenants of the Project.

6. Tenant shall not use any method of HVAC other than that approved in writing by Landlord or present at the Project and serving the Premises as of the Execution Date.

7. Tenant shall not install any radio, television or other antennae; cell or other communications equipment; or other devices on the roof or exterior walls of the Premises except in accordance with the Lease. Tenant shall not interfere with radio, television or other digital or electronic communications at the Project or elsewhere.

8. Canvassing, peddling, soliciting and distributing handbills or any other written material within, on or around the Project (other than within the Premises) are prohibited. Tenant shall cooperate with Landlord to prevent such activities by any Tenant Party.

9. Tenant shall store all of its trash, garbage and Hazardous Materials in receptacles within its Premises or in receptacles designated by Landlord outside of the Premises. Tenant shall not place in any such receptacle any material that cannot be disposed of in the ordinary and customary manner of trash, garbage and Hazardous Materials disposal. Any Hazardous Materials transported through Common Area shall be held in secondary containment devices. Tenant shall be responsible, at its sole cost and expense, for Tenant's removal of its trash, garbage and Hazardous Materials. Tenant is encouraged to participate in the waste removal and recycling program in place at the Project.

10. The Premises shall not be used for lodging or for any improper, immoral or objectionable purpose. No cooking shall be done or permitted in the Premises; provided, however, that Tenant may use (a) equipment approved in accordance with the requirements of insurance policies that Landlord or Tenant is required to purchase and maintain pursuant to the Lease for brewing coffee, tea, hot chocolate and similar beverages, (b) microwave ovens for employees' use and (c) equipment shown on plans approved by Landlord; provided, further, that any such equipment and microwave ovens are used in accordance with Applicable Laws.

11. Tenant shall not, without Landlord's prior written consent, use the name of the Project, if any, in connection with or in promoting or advertising Tenant's business except as Tenant's address.

12. Tenant shall comply with all safety, fire protection and evacuation procedures and regulations established by Landlord or any Governmental Authority.

13. Tenant assumes any and all responsibility for protecting the Premises from theft, robbery and pilferage, which responsibility includes keeping doors locked and other means of entry to the Premises closed.

14. Tenant shall not modify any locks to the Premises without Landlord's prior written consent, which consent Landlord shall not unreasonably withhold, condition or delay. Tenant shall furnish Landlord with copies of keys, pass cards or similar devices for locks to the Premises.

15. Tenant shall cooperate and participate in all reasonable security programs affecting the Premises.

16. Tenant shall not permit any animals in the Project, other than for service animals or for use in laboratory experiments.

17. Bicycles shall not be taken into the Building(s) (including the elevators and stairways of the Building) except into areas designated by Landlord.

18. The water and wash closets and other plumbing fixtures shall not be used for any purposes other than those for which they were constructed, and no sweepings, rubbish, rags or other substances shall be deposited therein.

19. Discharge of industrial sewage shall only be permitted if Tenant, at its sole expense, first obtains all necessary permits and licenses therefor from all applicable Governmental Authorities.

20. Smoking is prohibited at the Project.

21. The Project's hours of operation are currently 24 hours a day, seven days a week, except that the Fitness Center is available for use by authorized employees of Tenant between the hours of 5:00 am and 8:00 pm, Monday through Friday (excluding any non-business days that fall during such 5-day period).

22. Tenant shall comply with all orders, requirements and conditions now or hereafter imposed by Applicable Laws or Landlord ("Waste Regulations") regarding the collection, sorting, separation and recycling of waste products, garbage, refuse and trash generated by Tenant (collectively, "Waste Products"), including (without limitation) the separation of Waste Products into receptacles reasonably approved by Landlord and the removal of such receptacles in accordance with any collection schedules prescribed by Waste Regulations.

23. Tenant, at Tenant's sole cost and expense, shall cause the Premises to be exterminated on a monthly basis to Landlord's reasonable satisfaction and shall cause all portions of the Premises used for the storage, preparation, service or consumption of food or beverages to be cleaned daily in a manner reasonably satisfactory to Landlord, and to be treated against infestation by insects, rodents and other vermin and pests whenever there is evidence of any infestation. Tenant shall not permit any person to enter the Premises or the Project for the purpose of providing such extermination services, unless such persons have been approved by Landlord. If requested by Landlord, Tenant shall, at Tenant's sole cost and expense, store any refuse generated in the Premises by the consumption of food or beverages in a cold box or similar facility.

24. If Tenant desires to use any portion of the Common Area for a Tenant-related event, Tenant must notify Landlord in writing at least thirty (30) days prior to such event on the form attached as Attachment 1 to this Exhibit, which use shall be subject to Landlord's prior written consent, not to be unreasonably withheld, conditioned or delayed. Notwithstanding anything in this Lease or the completed and executed Attachment to the contrary, Tenant shall be solely responsible for setting up and taking down any equipment or other materials required for the event, and shall promptly pick up any litter and report any property damage to Landlord related to the event. Any use of the Common Area pursuant to this Section shall be subject to the provisions of Article 28 of the Lease.

Landlord may waive any one or more of these Rules and Regulations for the benefit of Tenant or any other tenant, but no such waiver by Landlord shall be construed as a waiver of such Rules and Regulations in favor of Tenant or any other tenant, nor prevent Landlord from thereafter enforcing any such Rules and Regulations against any or all of the tenants of the Project, including Tenant. These Rules and Regulations are in addition to, and shall not be

construed to in any way modify or amend, in whole or in part, the terms covenants, agreements and conditions of the Lease. Landlord reserves the right to make such other and reasonable additional rules and regulations as, in its judgment, may from time to time be needed for safety and security, the care and cleanliness of the Project, or the preservation of good order therein; provided, however, that Tenant shall not be obligated to adhere to such additional rules or regulations until Landlord has provided Tenant with written notice thereof. Tenant agrees to abide by these Rules and Regulations and any such additional rules and regulations issued or adopted by Landlord. Tenant shall be responsible for the observance of these Rules and Regulations by all Tenant Parties.

ATTACHMENT 1 TO EXHIBIT F

REQUEST FOR USE OF COMMON AREA

REQUEST FOR USE OF COMMON AREA

Date of Request: _____

Landlord/Owner: _____

Tenant/Requestor: _____

Property Location: _____

Event Description: _____

_____

_____

Proposed Plan for Security & Cleaning: _____

_____

_____

Date of Event: _____

Hours of Event: (to include set-up and take down): _____

Location at Property (see attached map): _____

Number of Attendees: _____

Open to the Public? [ ] YES [ ] NO

Food and/or Beverages? [ ] YES [ ] NO

If YES:

- Will food be prepared on site? [ ] YES [ ] NO
- Please describe: _____
- Will alcohol be served? [ ] YES [ ] NO
- Please describe: _____
- Will attendees be charged for alcohol? [ ] YES [ ] NO

- Is alcohol license or permit required? [ ] YES [ ] NO
- Does caterer have alcohol license or permit: [ ] YES [ ] NO [ ] N/A

Other Amenities (tent, booths, band, food trucks, bounce house, etc.): _____

_____

_____

Other Event Details or Special Circumstances: _____

_____

_____

_____

_____

The undersigned certifies that the foregoing is true, accurate and complete and he/she is duly authorized to sign and submit this request on behalf of the Tenant/Requestor named above.

[*INSERT NAME OF TENANT/REQUESTOR*]

By: _____
Name: _____
Title: _____
Date: _____

EXHIBIT G

PTDM

[See attached]

RECEIVED
THE BULFINCH COMPANIES
2001 DEC 18 P 1:42

CITY OF CAMBRIDGE · EXECUTIVE DEPARTMENT

Robert W. Healy, City Manager *Richard C. Rossi, Deputy City Manager*

PTDM Ordinance – AMENDMENT – FINAL DECISION

Project: 50 Hampshire Street (also known as 205 Broadway)

Project Number: F-9

Applicant: Bulfinch Companies, Inc.

Contact: Robert Schlager

Address: First Needham Place, 250 First Avenue, Suite 200, Needham, MA 02194

Date of Application: 10/23/01

Decision Deadline: 12/26/01

Date of Issue: 12/14/01

This form indicates the FINAL decision of the Parking and Transportation Demand Management Planning Officer with respect to the PTDM plan submitted for the project listed above. Please review the enclosed attachments, which include information about ongoing monitoring and reporting relative to this project.

Decision:

☐ Approve (attachment: approval letter and copy of plan)

☒ Approve with Conditions (attachment: letter of conditions and copy of plan)

☐ Deny (attachment: reason for denial and copy of plan)

/s/ Catherine E. Preston

Catherine E. Preston, AICP
PTDM Planning Officer

CITY OF CAMBRIDGE · EXECUTIVE DEPARTMENT

Robert W. Healy, City Manager *Richard C. Rossi, Deputy City Manager*

December 14, 2001

Robert Schlager
Bulfinch Companies, Inc.
First Needham Place, 250 First Avenue, Suite 200
Needham, MA 02194

Dear Mr. Schlager:

The attached form indicates my final decision on the Parking and Transportation Demand Management plan that was submitted for the project located at 205 Broadway, a/k/a 50-60 Hampshire Street. The final decision is an approval with conditions, reflecting changes that must be made to your plan. This letter spells out the conditions that are placed on your plan, as well as recommendations for additional TDM programs that will further improve your non-SOV mode split.

The TDM program for 50-60 Hampshire Street includes a meaningful set of measures to encourage the use of non-Single Occupant Vehicle modes, the results of which have already been seen in monitoring. You are to be commended for the steps you have already taken to limit SOV trips to this site. By incorporating all tenants into the PTDM plan, you have further illustrated your commitment to successful and effective implementation of these measures, which will help to reduce the site's traffic and air quality impacts.

Plan Conditions

The following conditions are placed on the PTDM plan for 205 Broadway:

Much of the success of the PTDM plan has been attributable to programs implemented by Camp, Dresser and McKee (CDM), the primary tenant in 50 Hampshire Street. In order to ensure that such successes are continued through various tenancies and expanded to include the rest of the tenants in 50 and 60 Hampshire, the owner shall incorporate a full set of PTDM measures into future leases. While the owner is not required to ask current tenants without such lease requirement to implement the same array of measures undertaken by CDM, it is anticipated that, as the leases come up for renewal, all tenants will implement an equally comprehensive program.

