UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 FOR THE TRANSITION PERIOD FROM TO**

Commission File Number 001-38470

Unity Biotechnology, Inc.

(Exact name of Registrant as specified in its Charter)

Delaware	**26-4726035**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
285 East Grand Ave.	
South San Francisco, CA	**94080**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (650) 416-1192

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.0001	UBX	The Nasdaq Global Select Market

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES ☐ NO ☒

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. YES ☐ NO ☒

Indicate by check mark whether the Registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☒ NO ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). YES ☒ NO ☐

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	☐	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 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES ☐ NO ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of the shares of common stock on The Nasdaq Global Select Market on June 28, 2019, was $276,736,207.

The number of shares of Registrant's Common Stock outstanding as of March 6, 2020 was 47,613,143.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement relating to the 2020 Annual Meeting of Shareholders, scheduled to be held on June18, 2020, are incorporated by reference into Part III of this Report. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the end of the fiscal year covered by this Annual Report on Form 10-K.

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Forward-Looking Statements

This Annual Report on Form 10-K contains "forward-looking statements" within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). All statements other than statements of historical facts contained in this Annual Report on Form 10-K are statements that could be deemed forward-looking statements reflecting the current beliefs and expectations of management with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. These statements are often identified by the use of words such as "aim," "anticipate," "assume," "believe," "contemplate," "continue," "could," "due," "estimate," "expect," "goal," "if," "intend," "may," "objective," "plan," "predict," "potential," "positioned," "seek," "should," "target," "will," "would," "until" and similar expressions or variations. Forward-looking statements contained in this Annual Report on Form 10-K include, but are not limited to, statements about:

- our expectations regarding the potential benefits, activity, effectiveness and safety of our drug candidates;
- our expectations with regard to the results of our clinical studies, preclinical studies and research and development programs, including the timing and availability of data from such studies;
- our preclinical, clinical and regulatory development plans for our drug candidates, including the timing or likelihood of regulatory filings and approvals for our drug candidates;
- our expectations with regard to our ability to acquire, discover and develop additional drug candidates and advance such drug candidates into, and successfully complete, clinical studies;
- our expectations regarding the potential market size and size of the potential patient populations for our drug candidates, if approved for commercial use;
- our intentions and our ability to establish collaborations and/or partnerships;
- the timing and amount of any milestone payments we are obligated to make pursuant to our existing license agreements and any future license or collaboration agreements that we may enter into;
- our commercialization, marketing, and manufacturing capabilities and expectations;
- our intentions with respect to the commercialization of our drug candidates;
- the pricing and reimbursement of our drug candidates, if approved;
- the implementation of our business model and strategic plans for our business and drug candidates, including additional indications for which we may pursue;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our drug candidates, including the projected terms of patent protection;
- estimates of our expenses, future revenue, capital requirements, our needs for additional financing, and our ability to obtain additional capital;
- our anticipated use of proceeds from our initial public offering;
- our future financial performance;
- developments and projections relating to our competitors and our industry, including competing therapies; and
- other risks and uncertainties, including those listed under the caption "Risk Factors."

We caution you that the foregoing list may not contain all of the forward-looking statements made in this Annual Report on Form 10-K.

Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. We discuss these risks in greater detail in "Risk Factors" and elsewhere in this Annual Report on Form 10-K. Given these uncertainties, you should not place undue

reliance on these forward-looking statements. Also, forward-looking statements represent our management's beliefs and assumptions only as of the date of this Annual Report on Form 10-K. Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future.

This Annual Report on Form 10-K also contains estimates, projections and other information concerning our industry, our business and the markets for certain drugs, including data regarding the estimated size of those markets, their projected growth rates and the incidence of certain medical conditions. Information that is based on estimates, forecasts, projections 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 third parties, industry, medical and general publications, government data and similar sources. In some cases, we do not expressly refer to the sources from which this data is derived. In that regard, when we refer to one or more sources of this type of data in any paragraph, you should assume that other data of this type appearing in the same paragraph is derived from the same sources, unless otherwise expressly stated or the context otherwise requires.

Trademarks

This Annual Report on Form 10-K includes trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included in this Annual Report on Form 10-K are the property of their respective owners.

PART I

Item 1. Business.

Overview

Our mission is to extend human healthspan. We define healthspan as the period of one's life unburdened by age-related diseases. We are developing therapeutics to extend healthspan by slowing, halting or reversing age-related diseases. Our initial focus is on creating senolytic medicines to selectively eliminate senescent cells and thereby treat age-related diseases, such as osteoarthritis, eye diseases and pulmonary diseases.

Age-related diseases cause considerable economic, personal, and societal burden. As individuals age, the prevalence of chronic disease increases, with 80% of older Americans having at least one chronic disease and 50% having two or more. Age-related diseases negatively impact quality of life, are typically chronic, and progress from the time of onset until death. It is estimated that providing healthcare for people over the age of 65 costs four to five times more than for younger individuals. According to the Centers for Disease Control and Prevention, this elderly population of Americans is expected to nearly double by 2050, increasing the economic burden of aging dramatically. Any success increasing longevity without treating underlying age-related diseases would only serve to increase this burden.

Cellular Senescence

We believe that the accumulation of senescent cells is a fundamental mechanism of aging and a driver of many common age-related diseases. Cellular senescence is a natural biological state in which a cell permanently halts division. These cells are referred to as senescent. As senescent cells accumulate with age, they begin secreting large quantities of more than 100 proteins, including inflammatory factors, proteases, fibrotic factors, and growth factors, that disturb the tissue micro-environment. This collection of secreted proteins is referred to as the Senescence Associated Secretory Phenotype, or SASP. In addition to its effects on tissue function, the SASP contains factors that induce senescence in neighboring cells, setting off a cascade of events that culminates in the formation of the functionally aged and/or diseased tissue that underlies a variety of age-related diseases.

We are developing senolytic medicines to eliminate senescent cells and thereby stop the production of the SASP, which we believe addresses a root cause of age-related diseases. Many existing therapeutics, such as antibodies, target single SASP factors, but fail to remove the cells that continually produce SASP factors. By stopping the production of the SASP at it source, we believe senolytic medicines could have a more durable impact on disease and could slow, halt, or reverse particular age-related diseases, and shift the treatment paradigm from chronic to intermittent dosing. Less frequent dosing may also improve drug tolerability and patient adherence.

Our Pipeline

We are developing a portfolio of programs targeting specific biological mechanisms implicated in age-related diseases. Our core therapeutic approach targets cellular senescence, and we are currently advancing senolytic programs in musculoskeletal, ophthalmologic, and pulmonary disorders. Our clinical development strategy is to focus initially on the development of senolytic medicines designed to be administered locally into diseased tissue. After demonstrating efficacy in indications amenable to localized therapy, we plan to pursue the development of senolytic medicines that could be administered systemically to treat additional age-related diseases such as kidney disease, liver disease and neurological disorders. In addition to our efforts to eliminate senescent cells, we are also advancing other programs that have the potential to extend human healthspan, including the administration of α-Klotho hormone.

Our current pipeline of programs is illustrated below:

Within our cellular senescence programs, our lead senolytic molecules, UBX0101, UBX1325 and UBX1967, which are designed to remove accumulated senescent cells by means of local administration, are described below.

Musculoskeletal/Osteoarthritis Programs

UBX0101 is our lead drug candidate for musculoskeletal disease with an initial focus on osteoarthritis, or OA, of the knee. It is a small molecule inhibitor of the MDM2/p53 interaction. Disruption of this protein-protein interaction can trigger the elimination of senescent cells. In the fourth quarter of 2019, we initiated a Phase 2 study of UBX0101 in patients with painful, moderate-to-severe OA of the knee. As of mid-February 2020, this study was fully enrolled and we expect top-line results for 12- and 24-week endpoints in the second half of 2020. We also initiated a Phase 1b study to evaluate the safety, tolerability and initial effectiveness of both a higher dose and repeat doses of UBX0101 in the first quarter of 2020. We expect top-line results for 12- and 24-week endpoints from the Phase 1b study in the second half of 2020 and the first half of 2021, respectively. We own, co-own or have exclusively licensed worldwide rights for the use of UBX0101 for the treatment of OA. See "—Intellectual Property."

Ophthalmology Program

UBX1325 and UBX1967 are our most advanced lead drug candidates for age-related diseases of the eye, including age-related macular degeneration, diabetic macular edema and diabetic retinopathy. These drug candidates are both potent senolytic small molecule inhibitors of specific members of the Bcl-2 family of apoptosis regulatory proteins but have shown distinct pharmacokinetic profiles in our preclinical studies. UBX1325 and UBX1967 are designed to inhibit the function of proteins that senescent cells rely on for survival. In our preclinical studies, we have demonstrated that by targeting the Bcl-2 pathway UBX1325 and UBX1967 preferentially eliminate senescent cells while sparing non-senescent cells. We intend to complete Investigational New Drug, or IND, -enabling studies for both molecules prior to selecting the first molecule to advance into a first-in-human clinical study. As a result, we expect to initiate a Phase 1 study for this program in the second half of 2020 and receive top-line results from this study in 2021.We intend to explore multiple age-related eye diseases in our ophthalmology program

Under a license agreement with Ascentage Pharma Group Corp. Limited, or Ascentage, we have exclusive worldwide development and commercialization rights and non-exclusive manufacturing rights to UBX1967 outside of Greater China (China, Hong Kong, Macau and Taiwan) in all non-oncology indications Inside Greater China, we will be obligated to develop, manufacture and commercialize UBX1967 through a joint venture with Ascentage. We amended the UBX1967 license agreement in the fourth quarter of 2019 to remove certain field and territory limitations from a provision granting us exclusivity and to amend the schedule of licensed patents to include certain

additional patents relating to UBX1967 and again in the first quarter of 2020 to amend and restate the schedule of listed patents. The UBX1967 license agreement with Ascentage also grants us the right to continue our preclinical development efforts with UBX1325 until the time we wish to submit an IND for UBX1325. At that point we would be required to either enter into a separate license agreement with Ascentage covering UBX1325, the terms of which would mirror the UBX1967 license agreement, or substitute UBX1325 for UBX1967 under the existing license agreement. See "—Licenses and Collaborations."

Our Strategy

To achieve our objective of building UNITY into a leading healthspan company, we focus on two parallel efforts. First, we are committed to developing senolytic medicines that slow, halt, or reverse specific age-related diseases. Second, we dedicate resources and effort to better understanding fundamental aging mechanisms and translating these insights into human medicines. This pioneering work has been supported by valuable collaborations with leading academics. By investing early in the science of aging, we believe we are positioned to transition the field of aging biology from fundamental scientific insights to the development and commercialization of medicines. Our core strategies to achieve this objective include:

- ***Demonstrating in our clinical studies that local treatment with senolytic medicines can alter the course of age-related diseases***. We believe that local treatment with senolytic medicines has the potential to slow, halt, or reverse aspects of aging. If we prove this concept in a localized setting, we will be well-positioned to expand upon that success with additional applications.
- ***Continuing research into the development of systemic senolytic medicines***. We believe that harnessing the full potential of senolysis, or the selective elimination of senescent cells, to alter many age-related diseases will require systemic senolytic medicines. We are exploring the development of systemic senolytic medicines using multiple modalities, including small molecules and biologics.
- ***Targeting aging mechanisms beyond cellular senescence***. While senolysis has been shown to affect the course of multiple age-related diseases, we believe achieving our broader goal of extending human healthspan will require intervention in additional aging mechanisms beyond cellular senescence. We will continue to conduct fundamental research into these other aging mechanisms, including the administration of α-Klotho hormone. We will also continue to partner with the most forward-thinking aging researchers in the world to foster a collaborative environment to bring their insights, innovation and technologies into our powerful research and drug development infrastructure.
- ***Leveraging our core science and biotechnology experience***. We strive to attract, retain, and incentivize a unique team with significant strengths and experience in basic science, biotechnology, medicinal chemistry and clinical development. Over the last eight years, our team has identified multiple mechanisms that can selectively eliminate senescent cells, created potent senolytic molecules, and developed proprietary animal models to monitor senescent cell clearance. We have developed significant insight into the relationship between the accumulation of senescent cells and human disease. Further, our management team has extensive biotechnology and pharmaceutical experience and has played a leadership role in the creation of numerous FDA-approved medicines.
- ***Opportunistically expanding our product portfolio***. Our internal research has identified multiple biological pathways that are potential targets for age-related diseases. We will search for opportunities to in-license novel medicines that we rapid advance into clinical development. We expect that our current leadership in the field of cellular senescence biology will serve as a foundation for us to develop numerous products to treat human disease.
- ***Continuing to build a robust and defensible patent portfolio***. We are an innovative biotechnology company focused on developing novel insights into the biology of age-related diseases. Our current patent portfolio consists, on a worldwide basis, of more than 140 patents and pending applications in the United States and in foreign jurisdictions. This includes 36 issued and allowed U.S. patents and patent applications and 18 granted and allowed foreign patents and applications respectively. We intend to continue to aggressively develop, file and pursue additional patent protection for our innovative technologies and products.

Healthspan and Age-Related diseases

Age-related diseases such as arthritis, vision loss, pulmonary disease, and cognitive decline cause considerable economic, personal and societal burden. As individuals age, the prevalence of chronic disease increases, with 80% of older Americans having at least one chronic disease and 50% having two or more. This deterioration of health negatively impacts quality of life, and age-related diseases are typically chronic and persist from the time of onset until death.

Age-related diseases drive significant healthcare spending. It is estimated that providing healthcare for people over the age of 65 costs four to five times more than for younger individuals. The Centers for Medicare and Medicaid Services expect healthcare spending in the United States to exceed $5.2 trillion by 2025, which is equal to approximately 20% of the projected U.S. gross national product for the same year. According to the Centers for Disease Control and Prevention, the population of Americans aged 65 years or older is expected to nearly double by 2050, dramatically increasing the economic burden of aging. Moreover, age-related diseases have a detrimental impact on quality of life and older adults are often less optimistic about their future. Many of the 34 million family caregivers in the United States who support aging relatives experience a deterioration in their own health and well-being as a result.

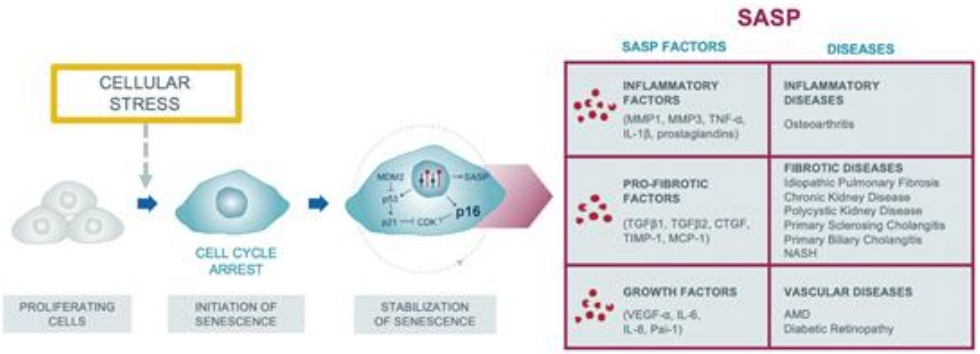
We believe that by creating medicines that target fundamental aging mechanisms, we can reduce the economic, personal, and societal burden of aging and enhance quality of life.

Our Approach to Extending Human Healthspan

Causes of Cellular Senescence

Cellular senescence is a natural biological state in which a cell permanently halts division. Cells become senescent when they experience some form of unresolvable cellular stress. These cellular stress events result in the activation of the tumor suppressor protein p53, which drives the production of two cell-cycle dependent kinase inhibitors, or CDK inhibitors, p21 and p16. These two molecules are required for the establishment and subsequent maintenance of the senescent cell state. The first CDK inhibitor to be produced is p21, which works through subsequent pathways to block the production of numerous proteins that cells need to divide. The initial p21-driven signal is an acute response to cell damage and eventually decreases. In contrast, p16 permanently locks the cell into a non-dividing state and the production of p16 continues as long as the cell lives. Given that p16 production, in most cases, continues indefinitely and is believed to be produced almost exclusively in senescent cells, it is a widely used marker to identify and quantify senescent cells.