- CONDITION: Future leases will include provisions to ensure that a full complement of TDM measures will be implemented such that they are available to employees of all tenants in 50 and 60 Hampshire Street. While details may differ from tenant to tenant, TDM programs under new leases must be equally comprehensive in scope to those described in the approved plan.

Additional Recommendations

In addition to the conditions listed above, I am recommending the implementation of the following additional TDM measures. If the current plan fails to reach the stated mode split goal, implementing these programs will help to achieve that goal.

- Subsidize MBTA passes for on-site employees. These subsidies typically cover at least 50% of the cost of passes, including commuter rail passes.
- Provide financial incentives for those who bike or walk to work.
- Study and/or provide shuttle service, alone or with other area employers, to the Green Line.

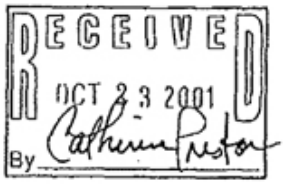
I look forward to continuing to work with you as you implement the elements of this plan and monitor your success. If you have any questions, please feel free to contact me by phone at 617-349-4673 or by email at *cpreston@ci.cambridge.ma.us.*

Sincerely,

/s/ Catherine E. Preston

Catherine E. Preston, AICP
PTDM Planning Officer

cc: Beth Rubenstein, Assistant City Manager for Community Development
SusanneRasmussen, Director of Environmental and Transportation Planning
Susan Clippinger, Director of Traffic, Parking, and Transportation



50 Hampshire Street
Office Development

Cambridge, Massachusetts

Prepared for
BHX, LLC, as sole trustee for 205 Broadway Realty Trust
250 First Avenue, Suite 200
Needham, MA 02194
781 707-4000

Prepared by
VHB/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
101 Walnut Street
P.O. Box 9151
Watertown, Massachusetts 02272
617 924-1770

September 6, 2001

Introduction

This Parking and Transportation Demand Management Plan is a revised version of the original plan submitted by BHX, LLC on June 28, 1999 and accepted by the City of Cambridge on July 2, 1999. Per the comment letter from the City of Cambridge dated November 21, 2000, this revised plan recognizes the other tenants of 50 and 60 Hampshire Street as part of the overall PTDM. commitments and includes measures for these other tenants. Where appropriate, information gathered from the June 2001 PTDM Monitoring Report is included to provide description of the activity at the 50 Hampshire Street garage.

This revised Parking and Transportation Demand Management Plan has been prepared in accordance with the Municipal Code of the City of Cambridge (Chapter 10.18), adopted on November 16, 1998. Per the ordinance, following are the project facts, projections, commitments, and certification.

Project Facts and Projections

■

Project Description

205 Broadway Realty Trust has constructed an approximately 180,000 square foot office building and a 221-space parking structure at 50 Hampshire Street (also known as 205 Broadway), Cambridge, Massachusetts. Access to the site is provided through a driveway on Broadway.

The project site is located along Broadway in the southeastern corner of Cambridge, Massachusetts. Land uses in the area include business, commercial, and residential uses. Regional and local vehicular access to the site is provided by a number of roadways including Broadway, Moore Street, Hampshire Street, Cambridge Street, Massachusetts Avenue, and Memorial Drive. The site area is served by MBTA bus routes (#85 and #64), and is within close proximity (approximately 0.5 miles) to the Central Square and Kendall Square T-stations.

■

Tenants

Per the Parking and Transportation Demand Management ordinance, the PTDM plan must cover all companies parking in the 50 Hampshire Street parking structure. Tenants from both 50 Hampshire Street building and the 60 Hampshire Street building utilize the parking structure at 50 Hampshire Street. The 60 Hampshire Street building predates the construction of the above building and parking facilities at 50 Hampshire Street; tenants historically used the surface parking lot formally located at 60 Hampshire Street.

The main tenant of the 50 Hampshire Street building is Camp Dresser & McKee, Inc. (CDM), who relocated from their former location at Ten Cambridge Center. In addition, Atasca, a restaurant, occupies retail space on the ground floor of the building fronting on Hampshire Street. Companies occupying the additional space on the ground floor of the building do not utilize the 50 Hampshire Street parking garage. Variagenics, Inc. is the only tenant in the 60 Hampshire Street Building and occupies all of the space in that building. At the time of this PTDM amendment, both 50 and 60 Hampshire Street are 100 percent occupied. Table 1 presents the square footage occupied and the number of allocated parking spaces for each tenant using the 50 Hampshire Street garage.

Table 1
Lease and Parking Space Summary

Tenant	Square Footage Occupied	Number of Parking Spaces
Camp Dresser & McKee	180,000	200[1]
Variagenics	39,014	15
Atasca	1,952	2[2]

1 Three of these spaces are subleased to Atasca.
2 Three additional spaces are subleased from Camp Dresser and McKee.

Parking Supply

Before construction of the 50 Hampshire Street building, the site contained an approximately 100-space surface parking lot that was used by the employees and visitors of the adjacent 38,000 square foot office building at 60 Hampshire Street (205 Broadway), formerly occupied by Tofias Fleishman Shapiro. As part of the development of 50 Hampshire Street, the surface parking lot was replaced by the 180,000 square foot office building and 221 structured parking spaces. These spaces are used solely by the employees and visitors of the 50 and 60 Hampshire Street buildings. There are limited off-site parking opportunities in the area within walking distance. On-street parking is provided for Cambridge residents only and is heavily enforced by the City; a few public parking garages are located in the area, but they are distant from the site.

Vehicle-Trip Generation and Distribution

As part of the PTDM monitoring effort, driveway and garage entrance/exit counts were conducted to determine the vehicle trip generation of the companies at 50 and 60 Hampshire Street. The morning peak hour at the pick-up/drop-off turn out along Hampshire Street was 7:45 - 8:45 AM, when an average of ten vehicle trips were generated. The evening peak hour occurred from 4:45 - 5:45 PM. During this time 16 vehicle trips were generated. The turn out also serves as a stop for the Kendall Square shuttle. The shuttle makes seven morning peak hour stops and three evening peak hour stops.

From the data collected, it was determined that the morning peak hour for the parking garage is 7:00 – 8:00 AM. During this time, 70 entering trips and 11 exiting trips were observed. Four entering and 56 exiting trips were observed during the evening peak hour, which occurred from 4:00 – 5:00 PM. These peak hour trips are summarized in Table 2.

Table 2
Vehicle-Trip Generation Summary

Time Period	Garage	Pick-up / Drop-off	Total Vehicle-Trips
Morning Peak Hour			
Enter	70	10	80
Exit	11	10	21
Total	81	20	101
Evening Peak Hour			
Enter	4	16	20
Exit	56	16	72
Total	60	32	92

Source: VHB Driveway counts, May 2001

It is important to note that the project was projected to generate approximately 155 morning and 155 evening peak hour trips based on ITE *Trip Generation*, 6th Edition' and assuming a 60 percent vehicle mode share. Driveway counts show that actual vehicle trips fall approximately 53 percent below these estimates.

Original trip distribution estimates indicated that approximately 40 percent of the employees driving to work will arrive from the north, 30 percent will arrive via Broadway from the east, 20 percent will arrive from the west via Broadway and/or Hampshire Street, and the remaining 10 percent will arrive from the south via Windsor Street, Portland Street, and other local roadways. The place of origin of the employees at the site and their likely travel routes was estimated based on 1990 census journey-to-work data and zip code data for current CDM employees. It is assumed that these estimates are accurate and that current trips generated follow this distribution pattern.

It should be noted that the development is located in proximity to Kendall Square and the Citizens Bank building. This area provides several opportunities within walking distance for eating, banking, and running errands, thus minimizing vehicle-trips during the day.

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1 Institute of Transportation Engineers (ITE), Trip Generation, ^th Edition Land Use Code 714.

Parking Utilization

Parking utilization counts indicate that the peak parking period for the 50 Hampshire Street garage occurs from 1:00 – 2:00 PM. During this time, 155 of the 221 parking spaces are utilized. This represents 67 percent peak occupancy.

Commitments

Per the Parking and Transportation Demand Management ordinance, the PTDM plan must cover all companies parking in the 50 Hampshire Street parking structure. The building owner is committed to working with the Cambridge Office of Work Force Development and the Parking and Transportation Demand Management planning officer to implement the vehicle trip reduction measures for all applicable tenants as described below. The existing automobile mode split for the census tract 3524 (where the project is located) is 62 percent. Accordingly, consistent with City practice, the mode split goal for this project shall be 56 percent, based on a ten percent reduction from the 1990 Census data. The annual PTDM monitoring survey completed in June 2001 indicates that the overall drive alone mode share for all occupants of the 50 Hampshire Street garage is 47 percent. This is less than the drive alone target of 56 percent set by the City in the Original PTDM plan.

However, pursuant to standard City calculations, the parking provided for this project can only accommodate a 37 percent mode split. This is a result of providing less parking, which is expected to discourage SOV travel. Accordingly, although the mode split goal to which the building owner commits-and to which any enforcement may apply—under this PTDM plan remains 56 percent, the building owner understands that if the single occupant vehicle mode split exceeds 37 percent despite the reduced parking availability in the project, then appropriate additional reasonable measures to reduce SOV levels will be implemented on a voluntary basis to reduce any neighborhood impacts.

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Transportation Demand Management Plan

The owner is committed to implementing transportation demand management (TDM) strategies to minimize the number of single-occupant vehicle commuters and reduce peak hour demands to the site. The TDM plan for the site will include charging employees for parking, participation in the Charles River TMA, preferential parking for carpools and vanpools, staggered and flexible work hours, transit service information, shuttle services to the Kendall Square T-stop, ridesharing programs, bicycle amenities, and on-site employee services.

CDM currently provides a modest TDM program, including flexible work hours, and charging employees for parking to further encourage the use of alternate modes to commute to the site. Variagenics does not currently provide a TDM program. However, as indicated below the company is willing to work with the owner to institute a TDM program comparable to CDM. Each of the TDM strategies proposed by the building owner and/or the tenants of 50 or 60 Hampshire Street (CDM and Variagenics) for the new site are discussed below.

Parking Charges

Camp Dresser & McKee will continue to charge employees for parking to encourage the use of alternate modes to commute to the site. This will provide an economic disincentive to each individual employee to drive, thereby providing a strong motivation to use transit, walk, bike, or carpool.