The process through which stress mechanisms can induce cells to become senescent is illustrated in the figure below.



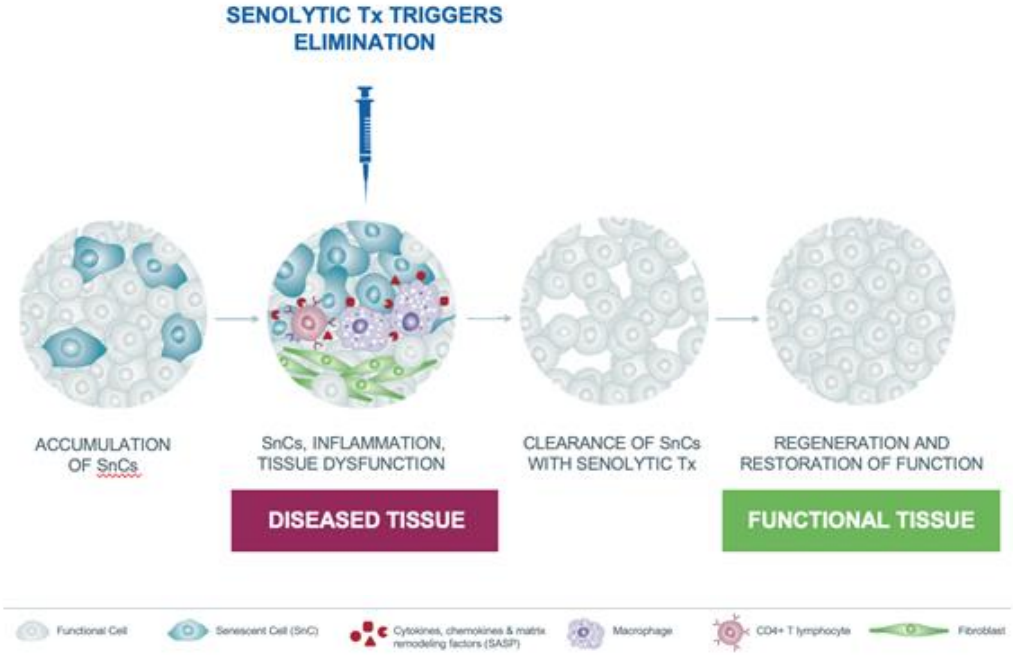
How Senescent Cells Drive Age-Related Diseases: The SASP

Once cells become senescent, they begin secreting large quantities of more than 100 proteins, including pro-inflammatory factors that recruit the immune system, proteases that remodel the extra-cellular matrix, pro-fibrotic factors that drive the formation of dysfunctional matrix, and growth factors that perturb the function of the tissue micro-environment. This collection of secreted proteins is referred to as the Senescence Associated Secretory Phenotype, or SASP. In addition to affecting normal tissue function, the SASP contains factors that induce senescence in neighboring cells, setting off a cascade of events that ultimately culminates in the formation of a functionally aged and/or diseased tissue that underlies a variety of age-related diseases.

Numerous SASP factors have been implicated as potentially contributing to human disease and it is now believed that the SASP is the primary means by which senescent cells drive specific age-related diseases. For example, a variety of single SASP factors (e.g., TNF-α and VEGF-A) have been demonstrated to drive human diseases by themselves and have been the target of well-known antibody therapeutics, including HUMIRA® and EYLEA®. While these antibodies are able to modify human disease by removing the activity of a single factor, we believe the clearance of senescent cells will remove the source of numerous SASP factors, providing improvement in both efficacy and duration-of-effect.

Our Therapeutic Paradigm

We were founded on the principle that the selective elimination of senescent cells and their accompanying SASP has the potential to slow, halt, or reverse age-related diseases. Our insights into senescent cell biology allow us to identify senescence-driven diseases, target the senescent cells driving a particular disease, and selectively eliminate these cells. The figure below illustrates this process.



In developing this approach, we have acquired significant expertise with respect to senescent cell survival pathways, which are the signaling systems that senescent cells rely on for survival. When these pathways are inhibited with specifically designed molecules, senescent cells undergo programmed cell death. Through our research, we have identified several of these mechanistically distinct survival pathways, which differ depending on cell type and the tissue in which the senescent cells reside.

Advantages of Our Approach

We believe that senolytic medicines—medicines that selectively eliminate senescent cells from diseased tissues—may have several advantages over other efforts to treat age-related diseases:

- ***Senolytic medicines target a root cause of age-related diseases.*** We believe that the accumulation of senescent cells is a root cause of many age-related diseases. Unlike treatments that inhibit the activity of a single factor (such as antibodies targeting single pro-inflammatory proteins), we believe a senolytic medicine that eliminates accumulated senescent cells and consequently also their associated SASP, could blunt the activity of numerous factors contributing to disease. As a result, senolytic medicines could have improved efficacy because they target diseases at their source and therefore may be able to normalize tissue levels of numerous disease-causing factors simultaneously.
- ***Senolytic medicines can be dosed intermittently***. The administration of senolytic medicines would remove senescent cells from diseased tissue. As new senescent cells may take months or even years to re-accumulate, senolytic medicines could potentially be dosed infrequently. We believe that intermittent dosing (rather than ongoing chronic dosing) could restore normal tissue function such that further drug administration would not be required until senescent cells have re-accumulated. Intermittent dosing may also improve drug tolerability and patient adherence when compared to chronic therapies.
- ***Senolytic medicines restore tissues to a healthy state.*** We believe senescent cells generally do not accumulate in young individuals and that the accumulation of senescent cells in older individuals interferes with normal tissue function. Our goal for the administration of senolytic medicines is to restore tissue to a functionally younger state.

Our Discovery and Development Strategy

We believe that each of our senolytic programs has the potential to address a root cause of an age-related disease. Our clinical development strategy is initially to develop senolytic medicines designed to be administered locally into diseased tissue (either by injection or inhalation), which reduces systemic toxicological risks by limiting drug exposure largely to the treated tissue. After demonstrating safety and efficacy in indications amenable to localized therapy, we plan to pursue the development of senolytic medicines that could be administered systemically, initially acting on specific tissues for which direct local administration is challenging. Ultimately, we envision the potential for systemic administration of senolytic medicines to selectively eliminate senescent cells throughout the body to treat age-related diseases that are not amenable to local treatment, such as kidney, liver, and heart disease. We are also developing medicines that act on aging mechanisms beyond cellular senescence, such as the administration of α-Klotho hormone.

Cellular Senescence Biology Program

Musculoskeletal/Osteoarthritis Programs

Unmet Need and Therapeutic Rationale

Diseases of the musculoskeletal system represent one of the leading causes of disability in the world, particularly among the aging population. According to the 2015 World Health Organization World Report on Ageing and Health, musculoskeletal diseases account for the most time those over age 50 in the developed world spend living with a disability. To date, senescence has been linked with osteoarthritis of the knee, hip, and intervertebral (spine) facet joints, degeneration of intervertebral discs, and loss of bone density.

Osteoarthritis, or OA, is a degenerative disease that negatively impacts all tissues of the joint including cartilage, the synovial tissue that encapsulates the joint, and the subchondral bone, causing pain and physical impairment. The effect of tissue degeneration causes the normally smooth joint cartilage to become fragmented and pitted, the synovial tissue to become inflamed and thickened, and the bone to develop abnormal morphology, all of which leads to a decrease in joint function and mobility. OA is a highly prevalent disease, symptomatically affecting as many as 10% to 15% of the world's population over age 60, and results in a decline in quality of life. The most common joint affected by OA is the knee, followed by the hip, ankle, and shoulder. Importantly, the current standard of care begins with symptomatic treatment that temporarily addresses joint inflammation or controls pain. The natural progression of treatment often results in joint replacement surgery. Based on data from the Agency for Healthcare Research and Quality (a division of the U.S. Department of Health and Human Services) for 2009, the aggregate cost of knee and hip replacements in the United States was $42.3 billion. It is estimated that in 2010, nearly 7 million individuals in the United States were living with total hip or total knee replacements. The overall cost of OA is estimated to be greater than $150 billion per year in the United States.

OA of the knee is believed to be a heterogeneous and multifactorial disease. We believe that the accumulation of senescent cells and associated SASP are significant contributing factors in OA disease. A number of SASP factors are secreted by senescent cells into the tissue and/or synovial fluid surrounding an affected joint, including (i) cytokines and chemokines which may cause inflammation, such as the interleukins IL-1ß and IL-6; (ii) proteases and protease inhibitors, which may cause tissue degradation, such as MMP-1, MMP-3 and MMP-13; and (iii) growth factors and adhesion molecules, which may lead to tissue remodeling, such as VEGF-C and ICAM-1. The presence and concentrations of these SASP factors may vary based on the tissue and fluid type, however we believe these SASP factors lead to cartilage loss, inflammation of the synovial membrane, bone abnormalities, degeneration of the joint cartilage and pain.

Evidence for Cellular Senescence Burden in Human OA Disease and Human Biomarker Discovery

To evaluate the link between cellular senescence, SASP accumulation and OA disease, we conducted a non-interventional biomarker study in 30 patients with primary OA of the knee. Immunohistochemistry, or IHC, of the sampled tissue demonstrated p16-positive cells in a number of cell types within the synovial membrane. The degree of senescence was quantified in these samples by measuring the percentage of p16 positive cells relative to the total cell number in the specimen. Several significant findings were identified from this study. First, the extent of senescence in the synovial membrane from each patient showed statistically significant correlation to the amount of pain each of those patients experienced, as measured at the start of the study using the Western Ontario and McMaster Universities Arthritis Index, or WOMAC, pain sub-scale (WOMAC-A), a commonly used standardized pain measure. Second, the extent of senescence in the synovial membrane, including in specific individual areas within the knee, showed statistically significantly correlation with the magnetic resonance imaging, or MRI, based synovitis score that evaluates 11 different regions within the knee. Finally, a relationship trend was identified when assessing the correlation between the extent of senescence and the grade of disease based on the Kellgren Lawrence, or KL, grade. When evaluating the relationship in patients with mild to moderately severe disease (KL grades 1-3), this relationship was statistically significant.

Mechanism of Action of UBX0101

UBX0101 is a small molecule inhibitor of the MDM2/p53 protein-protein interaction. The tumor suppressor p53 is a transcription factor that regulates a broad set of genes that control cellular functions including cell cycle arrest, cell death (or apoptosis), and senescence. MDM2 is a protein-ubiquitin ligase that marks proteins for destruction. UBX0101 binds to MDM2, raising p53 levels which in turn, we believe, causes the elimination of senescent cells.

UBX0101 Development

Phase 1 Results

In the second quarter of 2019, we reported results from a Phase 1 clinical study of UBX0101 in patients with painful, moderate-to-severe OA of the knee. The Phase 1 clinical study was randomized, double-blind and placebo-controlled and evaluated the safety, tolerability and pharmacokinetics of a single intra-articular injection of

UBX0101 in patients diagnosed with painful, moderate-to-severe painful OA of the knee. In the first portion of the study, the single ascending dose, or SAD portion, 48 patients were randomly assigned to receive one of six dose levels of UBX0101 (between 0.1 mg to 4.0 mg) or placebo in a 3:1 randomization. Primary endpoints were safety and tolerability. Secondary and exploratory endpoints included plasma pharmacokinetics, synovitis as measured by MRI, pain as measured using both the Numeric Rating Scale, or NRS (0-10 point scale) and the WOMAC-A scale (0-4 point scale), and measurement of SASP factors and disease-related biomarkers present in synovial fluid and plasma.

In the second portion of the study, a biomarker assessment, 30 patients were randomized to receive UBX0101 (4.0 mg dose) or placebo in a 2:1 randomization. Primary endpoints were safety and tolerability. Secondary and exploratory endpoints included changes in the levels of SASP factors and disease-related biomarkers present in synovial fluid and plasma, and pain. Synovial fluid samples were obtained at baseline and four weeks post-treatment. UBX0101 was well-tolerated up to the maximum administered dose of 4.0 mg.

Across both portions of the study, there were no serious adverse events and no patients discontinued because of an adverse event. There were no dose-dependent adverse events or relevant clinical laboratory findings. The majority of adverse events were mild and there were no relevant clinical laboratory findings.

In the SAD portion of the study, evaluation of pain by NRS, measured at 12 weeks, demonstrated a dose-dependent and clinically meaningful reduction. The range of mean baseline values was between 5.90 to 6.76 (Figure 1A).

	NRS	
	CFBL	**Pbo-Adj**
Placebo (n=14)	-1.96	NA
Low doses (n=16)	-2.66	-0.65 (p = 0.42)
High doses (n=18)	-3.95	-1.98 (p < 0.01)

(Figure 1A). CFBL=change from baseline; Pbo-Adj=placebo adjusted; low doses=0.1, 0.2, and 0.4 mg; high doses=1.0, 2.0, and 4.0 mg

In the SAD portion of the study, evaluation of pain by WOMAC-A mean item score, measured at 12 weeks, demonstrated a dose-dependent and clinically meaningful reduction. The range of mean baseline values was between 1.80 to 2.36 (Figure 1B).

	WOMAC-A	
	CFBL	**Pbo-Adj**
Placebo (n=14)	-0.74	NA
Low doses (n=16)	-0.49	+0.23 (p = 0.43)
High doses (n=18)	*-1.09*	*-0.41 (p = 0.07)*

(Figure 1B). CFBL=change from baseline; Pbo-Adj=placebo adjusted; low doses=0.1, 0.2, and 0.4 mg; high doses=1.0, 2.0, and 4.0 mg

In addition, 100% of patients receiving the 4.0 mg dose reached a clinically meaningful reduction of mean item score of 0.5 and 50% of such patients achieved a reduction of mean item score of greater than 1.5.

In the biomarker portion of the study, evaluation of pain by WOMAC-A mean item score, measured at 4 weeks, showed a numerical reduction that was not significantly different from placebo.

In the SAD portion of the study, evaluation of function by WOMAC-C mean item score (0-4 point scale) demonstrated a dose-dependent and clinically meaningful improvement. The range of mean baseline values was between 1.40 to 2.47 (Figure 1C).

	WOMAC-C	
	CFBL	**Pbo-Adj**
Placebo (n=14)	-0.72	NA
Low doses (n=16)	-0.49	+0.22 (p = 0.43)
High doses (n=18)	-1.05	-0.35 (p = 0.13)

(Figure 1C). CFBL=change from baseline; Pbo-Adj=placebo adjusted; low doses=0.1, 0.2, and 0.4 mg; high doses=1.0, 2.0, and 4.0 mg

In the biomarker portion of the study, evaluation of function by WOMAC-C measured at four weeks showed a numerical reduction that was not significantly different from placebo.

Evaluation of stiffness by WOMAC-B mean item score (0-4 point scale) in both the SAD and biomarker portions of the study resulted in no significant differences between UBX0101 and placebo in changes in stiffness. In the SAD portion of the study, patients were also evaluated using a patient global impression of change measurement which is a summary measure of treatment benefit from the perspective of the patient measuring their perception of improvement or worsening of their condition. A higher proportion of patients reported being “much improved” or “very much improved” versus placebo (placebo = 42.9%, low doses = 50.0%, high doses = 61.1%).

In both portions of the study, patients underwent knee MRI imaging with contrast enhancement and arthroscopy in order to evaluate synovial inflammation. No statistically significant change at any dose level was demonstrated as compared to placebo.

In the SAD portion of the study, an insufficient number of matched samples were collected due to a lack of adequate levels of synovial fluid in patients for sampling. Therefore, an analysis of change in biomarkers from baseline to 12 weeks was not performed. In the biomarker portion of the study, 19 biomarkers were analyzed across 20 matched pair samples. In approximately half of the biomarkers measured in synovial fluid (treatment versus placebo) modulation was observed consistent with elimination of senescent cells and the potential improvement in the tissue environment. Changes were observed in MMPs, tissue remodeling factors, and inflammatory cytokines. These biomarkers were: MMP-3, MMP-10, MMP-12, MMP-13, IL-6, IL-10, CCL20 (MIP-3a), CCL19 (MIP-3b), a2M, ICAM-1 and VEGF-C.