Charles River Transportation Management Association

The Charles River Transportation Management Association (TMA), which was established in 1994, provides assistance with preparing and implementing transportation demand management programs for companies in East Cambridge and the surrounding areas. The TMA provides shuttle services between the Kendall Square and Central Square MBTA stations and participating employers, and coordinates ridermatching services and a Guaranteed Ride Home (GRH) program (GRH program is described below), among other TDM strategies. The building owner became a member of the Charles River TMA upon occupancy of the building.

Preferential Parking for Carpools and Vanpools

The building owner will provide a minimum of 22 (10 percent of total supply) preferential parking for carpoolers and vanpoolers. These spaces will be clearly signed and/or marked for ridesharers only. Ridesharers will be required to register with their employers to receive a rideshare parking space permit to display in their vehicle. The use of these spaces will be monitored periodically to ensure that they serve ridesharers only. Preferential parking spaces are currently provided per the driver/carpooler’s preference and are generally located on the basement and second levels nearest the elevator lobbies.

Alternative Work Programs

CDM and Variagenics will provide information to their employees on staggered and flexible/compressed work hours and telecommuting aimed at providing added convenience to their employees and reducing peak hour trips. Allowing some flexibility in work times sometimes allows persons to carpool or vanpool. It may also enable persons to utilize bus services because of the bus schedules. Flexible work hour programs can have a significant impact when bus services and vanpooling

opportunities are fairly limited. Staggering work hours can allow people to commute to work on either side of a peak traffic period, reducing the number of vehicles entering the site during the peak hour. Compressed work-weeks and telecommuting minimize the total number of trips being made overall to the site.

Public Transportation Incentives

CDM and Variagenics will post transit service information as a means of encouraging the use of public transit. As previously mentioned, the site area is served by MBTA bus routes (#85 and #64), and is within proximity to the Central Square and Kendall Square T-stations.

Shuttle to the Kendall Square T-Stop

As an additional incentive to use public transit, the project proponent will continue to provide a shuttle to the Kendall Square T-station. This shuttle is provided in partnership with the 210 Broadway building, and will operate between 7 AM and 11 AM and 3 PM and 7 PM. The shuttle will operate between the site and Kendall Square via Broadway. Stops are provided at the site (serving both 50 and 60 Hampshire Street and 210 Broadway) and at Kendall Square.

Ridesharing Program

Ridesharing programs are provided to encourage commuters to ride in vehicles with other commuters, rather than drive alone. The most common forms of ridesharing are carpools and vanpools. This program includes:

- *Carpool/vanpool Incentives*: Ridematching services provide an opportunity for employees to determine whether there are other commuters who share the same travel characteristics and would be available to form a carpool or vanpool. Ridematching services are offered through the Charles River TMA for the benefit of all tenants. The transportation coordinator will also coordinate ridesharing services with CARAVAN for Commuters, if the TMA is not doing so. Additionally, the transportation coordinator provides an area for employees to post information regarding carpools for those not interested in participating in the RideSource database.
- *Guaranteed Ride Home Program*: Guaranteed ride home programs are established to provide assurances that employees who participate in carpooling, vanpooling, bicycling, walking, or transit use will have viable and convenient travel options if work-related activity or an emergency requires that they miss their regular ride/walk home. This service is provided through the Charles River TMA with the implementation of the carpooling program, and is also made available to other users of alternative modes of transportation. These modes have been

expanded to include employees who walk or bike to work, in order to provide these employees with additional flexibility in making their commute decisions. The project proponent is working with the TMA and the City to determine the most effective method to implement and operate the program, per the TMA's general policy for providing the GRH service. Similar to other GRHs, limits on use (such as the number of times a month it can be used) have been implemented to ensure that the program serves the non-SOV commuting population and that it is viewed as an incentive for non-SOV travel.

- *Promotional Activities*: The proponent provides new tenant employees with information concerning carpooling and transit schedules. Additionally, the project proponent will host transportation information fairs annually and distribute promotional materials semiannually to remind employees and tenants of the available ridesharing and transit commuting alternatives, as well as walking and bicycling and alternative work hour options. The City will be invited to participate in these promotional efforts.

Provision of Bicycle and Pedestrian Amenities

The project proponent provides secure, covered bicycle storage areas for their tenants employees and visitors interested in bicycling to work. The tenant provides information relative to these bicycle facilities and amenities to their employees. Bicycle racks are provided on site, and a secure storage area is provided in the building sufficient to accommodate a minimum of twenty-two bicycles (10 percent of parking supply). Showers and locker facilities are provided within the building for employees to use. The proponent also provides short-term bicycle parking near the main entrance to the building, to accommodate visitors traveling by bicycle. This facility provides short-term storage for commuters, as well as a secure place for bicycle couriers to leave their bicycles.

The project driveway has been designed to provide a level crossing for pedestrians and to maintain adequate sight distance for both vehicles and pedestrians. Additionally, the building façade has been designed to provide adequate sight distance so that exiting vehicles can clearly see pedestrians

Designation of Transportation Coordinator

CDM and Variagenics each designate a transportation coordinator to implement and oversee the day-to-day operations of the TDM program. Those individuals will be available to provide employees with information regarding their commuting options and will coordinate program elements with the Charles River TMA. The transportation coordinators will be responsible to post alternative mode information at one or more highly visible locations in 50 Hampshire Street. The posted information will include descriptions of the various sponsored TDM programs, as well as bus and subway schedules, and maps of local public transit routes and/or other relevant information. The information will be kept up to date, and will be supplemented by internal mailings and electronic mailings of updates or changes in any TDM programs.

Encouragement of Electric Vehicles

The project proponent will encourage the use of electric vehicles by committing to provide an electric vehicle charging stand within 60 days for each employee who requests that one be installed. The employee requesting the charging station must use an electric vehicle to commute to and from the site.

Marketing of TDM Programs

To promote all non-SOV alternatives to commuting, CDM and Variagenics will provide new employees information concerning carpooling, transit schedules, alternative work hours, walking, bicycling, etc. Additionally, the project proponent will host transportation information fairs annually and distribute promotional materials semiannually to remind employees and tenants of the available ridesharing and transit commuting alternatives, as well as walking and bicycling and alternative work hour options. The City will be invited to participate in these promotional efforts.

All information provided by The Bulfinch Companies, the Charles River TMA, or the tenant is posted within CDM break/copy rooms on employee bulletin boards. CDM and Variagenics also post commuting information on their web site. All materials provided to The Bulfinch Companies will be delivered to the proper authorities as directed.

Office of Workforce Development

The project proponent will continue to encourage tenants to work with the Cambridge Office of Workforce Development to facilitate the hiring of qualified Cambridge residents at the 50 and 60 Hampshire Street businesses. Currently, CDM actively recruits from the Neighbors for a Better Community Inc. on a regular basis.

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Monitoring and Reporting Plan

The building owner remains committed to completing an annual PTDM monitoring report. The PTDM monitoring and reporting effort will continue to include:

- Yearly employee surveys to determine the mode split for the project and whether the mode split commitment is being met.

- Driveway and parking utilization counts, to be conducted at two-year intervals to provide additional information on the project's trip generation. (The development has completed 2001 driveway and parking is currently in its alternate year.)
- A report to be filed with the City each and every year reporting yearly mode split information and alternate year driveway count information.

The initial monitoring report was completed and submitted to the City of Cambridge in July 2001, containing information from employee and parking data collected in May 2001. This report indicates that building employees achieve a 47 percent drive-alone mode share meeting the commitment established in the original PTDM plan. In addition driveway and parking utilization counts indicate that the projects trip generation is below that originally estimated.

Certification

"I hereby certify that a commercial parking permit has been obtained for each parking space being used for commercial parking. None of the other existing or proposed parking spaces at this parking facility have been or will be available as commercial parking spaces until a commercial parking permit has been obtained."

/s/ Robert A. Schlager
Robert A. Schlager, Member
BHX, LLC, as sole trustee for 205 Broadway Realty Trust
c/o The Bulfinch Companies
250 First Avenue, Suite 200
Needham, Massachusetts 02494

50 Hampshire Street
Office Development

Cambridge, Massachusetts

Prepared for

BHX, LLC, as sole trustee for 205 Broadway Realty Trust
250 First Avenue, Suite 200
Needham, MA 02194
781 707-4000

Prepared by

VHB/Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
101 Walnut Street
P.O. Box 9151
Watertown, Massachusetts 02272
617 924-1770

June 28, 1999

Introduction

This Parking and Transportation Demand Management Plan has been prepared in accordance with the ordinance to the Municipal Code of the City of Cambridge (Chapter 10.18), adopted on November 16, 1998. Per the ordinance, following are the project facts, projections, commitments, and certification.

Project Facts and Projections

Project Description

205 Broadway Realty Trust is currently constructing an approximately 180,000 square feet office building and a 221-space parking structure at 50 Hampshire Street (aka 205 Broadway), Cambridge, Massachusetts. Access to the site will be provided through a driveway on Broadway. The building will be occupied by Camp Dresser & McKee, Inc. (CDM), who will be relocating from their current location at Ten Cambridge Center. CDM expects to house approximately 600 employees at this new building.

The project site is located along Broadway in the southeastern corner of Cambridge, Massachusetts. Land uses in the area include business, commercial, and residential. Regional and local vehicular access to the site is provided by a number of roadways including Broadway, Moore Street, Hampshire Street, Cambridge Street, Massachusetts Avenue, and Memorial Drive. The site area is served by MBTA bus routes (#85 and #64), and is within close proximity (approximately 0.5 miles) to the Central Square and Kendall Square T-stations.

Parking Supply

Before construction of the building began, the site contained an approximately 100-space surface parking lot that was used by the employees and visitors of the adjacent 38,000 square foot office building at 60 Hampshire Street (aka 205 Broadway), formerly occupied by Tofias Fleishman Shapiro. As part of the development of 50 Hampshire Street, the surface parking lot is being replaced by the 180,000 square foot office building and 221 structured parking spaces. These spaces will be used solely by the employees and visitors of the 50 and 60 Hampshire Street buildings. There are limited off-site parking opportunities in the area within walking distance. On-street parking is provided for Cambridge residents only and is heavily enforced; a few public parking garages are located in the area, but they are distant from the site.