Phase 2 Study

In the fourth quarter of 2019, we initiated a Phase 2 study of UBX0101 in patients with painful, moderate-to-severe OA of the knee. As of mid-February 2020, this study was fully enrolled and we expect top-line results for 12- and 24-week endpoints in the second half of 2020. The study is randomized, double-blind, and placebo-controlled and will evaluate three doses (0.5 mg, 2.0 mg and 4.0 mg) of UBX0101 administered via a single intra-articular injection. The primary measure is an assessment of pain at 12 weeks using the WOMAC-A instrument. Secondary measures will include safety and tolerability, pain (by NRS) and function (by WOMAC-C) at 12 weeks, as well as all four measures at 24 weeks.

Phase 1b Study

In the first quarter of 2020, we initiated a Phase 1b study of UBX0101 in patients with painful, moderate-to-severe OA of the knee to evaluate the safety, tolerability and initial effectiveness of both a higher dose and repeat doses. We intend to enroll approximately 36 patients and expect top-line results for 12- and 24-week endpoints from the second half of 2020 and the first half of 2021, respectively. This Phase 1b study is randomized, double-blind, and placebo-controlled and will evaluate an 8.0 mg dose of UBX0101 administered via a single intra-articular injection as well as two 4.0 mg doses of UBX0101 administered via intra-articular injection one month apart. The primary measures will be safety and tolerability. Secondary measures will include pain (using both the WOMAC-A and NRS instruments) and function (by WOMAC-C) at 12 weeks, as well as similar measures at 24 weeks.

Ophthalmology Programs

Unmet Need and Therapeutic Rationale

The majority of significant eye diseases are age-related, with the prevalence of vision-threatening disease increasing significantly over the age of 75. Of the 285 million individuals worldwide living with visual impairment, 65% are over the age of 50. The individual diseases that are associated with these figures include age-related macular degeneration, and diabetic eye diseases, all of which have a high prevalence and significant unmet need in either prevention or therapeutic options. The diseases we are evaluating as initial target indications for local administration of senolytic therapy in the eye are age-related macular degeneration, diabetic macular edema and diabetic retinopathy.

Age-Related Macular Degeneration

Age-related macular degeneration, or AMD, is the leading cause of irreversible vision loss in people over the age of 65 in the United States, where, in 2010, there were an estimated 1.8 million people with AMD. The total number of AMD cases in the United States is projected to more than double by 2050, reaching 5.4 million. The prevalence of AMD increases significantly with advancing age, with a prevalence rate of 1.63% in those aged 65 to 69 years which increases to 11.73% in those aged 80 years or older. AMD affects central vision, impairing functions such as reading, driving, and facial recognition, and has a major impact on quality of life and the ability to live independently. AMD is defined in three stages: (i) “early,” in which visual function is affected in the presence of signs of age-related changes in the retina such as drusen and pigmentary changes; (ii) “intermediate,” in which increasing degrees of macular lipid deposition and structural changes are noted; and (iii) “late,” in which central vision is compromised due to abnormal blood vessel growth (known as “wet” AMD) or advanced atrophy of the retina (known as “dry” AMD). AMD is a heterogenous, complex, multifactorial disease, with inflammatory, degenerative, genetic, and vascular factors all contributing to its development and progression. The potential role of senescent cells and the associated SASP in driving the two main presentations of the disease, both wet and dry forms, could prove a unifying mechanism across this complex disorder.

Standard of care for AMD is limited to anti-vascular endothelial growth factor, or anti-VEGF, drugs which control aspects of the wet form of the disease only. The development of therapeutic options for dry AMD has proven to be challenging and currently there are no approved therapies available to slow progression or reverse disease. And while wet AMD has been significantly impacted by anti-VEGF therapy, that approach is limited by the need for frequent, eye injections over a long period of time, a significant percentage of patients not completing or being non-responsive or poorly-responsive to anti-VEGF therapy, and the contribution of multiple other mechanisms at play in the disease beyond VEGF. Thus, there is considerable potential for a senolytic approach to impact disease progression and achieve stabilization in AMD via modulation of senescent cell burden and the accompanying SASP. SASP factors in AMD include molecules that promote abnormal blood vessel growth, inflammation, and fibrosis, all of which have been implicated in various stages of the disease. We believe that a senolytic medicine could have a meaningful and prolonged impact on the AMD disease state and help restore the cellular microenvironment to a more normal, pre-senescent state.

Diabetic Macular Edema

Diabetic macular edema is a condition in which high levels of blood glucose, or hyperglycemia, damage blood vessels in the central portion of the retina, or the macula, causing those vessels to leak fluid. The leaking fluid leads to swelling and subsequently to abnormalities of vision. The prevalence of diabetic macular edema, or DME, in the U.S. ranges from approximately 4.0% to 6.8% of people with diabetes who are 40 years of age or older. In 2010, it was estimated that 745,000 patients had DME. There is a high burden of DME among non-Hispanic blacks and robust associations with higher hemoglobin A1c and longer duration of underlying diabetes.

Because the prevalence of DME increases with increasing duration of hyperglycemia, macular edema is more likely to be found in eyes of patients who have a longer interval between the onset of diabetes and its discovery. Lower frequency of DME is expected in people who are diagnosed with diabetes by routine screening which is likely due to the fact that these people are closer to the time of “onset” of their diabetes than symptomatic patients who are known to have had type 2 diabetes for a number of years.

Despite the success achieved with anti-VEGF treatment for retinal disease like AMD that involve the proliferation of abnormal blood vessels, or neovascularization, in DME, the impact of this therapeutic approach has been more limited. This is due to the challenging nature of the therapeutic regimen (which entails monthly and or bimonthly IVT injections for at least a year), the number of cases that are refractory to anti-VEGF treatment (50% of DME patients), and the long-term complications of increased ischemia and retinal fibrosis associated with long-term treatment with anti-VEGF injections. As a result, there is an unmet need in this group of patients. Although VEGF has been identified as a major factor for neovascular disease, other factors, which we believe include SASP factors, are present in DME, including IL-1ß, TNF-a, IL-6, and TGF-ß, among others. Due to the multifactorial nature of the disease, a significant opportunity exists to develop a more comprehensive approach to the treatment of DME, such as senolysis, that targets the root cause of the disease.

Diabetic Retinopathy

Diabetic retinopathy, or DR, is estimated to affect over 90 million people globally and approximately 28 million have vision-threatening stages of disease. It is a leading cause of vision loss in middle-aged and elderly people and impacts 8% of the U.S. population over age 65. Due to the increasing diabetic population arising from lifestyle changes in developing countries, the disease incidence is predicted to climb.

Diabetic retinopathy is a complex multifactorial disease, characterized by progression through a series of stages of increasing severity. High glucose levels incite a variety of inflammatory and metabolic stress-induced events which leads to proliferation of new blood vessels and subsequent bleeding and swelling, which in turn causes visual loss or may lead to damaged blood vessels in which blood flow is blocked, leading to damage to the retinal photoreceptors and nerves supplied by those vessels. The risk of developing diabetic retinopathy and its severity increase with the duration of underlying diabetes. It is also associated with poor glycemic control and the presence of additional coexistent diseases, such as high blood pressure, high cholesterol levels, and impaired kidney function.

Current standard of care for diabetic retinopathy, which includes blood sugar control, anti-VEGF drugs, steroid injections, and laser therapy, is modestly effective. The limitations of existing therapy include general challenges with achieving diabetes control, the need for frequent intra-vitreal injections for the administration of anti-VEGF therapy, a significant percentage of patients not completing or being non-responsive to anti-VEGF therapy, and tissue destruction with permanent side effects from laser therapy. This presents a significant opportunity to design and develop a treatment paradigm, such as senolysis, that treats a root cause of the disease.

Evidence suggests that diabetic retinopathy is driven by the accumulation of senescent cells that are a direct result of elevated glucose levels in patients with diabetes. These senescent cells are triggered by local stresses in the retina and their accumulation drives the production of the accompanying ocular SASP factors, VEGF and platelet-derived growth factor, or PDGF. Overproduction of VEGF and IL-6 leads to ocular inflammation and abnormal blood vessel growth, key signatures of diabetic retinopathy. Thus, a senolytic approach could target multiple aspects of the underlying causes of diabetic retinopathy and ideally lead to greater therapeutic coverage in a wider range of patients. This elimination of senescent cell accumulation and accompanying SASP factors could limit further disease progression, reduce vessel leakage and inflammation, and prevent vision loss.

Evidence for Senescence Burden in Human Disease and Human Biomarker Discovery: AMD, DR and DME

We evaluated the presence of senescent cells in retinal donor tissue from normal verses AMD and DR/DME subjects by IHC staining for p16. We believe the resulting data support our hypothesis that the accumulation of senescent cells is linked to AMD and DR/DME. Quantification of IHC images indicated a significant increase in senescent cell burden (as measured by $p16^{+}$ cells) in both AMD and DR patient globes (Figure 2).

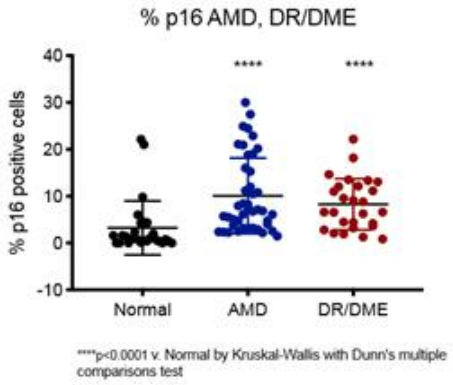


Figure 2. Quantification of senescent cell burden in AMD and DR/DME

We also compared the presence of senescence in human retinal microvascular endothelial cells, or HRMEC, verses retinal donor tissue from human DME/DR patients by evaluating the gene expression of several disease-relevant factors. Quantitative polymerase chain reaction, or qPCR, demonstrated elevations in the SASP factors VEGF, PDGF, IL1B, and TNF in senescent HRMEC, relative to non-senescent cells. These disease-relevant mediators have been reported to be elevated in DME/DR patients. We believe this data is consistent with our hypothesis that senescent cell accumulation and SASP factors play a central role in both DME and DR.

Mechanism of Action of UBX1325 and UBX1967 (Inhibitors of the Bcl-2 Family)

UBX1325 and UBX1967, the lead drug candidates in our ophthalmology program, are potent small molecule inhibitors of specific members of the Bcl-2 family of regulator proteins. The B-cell lymphoma 2, or Bcl-2, gene family encodes more than 20 proteins that regulate the intrinsic apoptosis pathway and are fundamental to the balance between cell survival and cell death. Inhibition of certain Bcl-2 family proteins results in cell death. Targeting this pathway has been studied extensively in connection with the search for new oncology medicines.

In Vitro and In Vivo Pharmacology Studies with UBX1325

We conducted an *in vitro* assessment of binding and efficacy of UBX1325 to determine both its potency for the Bcl-2 family protein targets and its potency at eliminating senescent cells. Biochemical assays for Bcl-2, Bcl-xL, and Bcl-w yielded binding affinities in the sub-nanomolar range. UBX1325 is a phosphate pro-drug that releases the active parent molecule known as UBX0601. In order to assess the activity of UBX0601 on senescent cells, we used a cell-based assay with radiation-induced senescence. Senescent cells were exposed to increasing concentrations of UBX0601 for 72 hours. In this study, UBX0601 showed potent, concentration-dependent senolytic activity against human foetal lung cells, or IMR90, primary human umbilical vein endothelial cells, or HUVEC, and HRMEC as measured by reduction of senescent cell survival. UBX0601 also demonstrated selectivity for elimination of senescent HRMEC over non-senescent HRMEC which is observed as decreased potency in the non-senescent HRMEC (Figure 3).

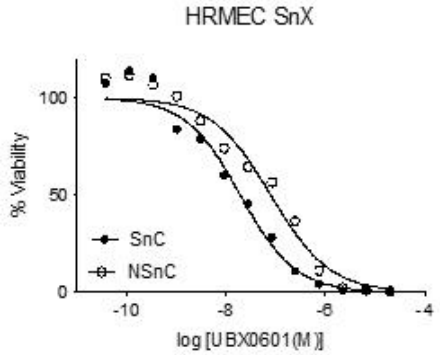


Figure 3. Concentration- dependent induction of apoptosis in HRMEC cells by UBX0601

We next studied the effects of UBX1325 in the retina in an *in vivo* model. We employed the mouse oxygen-induced retinopathy, or OIR, model, which provides an *in vivo* model of retinopathy of prematurity, or ROP, and DR. In this model, UBX1325 showed statistically significant improvement in the degree of neovascularization (Figure 4).

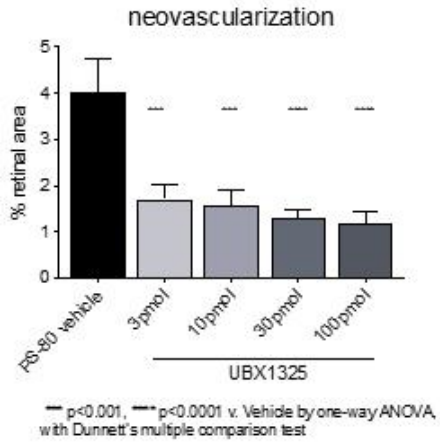


Figure 4. Intravitreal injection of UBX1325 reduced retinal neovascularization in the mouse OIR model

Based on these results in this key OIR model, we believe a single ocular injection of UBX1325 has the potential to functionally inhibit neovascularization and promote vascular repair. We believe the efficacy of UBX1325 in this OIR model is due to elimination of senescent cells and accompanying SASP that propagates senescence in retinal cells and promotes neovascularization of retinal vessels.

We then studied the *in vivo* efficacy of UBX1325 in a streptozotocin-induced diabetic mouse, or STZ, model to understand its effects in a diabetic retina, which shows phenotypes similar to the human diseased condition. In this STZ model, UBX1325 demonstrated a significant reduction in vascular leakage as measured by Evans Blue dye permeation (Figure 5A). UBX1325 also demonstrated an improvement in the electroretinogram, or ERG, as a measure of retinal/photoreceptor function (Figure 5B). At a dose of 200 pmol delivered per eye, UBX1325 led to significant increase in the amplitude of both the A- and B-waves ($p<0.01$ and $p<0.0001$, respectively) of the ERG when compared to the vehicle control group. Lastly, the expression of several disease-relevant cytokines were elevated in the diabetic retina, but attenuation of those factors was not observed after administration of UBX1325.

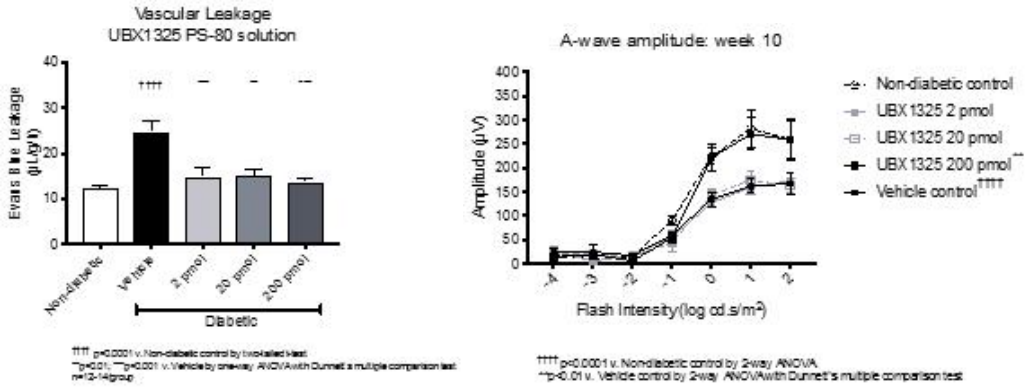


Figure 5. Streptozotocin-induced diabetic mice have increased retinal vascular leakage (5A) and decreased A-wave amplitude in ERG (5B). Administration of UBX1325 attenuated each of these disease-relevant endpoints.

We are in the final phases of IND-enabling non-clinical toxicology studies of UBX1325 to evaluate its safety and tolerability. Manufacturing and testing of UBX1325 to support the initiation of clinical studies of UBX1325 is nearing completion.