Project Vehicle-Trip Generation

The number of weekday daily and peak hour vehicle-trips projected to be generated by the CDM building and associated parking were estimated based on trip rates published by the Institute of Transportation Engineers (ITE) in the Trip Generation *6th Edition* report using Land Use Code 714, Corporate Headquarters. These rates were then adjusted to reflect the various modes of travel to be used (private automobile, public transportation, walking/bicycling) based on 1990 census journey-to-work data. Table 1 summarizes the projected daily and morning and evening peak hour vehicle trips.

Table 1
Vehicle-Trip Generation Summary

Time Period	Total Vehicle-Trips
Average Weekday*	840
Morning Peek Hour**	
Enter	145
Exit	10
Total	155
Evening Peak Hour**	
Enter	20
Exit	135
Total	155

Source: ITE, Trip Generation, 6th Edition, LUC 714, Corporate Headquarters (180 ksf), 60% vehicle-mode share

* Two-way traffic volumes expressed in vehicles per day.
** Traffic volumes expressed in vehicles per hour.

As shown in Table 1, the project is projected to generate approximately 840 vehicle-trips (420 entering and 420 exiting) on a typical weekday. The project will generate 155 vehicle-trips (145 entering and 10 exiting) during the morning peak hour and 155 vehicle-trips (20 entering and 135 exiting) during the evening peak hour.

It should be noted that the development is located in close proximity to Kendall Square and the US Trust building. This area provide several opportunities within walking distance for eating, banking, and running errands, thus minimizing vehicle-trips during the day.

Trip Distribution

The place of origin of the future employees at the site and their likely travel routes was estimated based on 1990 census journey-to-work data and zip code data for current CDM employees. Based on this data, it is anticipated that approximately 40 percent of the employees driving to work will arrive from the north, 30 percent will arrive via Broadway from the east, 20 percent will arrive from the west via Broadway and/or Hampshire Street, and the remaining 10 percent will arrive from the south via Windsor Street, Portland Street, and other local roadways.

Commitments

Per the Parking and Transportation Demand Management ordinance, the project proponent is committed to working with the Cambridge Office of Work Force Development and the Parking and Transportation Demand Management planning officer to implement the vehicle trip reduction measures described below. The existing automobile mode split for the census tract 3524 (where the project is located) is 62 percent. Accordingly, consistent with City practice, the mode split goal for this project shall be 56 percent, based on a ten percent reduction from the 1990 Census data.

However, pursuant to standard City calculations, the parking provided for this project can only accommodate a 37 percent mode split. This is a result of providing less parking, which is expected to discourage SOV travel. Accordingly, although the mode split goal to which the project proponent commits — and to which any enforcement may apply — under this PTDM plan remains 56 percent, the project proponent understands that if the single occupant vehicle mode split exceeds 37 percent despite the reduced parking availability in the project, then appropriate additional reasonable measures to reduce SOV levels will be implemented on a voluntary basis to reduce any neighborhood impacts.

Transportation Demand Management Plan

The project proponent is committed to implementing transportation demand management (TDM) strategies to minimize the number of single-occupant vehicle commuters and reduce peak hour demands to the site. The TDM plan for the site will include charging employees for parking, participation in the Charles River TMA, preferential parking for carpools and vanpools, staggered and flexible work hours, transit service information, shuttle services to the Kendall Square T-stop, ridesharing programs, bicycle amenities, and on-site employee services.

CDM currently provides a modest TDM program, including flexible work hours, and charging employees for parking to further encourage the use of alternate modes to commute to the site. Bach of the TDM strategies proposed by the project proponent and/or the tenant (CDM) for the new site are discussed below.

Parking Charges

CDM will charge employees for parking to encourage the use of alternate modes to commute to the site. This will provide an economic disincentive to each individual employee to drive, thereby providing a strong motivation to use transit, walk, bike, or carpool.

Charles River Transportation Management Association

The Charles River Transportation Management Association (TMA), which was established in 1994, provides assistance with preparing and implementing transportation demand management programs for companies in East Cambridge and the surrounding areas. The TMA provides shuttle services between the Kendall Square and Central Square MBTA stations and participating employers, and coordinates ridematching services and a Guaranteed Ride Home (GRH) program (GRH program is described below), among other TDM strategies. The project proponent will join the TMA upon occupancy of the building.

Preferential Parking for Carpools and Vanpools

The project proponent will provide a minimum of twenty-two (10 percent of total supply) preferential parking for carpoolers and vanpoolers. These will be designated, convenient spaces near the entrance to the building. These spaces will be clearly signed and/or marked for ridesharers only. Ridesharers will be required to register with their employers to receive a rideshare parking space permit to display in their vehicle. The use of these spaces will be monitored periodically to ensure that they serve ridesharers only.

Alternative Work Programs

CDM will provide information to their employees on staggered and flexible/compressed-work hours and telecommuting aimed at providing added convenience to their employees and reducing peak hour trips. Allowing some flexibility in work times sometimes allows persons to carpool or vanpool. It may also enable persons to utilize bus services because of the bus schedules. Flexible work hour programs can have a significant impact when bus services and vanpooling opportunities are fairly limited, Staggering work hours can allow people to commute to work on either side of a peak traffic period, reducing the number of vehicles entering the site during the peak hour. Compressed work weeks and telecommuting minimize the total number of trips being made overall to the site.

Public Transportation Incentives

CDM will post transit service information as a means of encouraging the use of public transit. As previously mentioned, the site area is served by MBTA bus routes (#85 and #64), and is within close proximity to the Central Square and Kendall Square T-stations.

Shuttle to the Kendall Square T-Stop

As an additional incentive to use public transit, the project proponent will provide a shuttle to the Kendall Square T-station. This shuttle will either be provided by the proponent itself, or may be provided through the Charles River TMA or other service. This shuttle will be provided in partnership with the 210 Broadway building, and will operate between 7 AM and 11 AM and 3 PM and 7 PM. The shuttle will operate between the site and Kendall Square via Broadway, stops will be provided at the site (serving both 50 and 60 Hampshire Street and 210 Broadway) and at Kendall Square.

Ridesharing Program

Ridesharing programs are provided to encourage commuters to ride in vehicles with other commuters, rather than drive alone. The most common forms of ridesharing are carpools and vanpools. This program includes:

- *Carpool/vanpool Incentives*: Ridematching services provide an-opportunity for employees to determine whether there are other commuters who share the same travel characteristics and would be available to form a carpool or vanpool. Ridematching services will be offered through the Charles River TMA for the benefit of the employees housed therein. The transportation coordinator will also coordinate ridesharing services with CARAVAN for Commuters, if the TMA is not doing so. Additionally, the transportation coordinator will provide an area for employees to post information regarding carpools for those not interested in participating in the RideSource database.
- *Guaranteed Ride Home Program*: Guaranteed ride home programs are established to provide assurances that employees who participate in carpooling, vanpooling, bicycling, walking, or transit use will have viable and convenient travel options if work-related activity or an emergency requires that they miss their regular ride/walk home. This service will be provided through the Charles River TMA with the implementation of the carpooling program, and will also be made available to other users of alternative modes of transportation. These modes have been expanded to include employees who walk or bike to work, in order to provide these employees with additional flexibility in making their commute decisions. The project proponent will work with the TMA and the City to determine the most effective method to implement and operate the program, per

the TMA's general policy for providing the GRH service. It is anticipated that, similar to other GRHs, limits on use (such as the number of times a month it can be used), etc. will be implemented to ensure that the program serves the non- SOV commuting population and that it is Viewed as an incentive for non-SOV travel.

- *Promotional Activities*: The tenant will provide their new employees information concerning carpooling and transit schedules. Additionally, the tenants will host transportation information fairs annually to remind employees and tenants of the available ridesharing and transit commuting alternatives, as well as walking and bicycling and alternative work hour options. The tenant will invite the City to participate in these promotional efforts.

Provision of Bicycle and Pedestrian Amenities

The project proponent will provide secure, covered bicycle storage areas for their employees and visitors interested in bicycling to work. The tenant will provide information relative to these bicycle facilities and amenities to their employees. Bicycle racks will be provided on site, and a secure storage area will be provided in the building sufficient to accommodate a minimum of twenty-two bicycles (10 percent of parking supply). Showers and locker facilities will be provided within the building for employees use. The proponent will also provide short-term parking near the main entrance to the building, to accommodate visitors travelling by bicycle. This facility will provide short-term storage for commuters, as well as a secure place for bicycle couriers to leave their bicycles.

The project driveway has been designed to provide a level crossing for pedestrians and to maintain adequate sight distance for both vehicles and pedestrians. Additionally, the building façade has been designed to provide adequate sight distance so that exiting vehicles can clearly see pedestrians. If it is determined that sight distance may be an issue, a warning device will be installed to inform pedestrians that a vehicle is preparing to exit the garage.

Designation of Transportation Coordinator

CDM will designate a transportation coordinator to implement and oversee the day-to-day operations of the TDM program. This person will be available to provide employees information regarding their commuting options and will coordinate program elements with the Charles River TMA, The transportation coordinator will be responsible to post alternative mode information at one or more highly visible locations in 50 Hampshire Street. The posted information will include descriptions of the various sponsored TDM programs, as well as bus and subway schedules, and maps of local public transit routes and/or other relevant information. The information will be kept up to date, and will be supplemented by internal mailings and electronic mailings of updates or changes in any TDM programs.

Encouragement of Electric Vehicles

The project proponent will encourage the use of electric vehicles by committing to provide an electric vehicle charging stand within 60 days for each employee who requests that one be installed. The employee requesting the charging station must use an electric vehicle to commute to and from the site.

Marketing of TDM Programs

To promote all non-SOV alternatives to commuting, CDM will provide new employees information concerning carpooling, transit schedules, alternative work hours, walking, bicycling, etc. Additionally, the project proponent will host transportation information fairs annually to remind employees and tenants of the available ridesharing and transit commuting alternatives, as well as walking and bicycling and alternative work hour options. The City will be invited to participate in these promotional efforts.

CDM will also post commuting information on their web site and place information on commuter information bulletin boards located throughout the building.