In vitro and in vivo Pharmacology Studies with UBX1967

We conducted an *in vitro* assessment of binding and efficacy of UBX1967 to determine both its potency for the Bcl-2 family protein targets and its potency at eliminating senescent cells. In order to assess the activity of UBX1967 on senescent cells, we used a cell-based assay with radiation-induced senescence. Senescent cells were exposed to increasing concentrations of UBX1967 for 72 hours. In this study, UBX1967 showed potent, dose-dependent senolytic activity against IMR90 and HRMEC as measured by reduction of senescent cell survival. UBX1967 also demonstrated selectivity for elimination of senescent HRMEC over non-senescent HRMEC which is observed as decreased potency in the non-senescent HRMEC (Figure 6).

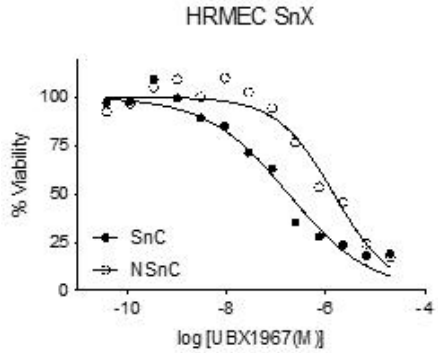


Figure 6. Concentration- dependent induction of apoptosis in HRMEC cells by UBX1967

We next studied the effects of an intervitreal injection of UBX1967 in the retina in the mouse OIR *in vivo* model which provides an *in vivo* model of ROP and DR. In this model, UBX1967 showed statistically significant improvement in the degree of neovascularization at all dose levels (Figure 7).

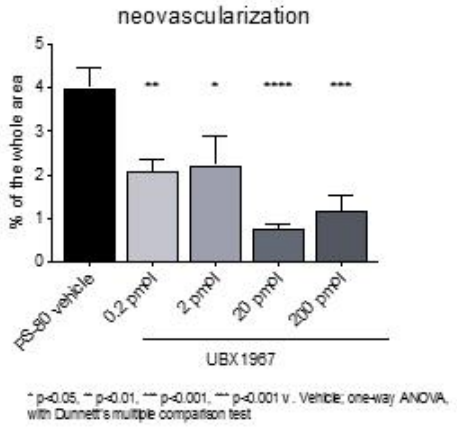


Figure 7. Intravitreal injection of UBX1967 reduced retinal neovascularization in the mouse OIR model

Based on these results in this key OIR model, we believe a single ocular injection of UBX1967 has the potential to functionally inhibit pathogenic angiogenesis and promote vascular repair (Figure 8). We believe the efficacy of UBX1967 in the OIR model is due to elimination of senescent cells and accompanying SASP that propagates senescence in retinal cells and promotes neovascularization of retinal vessels.

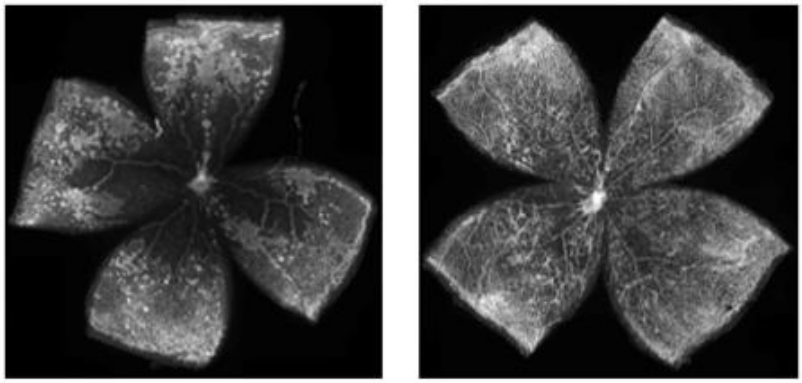


Figure 8. Representative images from mouse OIR illustrate the reduction in neovascularization and vaso-obliteration after treatment with UBX1967

We then studied *in vivo* efficacy of UBX1967 in the STZ mouse model to understand its effects in a diabetic retina. In this model, UBX1967 demonstrated a reduction in vascular leakage as measured by Evans Blue dye permeation. Administration of UBX1967 significantly reversed leakage in the DMSO-based formulation ($p<0.01$) and demonstrated dose-dependent reversal in the PS-80-based formulation, although not statistically significant. UBX1967 also demonstrated an improvement in the ERG at all doses. At dose levels of between 2 – 200pmol delivered per eye, UBX1967 led to significant increase in the amplitude of both the A- and B-waves ($p<0.001$ and $p<0.0001$, respectively) of the ERG when compared to the vehicle control group. The ERG amplitudes of UBX1967-treated groups were not significantly different from the non-diabetic control animals.

Finally, UBX1967 demonstrated a dose dependent reduction in the expression of several disease-relevant cytokines, namely *IL1B* (2 – 200pmol) and *TNF* mRNA ($p<0.05$ v. vehicle control) in the diabetic retina.

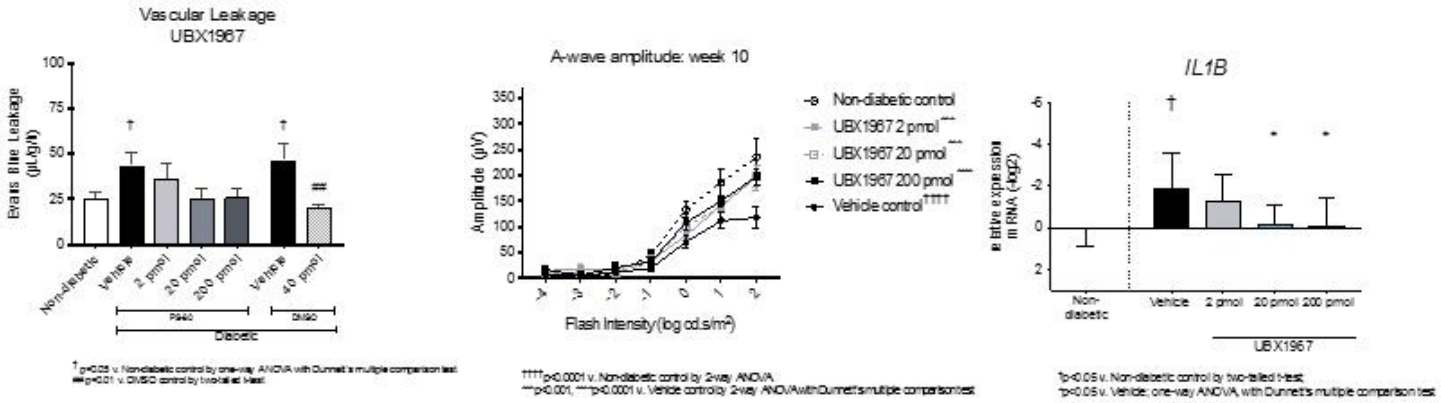


Figure 9. Streptozotocin-induced diabetic mice have increased retinal vascular leakage (9A), decreased A-wave amplitude in ERG (9B), and increased cytokine expression (9C). Administration of UBX1967 attenuated each of these disease-relevant endpoints.

We are in the final phases of IND-enabling non-clinical toxicology studies of UBX1967 to evaluate its safety and tolerability. Manufacturing and testing of UBX1967 to support the initiation of clinical studies of UBX1967 is nearing completion.

Ophthalmology Development Plan

UBX1325 and UBX1967 are currently in the final phases of IND-enabling non-clinical toxicology studies. Both senolytic molecules are inhibitors of particular members of the Bcl-2 family of apoptosis regulatory proteins which have shown distinct pharmacokinetic profiles in preclinical studies. UNITY intends to complete IND-enabling studies for both molecules prior to selecting the first molecule to advance to a first-in-human study to explore safety and tolerability of this novel mechanism of action for age-related eye diseases. UNITY expects to initiate a Phase 1 safety study for this program in the second half of 2020 and receive top-line results from this study in 2021. The overall clinical program is directed at multiple age-related diseases of the eye, such as age-related macular degeneration, diabetic retinopathy and diabetic macular edema.

As part of our continued commitment to our ophthalmology indications, we also continue to design alternative senolytic molecules with differing mechanisms of action. We are also focused on the physiochemical properties of our small molecules and are developing approaches to optimize solubility, permeability, and pharmacokinetic, or PK, parameters to create favorable ocular absorption, distribution, metabolism, and residency profiles.