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Monitoring and Reporting Plan

The project proponent will commit to implementing a monitoring and reporting plan. This plan will include the following:

- yearly employee surveys to determine the mode split for the project, which will be used to determine if the mode split commitment is being met. These surveys will include mode share information, as well as subjective questions to determine the employees attitudes regarding TDM strategies.
- driveway and parking utilization counts, to be conducted after one year and then every other year to provide additional information on the project's trip generation.
- a report to be filed with the City on the date of issue of the certificate of occupancy for the building. One year later, and each and every year thereafter, yearly mode split information shall be reported every year on that date. In addition, driveway counts for 50 Hampshire Street shall be reported every two years, beginning one year after the certificate of occupancy is issued.
- if the certificate of occupancy is issued between January 1 and June 30, the monitoring shall take place between the months of September or October; if the certificate of occupancy is issued between July 1 and December 31, monitoring shall take place between the months of April and May. The timing of this

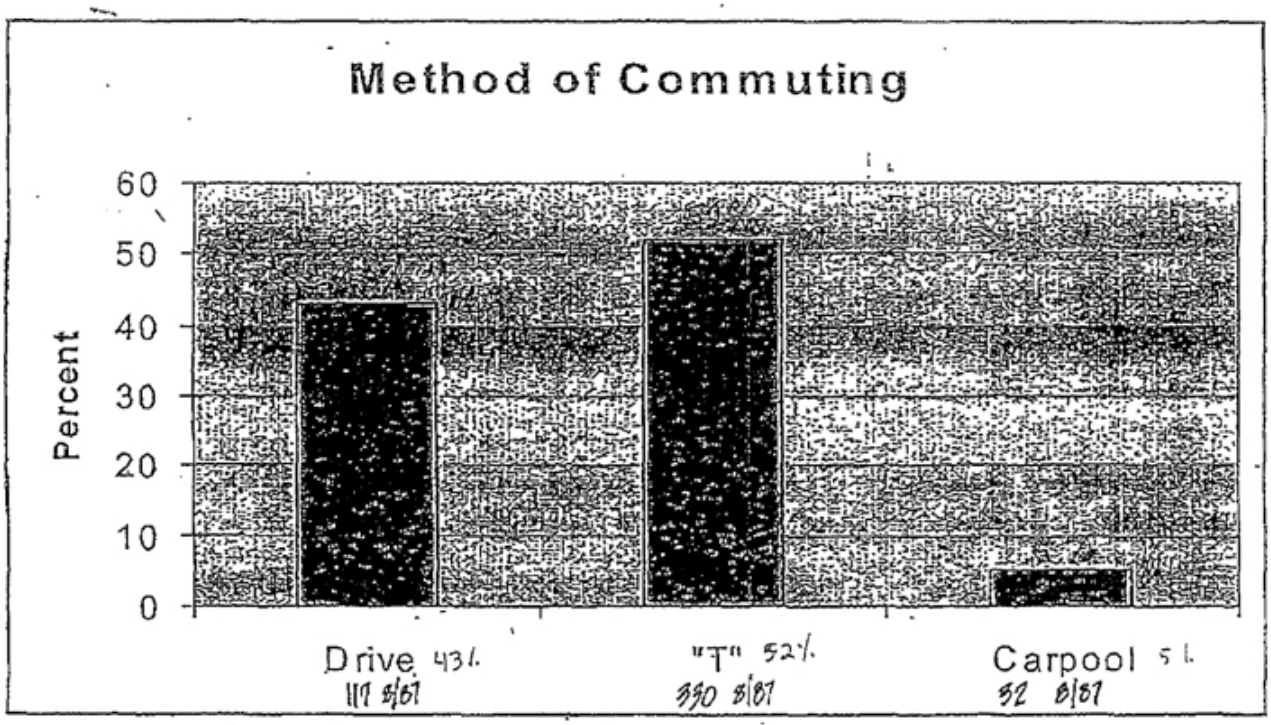
monitoring shall be done in order to capture the most realistic assessment of the performance of the project possible, while giving the proponent adequate time to compile the results and report them to the City.

Certification

"I hereby certify that a commercial parking permit has been obtained for each parking space being used for commercial parking. None of the other existing or proposed parking spaces at this parking facility have been or will be available as commercial parking spaces until a commercial parking permit therefor has been obtained."

/s/ Robert A. Schlager
Robert A. Schlager, Member
BHX, LLC, as sole trustee for 205 Broadway Realty Trust
The Bulfinch Companies
250 First Avenue, Suite 200
Needham, Massachusetts 02494

On most days, what is your present method of commuting to work?



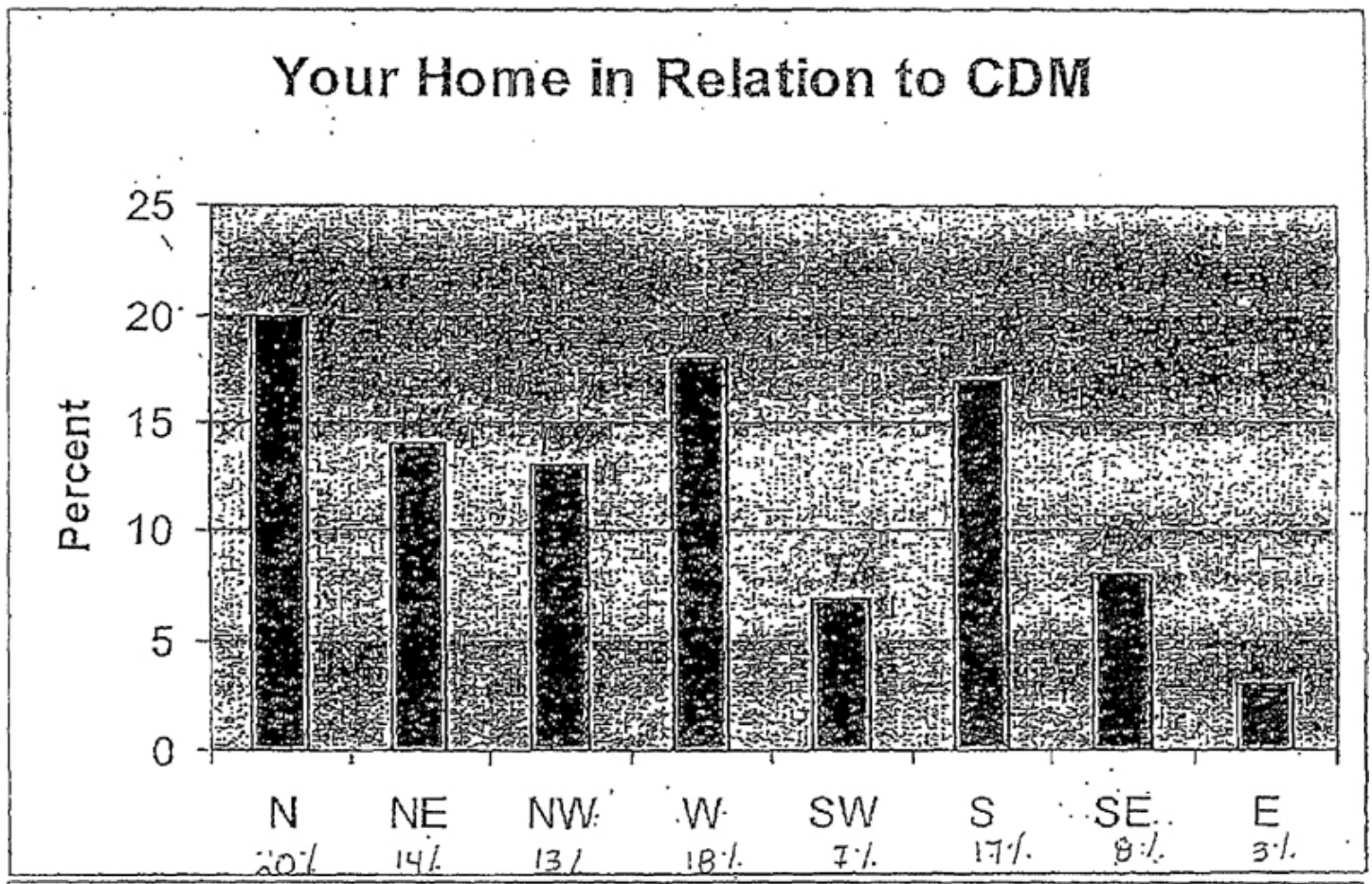
CBM Unit Enrollment Survey

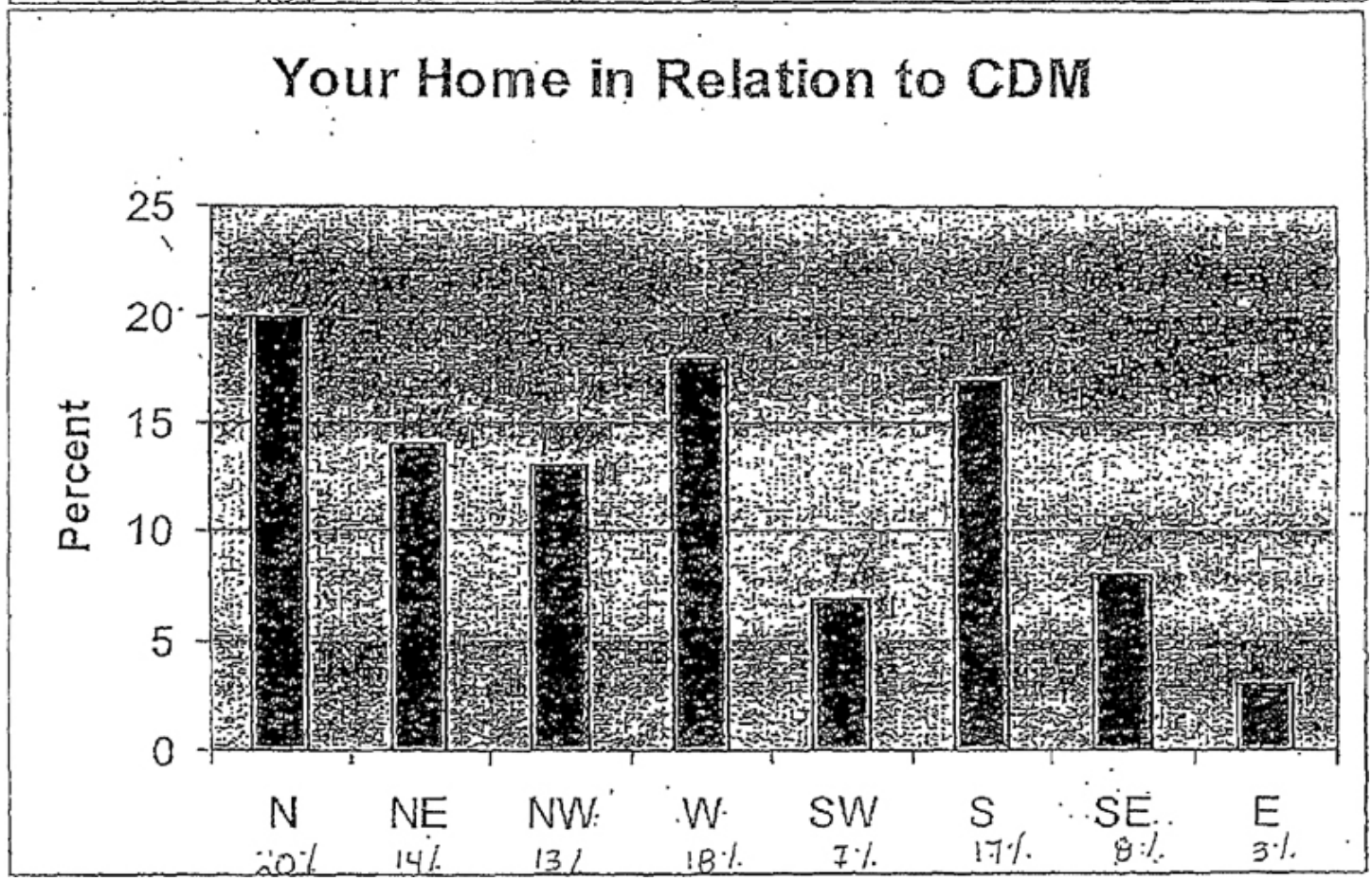
30 OTHER S/67

GRADE 6↑ 117 - 45% DRIVE 142 - 55% T } 416

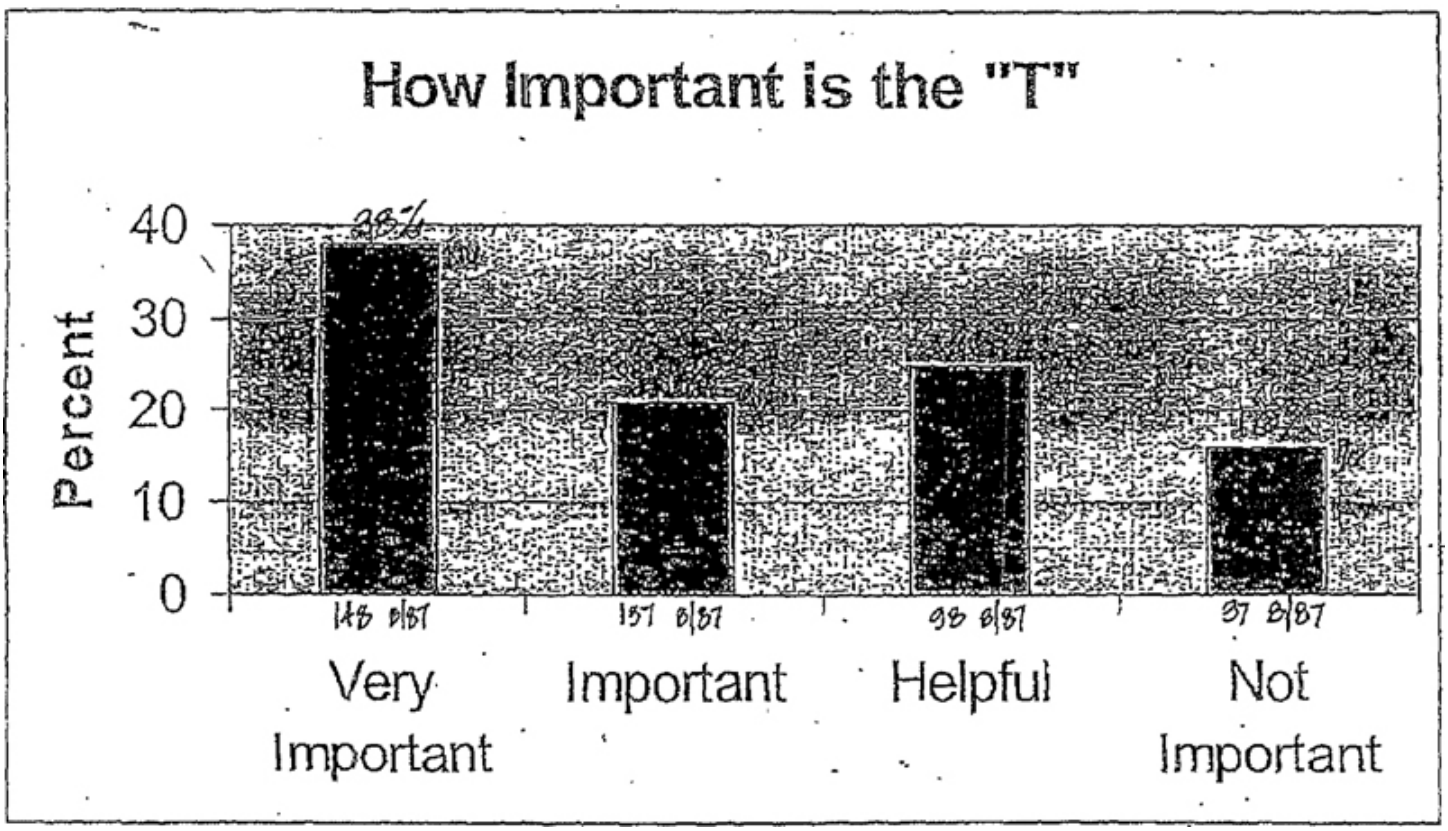
GRADE 5↓ 61 - 39% DRIVE 96 - 61% T

Where is your home in relation to Kendall Square?

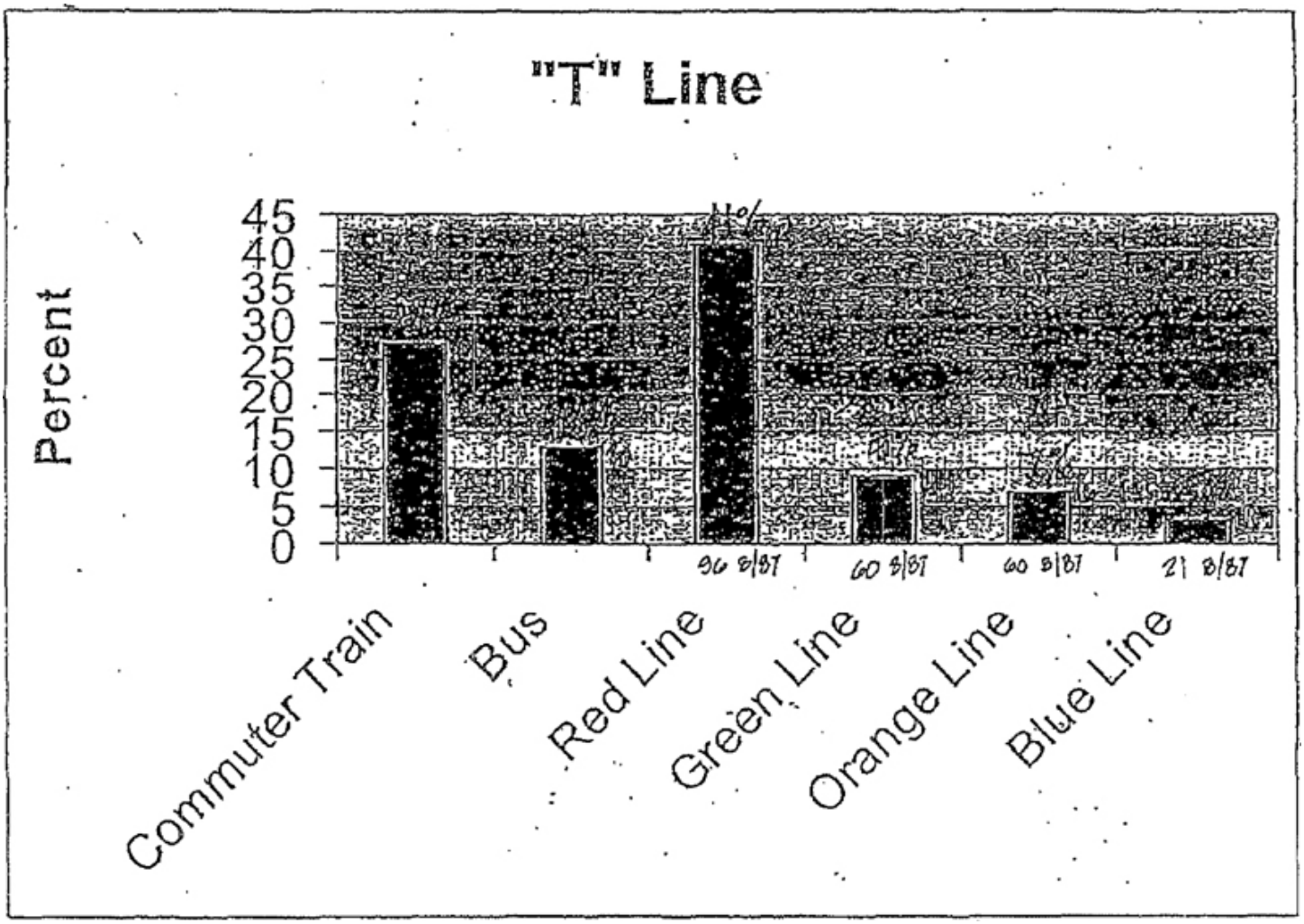




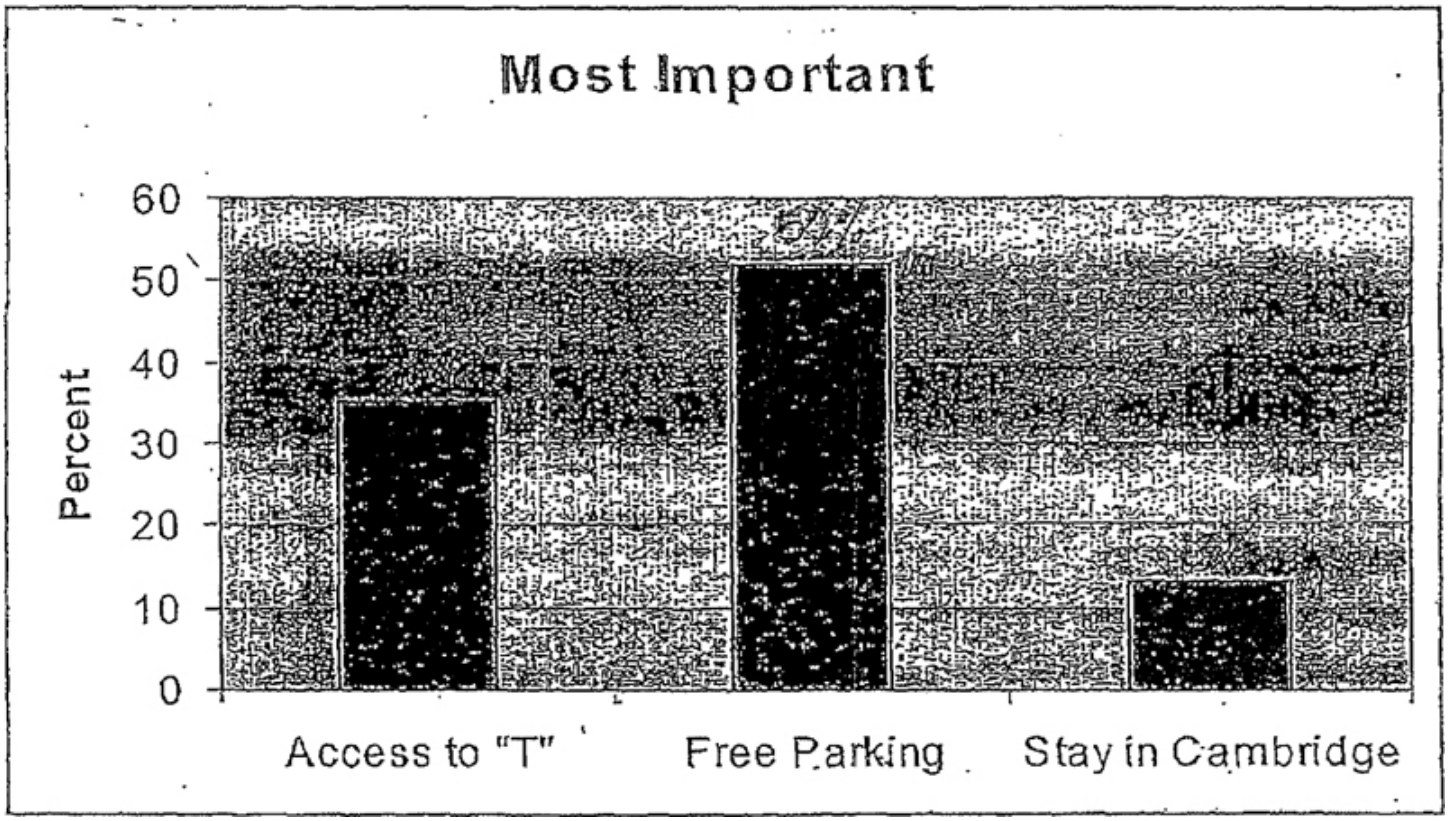
How important is having access to the “T”



For those who take the “T,” which line do you take?



Rate the following in order of importance



What is your current approximate door-to-door commuting time?

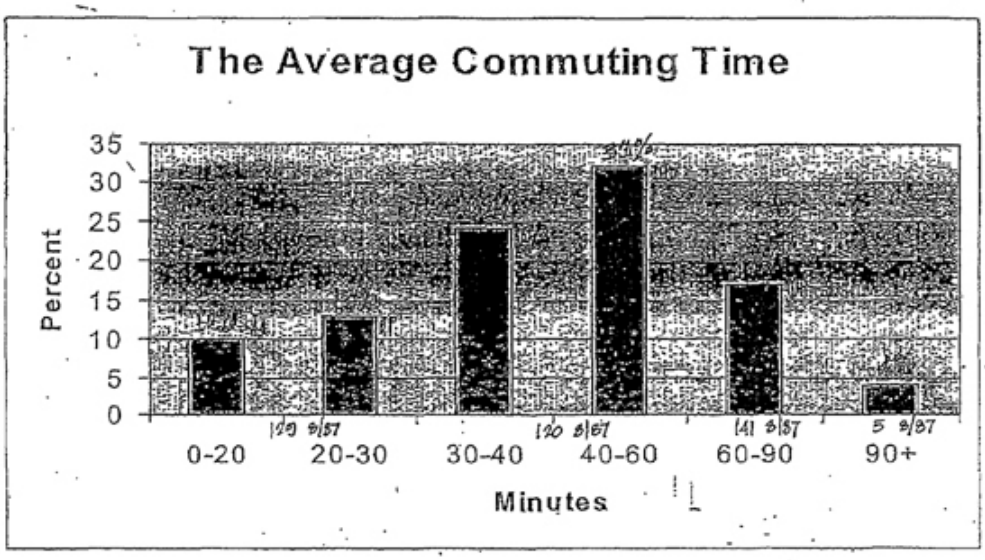


EXHIBIT H

TENANT'S PROPERTY

EXHIBIT I

FORM OF ESTOPPEL CERTIFICATE

To: BMR-HAMPSHIRE LLC
17190 Bernardo Center Drive
San Diego, California 92128
Attention: Vice President, Real Estate Legal

BioMed Realty, L.P.
17190 Bernardo Center Drive
San Diego, California 92128

Re: [PREMISES ADDRESS] (the "Premises") at 50 Hampshire Street, Cambridge, Massachusetts (the "Property")

The undersigned tenant ("Tenant") hereby certifies to you as follows:

1. Tenant is a tenant at the Property under a lease (the "Lease") for the Premises dated as of [ ], 20[ ]. The Lease has not been cancelled, modified, assigned, extended or amended [except as follows: [ ]], and there are no other agreements, written or oral, affecting or relating to Tenant's lease of the Premises or any other space at the Property. The lease term expires on [ ], 20[ ].

2. Tenant took possession of the Premises, currently consisting of [ ] square feet, on [ ], 20[ ], and commenced to pay rent on [ ], 20[ ]. Tenant has full possession of the Premises, has not assigned the Lease or sublet any part of the Premises, and does not hold the Premises under an assignment or sublease[, except as follows: [ ]].

3. All base rent, rent escalations and additional rent under the Lease have been paid through [ ], 20[ ]. There is no prepaid rent[, except $[ ], and the amount of security deposit is $[ ] in the form of a letter of credit. Tenant currently has no right to any future rent abatement under the Lease.

4. Base rent is currently payable in the amount of $[ ] per month.

5. Tenant is currently paying estimated payments of additional rent of $[ ] per month on account of real estate taxes, insurance, management fees and Common Area maintenance expenses.

6. All work to be performed for Tenant under the Lease has been performed as required under the Lease and has been accepted by Tenant[, except [ ]], and all allowances to be paid to Tenant, including allowances for tenant improvements, moving expenses or other items, have been paid.

7. The Lease is in full force and effect, free from default and free from any event that could become a default under the Lease, and Tenant has no claims against the landlord or offsets or defenses against rent, and there are no disputes with the landlord. Tenant has received no notice of prior sale, transfer, assignment, hypothecation or pledge of the Lease or of the rents payable thereunder[, except [ ]].

8. Tenant has no rights or options to purchase the Property.

9. To Tenant's knowledge, no hazardous wastes have been generated, treated, stored or disposed of by or on behalf of Tenant in, on or around the Premises or the Project in violation of any environmental laws.

10. The undersigned has executed this Estoppel Certificate with the knowledge and understanding that [INSERT NAME OF LANDLORD, PURCHASER OR LENDER, AS APPROPRIATE] or its assignee is [acquiring the Property/making a loan secured by the Property] in reliance on this certificate and that the undersigned shall be bound by this certificate. The statements contained herein may be relied upon by [INSERT NAME OF PURCHASER OR LENDER, AS APPROPRIATE], [LANDLORD], BioMed Realty, L.P., BRE Edison Parent L.P., and any [other] mortgagee of the Property and their respective successors and assigns.

Any capitalized terms not defined herein shall have the respective meanings given in the Lease.

Dated this [ ] day of [ ], 20[ ].

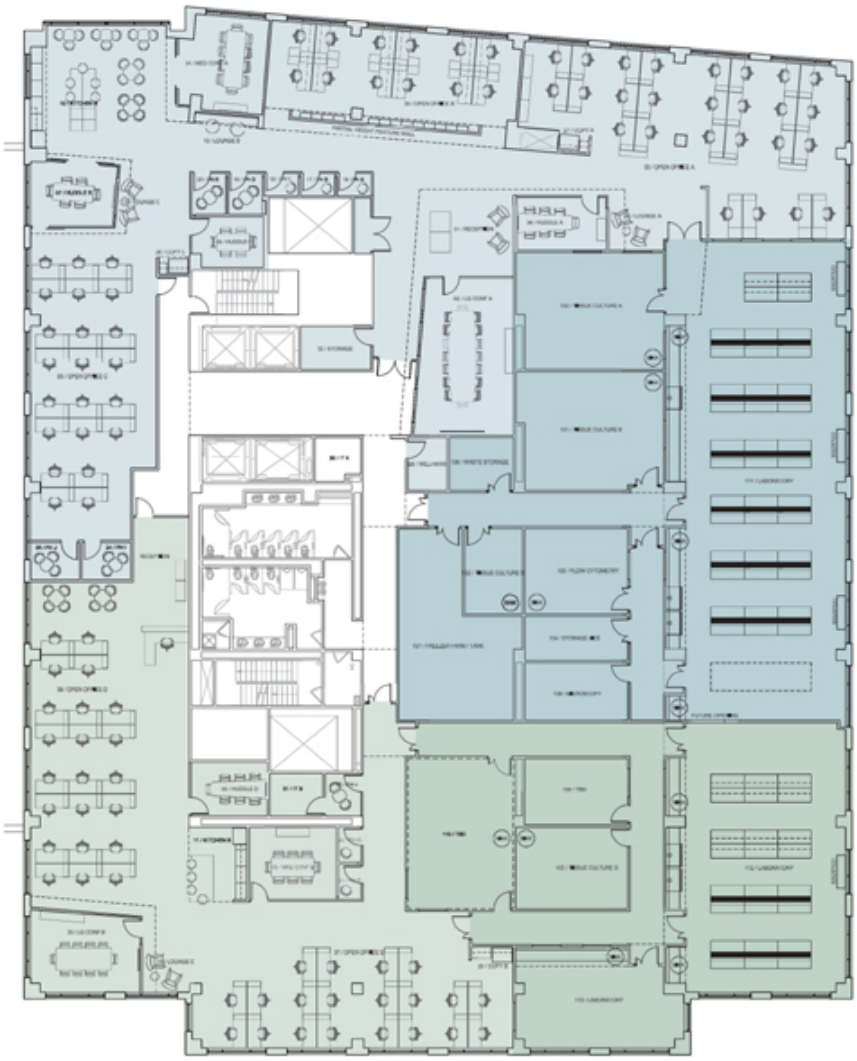
[ ],
a [ ]

By: _____
Name: _____
Title: _____

EXHIBIT B

EIGHTH FLOOR PREMISES

16



SURFACE ONCOLOGY

	Office	Lab	Total
Surface Space	10,409	8,169	18,578 (58%)
Sublease Space	6,522	5,336	11,858 (37%)
Hallway			1,581 (5%)
Total			32,017 RSF

EXHIBIT C

OFFICE AND LABORATORY EQUIPMENT

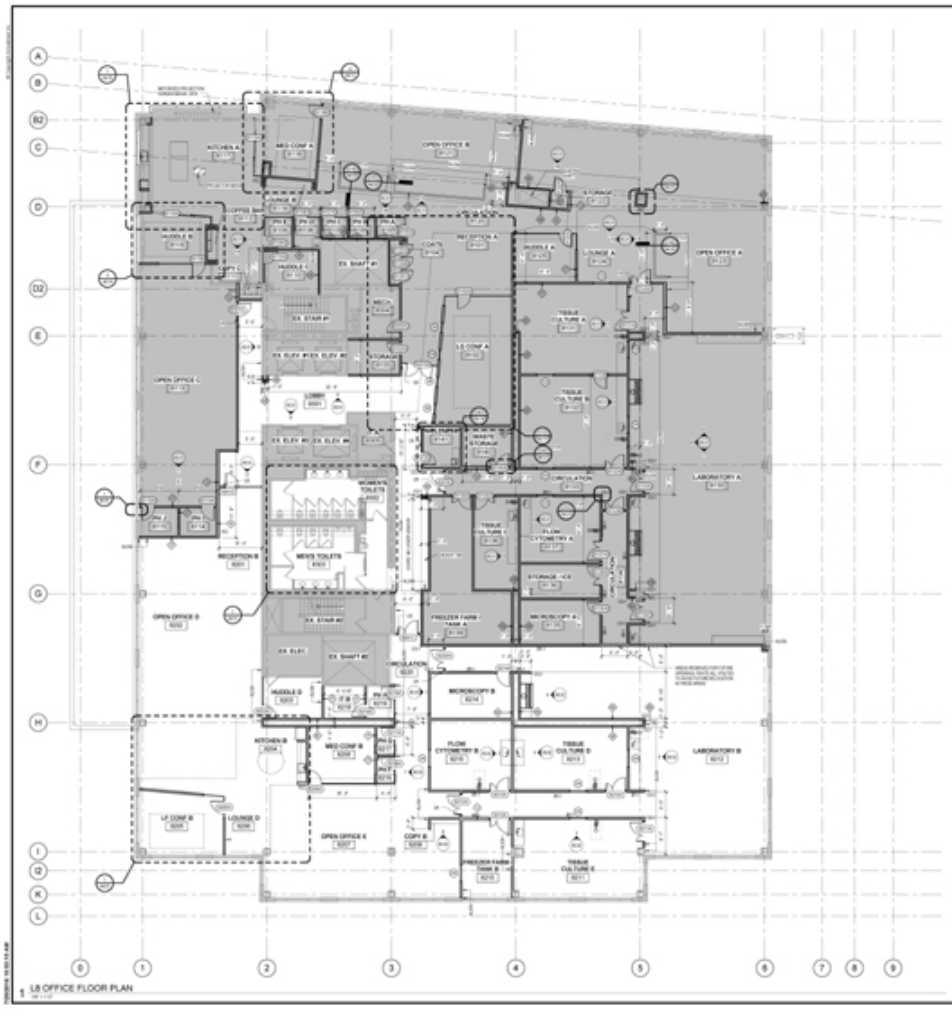
17

EXHIBIT D

SUBLESSOR'S WORK

PLANS AND SPECS FOR SUBLEASED PREMISES

See attached.



BioMed Realty

SURFACE ONCOLOGY

8TH FLOOR TENANT IMPROVEMENTS

50 Hampshire Street
Cambridge, MA

CONSTRUCTION DOCUMENTS

ARROWSTREET
ARCHITECTURE & DESIGN

Project Number	18010
Author	HT, ECS
Checker	CA
Issue date	06/01/2018

Revisions

NO.	DESCRIPTION	ADDENDUM #

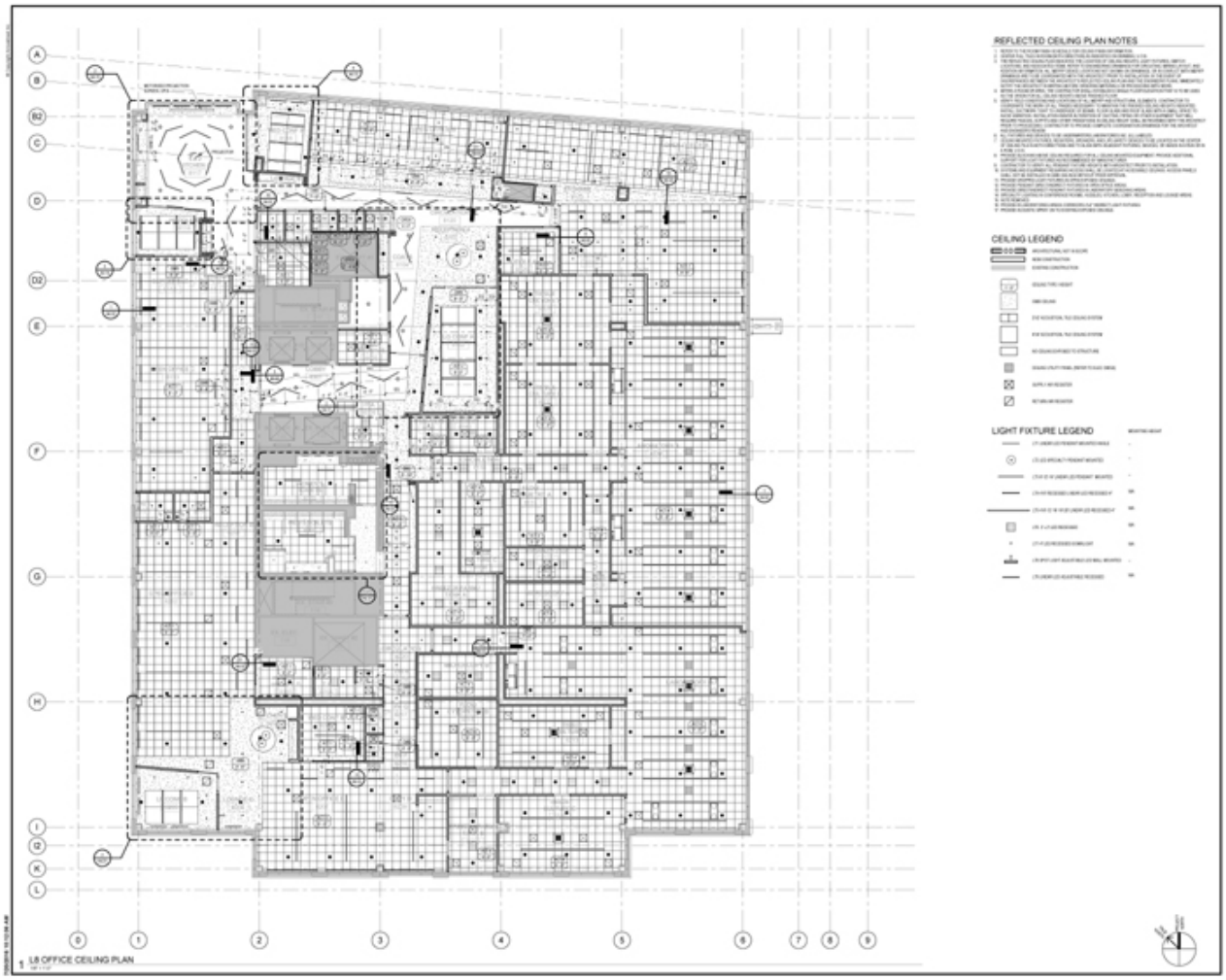
Drawing Title

8TH FLOOR PLAN

SCALE 1/8" = 1'-0"

Drawing Number

A2.18



BioMed Realty

SURFACE ONCOLOGY

8TH FLOOR TENANT IMPROVEMENTS

50 Hampshire Street
Cambridge, MA

CONSTRUCTION DOCUMENTS

ARROWSTREET
ARCHITECTURE & DESIGN

Project Number	18010
Author	AT
Checker	CA
Issue Date	06/01/2018

Revisions

No	Date	Description
1	08/23/18	ADDENDUM #1
2	10/11/18	BULLETIN #1

Drawing Title

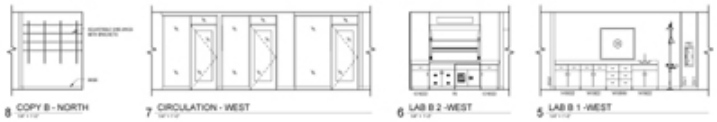
8TH FLOOR CEILING PLAN

SCALE 1/8" = 1'-0"

Drawing Number

A2.38

KEYNOTES



8 COPY B - NORTH

7 CIRCULATION - WEST

6 LAB B 2 -WEST

5 LAB B 1 -WEST

4 TISSUE CULTURE D -WEST

3 TISSUE CULTURE E -NORTH

2 FLOW CYTOMETRY B -EAST

1 CIRCULATION -EAST

BioMed Realty

SURFACE ONCOLOGY

8TH FLOOR TENANT IMPROVEMENTS

50 Hampshire Street
Cambridge, MA

CONSTRUCTION DOCUMENTS

ARROWSTREET
ARCHITECTURE & DESIGN

Project Number	18010
Author	HT, ECS
Checker	DI
Issue Date	06/01/2019

Revisions

NO.	DESCRIPTION	ADDENDUM #

Drawing Title

INTERIOR ELEVATIONS

SCALE 1/4" = 1'-0"

Drawing Number

A5.02