Pulmonary Programs

Unmet Need and Therapeutic Rationale

Data from the World Health Organization from 2015 shows that respiratory diseases make up three of the top five causes of death worldwide, several of which are prevalent in the elderly. In addition, the National Heart, Lung, and Blood Institute of the U.S. National Institutes of Health published a white paper in 2017 highlighting the association of age with lung disease, including idiopathic pulmonary fibrosis, or IPF, and chronic obstructive pulmonary disease, or COPD, and underscoring the potential for understanding and developing therapeutics related to aging biology.

Historically, therapies for these diseases have been non-specific in their mode of action, whether anti-inflammatory (e.g., corticosteroids), or immunosuppressive (e.g., cyclophosphamide), or purely supportive in nature (e.g., supplemental oxygen). Increasingly, new therapies have been developed that are more targeted to specific pathogenic factors, such as anti-IL-5 antibody (mepolizumab) in COPD and tyrosine kinase inhibitor (nintedanib) in IPF. In contrast, the goal of senolytics is not just to interrupt specific pathogenic pathways but specifically to target senescent cells and thereby inhibit multiple pathogenic pathways.

We initiated an active discovery and development program in IPF based on a series of observations including the aggressive nature of the disease and data suggesting a potentially strong association between IPF and senescence.

IPF is a severely debilitating fibrotic disease of the lung that primarily affects older adults and often leads to a progressive worsening of lung function, eventually leading to respiratory failure or lung transplantation. Increasing organ fibrosis causes a restriction of ventilation that symptomatically is perceived as a constant experience of suffocation. While the course of the disease is variable, the prognosis is uniformly poor with a median survival of about three to four years after diagnosis. In the United States, it is estimated to affect up to 90,000 people, with approximately 40,000 people dying each year. While the overall prevalence is not high, it increases substantially in people over the age of 65. The hypoxemia resulting from IPF ultimately necessitates the use of supplemental oxygen. Supplemental oxygen relieves shortness of breath and improves functional status and may play a role in ameliorating associated comorbidities such as secondary pulmonary hypertension. However, the use of supplemental oxygen requires equipment for administration that can place significant burden on patients, limiting their mobility and profoundly reducing quality of life.

Beyond the use of oxygen, there are two marketed products that were more recently made available for the treatment of IPF, nintedanib and pirfenidone, that are recommended by the American Thoracic Society. In clinical studies, these anti-fibrotic agents slowed the rate of decline in lung function over 52 weeks but did not show a significant effect on survival or disease exacerbations. IPF remains a fatal disease for which additional effective therapies that treat the underlying lung fibrosis to improve quality of life and survival are needed.

Resident cell types within the lung, including epithelial cells and macrophages, have been shown to become senescent. Accumulation of these senescent cells followed by SASP secretion may drive IPF disease exacerbation and progression. In the case of senescent lung cells, we believe that the SASP is characterized in part by pro-fibrotic factors such as connective tissue growth factor CTGF and TGF-β. We believe that excessive and prolonged exposure to these factors leads to remodeling of the lung, expansion of lung matrix, and fibrosis, all of which deteriorate function and ultimately result in death. Furthermore, these factors may also play a role in suppressing the endogenous capacity of the lung to demonstrate regenerative capacity that has been shown in patients after removal of diseased lung tissue, as well as during recuperation of those patients who survive Acute Respiratory Distress Syndrome, an injury that severely damages the lung.

Evidence for Cellular Senescence Burden in Human Disease and Human Biomarker Discovery

Our exploratory work in IPF resulted in the identification of senescent cells associated with areas of active disease in lung tissue taken from patients with IPF. IHC staining for p16 in human IPF lung tissue demonstrated the presence of senescent cells. These cells were predominantly epithelial in origin and located in areas of fibrosis and at the leading edge of the disease, adjacent to areas of more normal lung tissue. These sites are likely amendable to access by inhalation therapeutics.

Importantly, the number of p16 positive cells was greater across all levels of fibrosis relative to that of normal tissue ($p<0.0001$ for group difference among means by one-way analysis of variance, or ANOVA). Additionally, there was a strong relationship between the extent of disease in a given area and the percentage of senescent cells present in those areas. At its peak, approximately 30% of the total cellularity in an affected region is comprised of senescent cells. These data support the hypothesis that elimination of senescent cells and its associated SASP could halt progressive fibrosis and potentially allow for restoration of pulmonary function. This further supports our hypothesis that IPF is related to SASP proliferation and suggests that treatment with senolytic molecules has the potential to treat the root cause of disease.

Preclinical Disease Model of Lung Fibrosis

We are currently exploring the efficacy of a senolytic mechanism in relevant *in vivo* models of fibrotic lung disease. Following local delivery, our lead molecule exhibits dose-dependent target engagement and subsequent induction of the apoptotic cascade in the mouse. Consistent with the *in vivo* activity, the nonclinical PK demonstrates acceptable lung restriction with minimal systemic exposure. Finally, we've conducted exploratory safety assessment in two animal species with acceptable non-clinical safety and tolerability.

Development Plan in Pulmonary Diseases

We intend to advance our lead development candidate, an inhaled senolytic molecule for pulmonary indications, into IND-enabling studies and, subject to the acceptance by the FDA of an IND for such candidate, into human clinical trials. While IPF is currently our lead indication, we are also exploring inhaled administration opportunities in other lung diseases, such as pulmonary arterial hypertension, and in obstructive airway diseases such as COPD.

We expect our integrated pulmonary development plan will utilize patient safety data and pharmacological dose responses from the initial clinical study to accelerate the design of next-generation clinical studies in other pulmonary diseases. We expect that a Phase 1 program in any of these diseases would closely parallel our work in IPF and would take advantage of any learnings regarding pharmacokinetics following inhaled administration as well as biomarker and imaging responses. This approach should allow us to lay additional groundwork for a broader range of pulmonary diseases once we demonstrate the safety, tolerability, and pharmacodynamics of inhaled senolytic administration.

Research and Discovery – Other Anti-Aging Programs

We have secured our lead position in the discovery and development of senolytic medicines through our commitment to fundamental biological research and translational science. We have partnered with key academics and thought leaders to pursue areas of emerging aging science. We continue to recruit top-tier scientists with the desire and drive to understand, uncover, and invent. We invest a significant proportion of our resources and effort in emerging fields of aging science in order to transition fundamental scientific observations to the design and development of new therapeutics. We believe that we have built the internal research capabilities and scientific network to continue to be at the forefront of extending human healthspan.

Strategy for Systemically Administered Senolytic Medicines

In addition to our discovery and development of locally administered senolytic medicines for the treatment of local disease, we are similarly investigating the systemic administration of senolytic medicines for the treatment of senescent cell-driven disease within specific organs, tissues, and cell types that are not amenable to local treatment.

Our first approach to systemic administration is to create a senolytic medicine that is designed to target a specific organ or even specific tissue within that organ. Such a senolytic medicine would selectively eliminate senescent cells within a tissue and reduce the SASP within that tissue. In considering therapeutic areas with unmet need and where there is strong evidence for the role of senescent cells driving disease, we are evaluating liver and kidney disease as well as neurological disorders.

Our long-term goal is to use the principles that we establish for the design of systemically administered, targeted senolytic medicines to produce a pipeline of clinical candidates to eliminate senescent cells throughout the body. This could draw on ideas from immunology, senolytic viruses, vaccines, CAR-T type approaches or antibody drug conjugates.

α-Klotho Hormone

We are also evaluating the administration of α-Klotho hormone in age-related diseases. First discovered in 1997, the *klotho* gene was identified in mice as an "aging-suppressor" that accelerates aging when disrupted and extends lifespan when overexpressed. The α-Klotho hormone is a circulating hormone primarily produced in the kidneys and choroid plexus of the brain and was recently discovered to delay and suppress the deleterious effects of aging on multiple organs, including the brain. Circulating levels of α-Klotho hormone gradually decline with age and are implicated in chronic stress, cognitive impairment, and neurodegenerative disease.

A small percentage of the population possesses naturally elevated α-Klotho levels as a result of the α-Klotho-VS heterozygous genetic variation. α-Klotho-VS heterozygosity is associated with extended healthspan, enhanced cognition, and less age-related cognitive decline. Elevated α-Klotho levels are also associated with greater dorsolateral prefrontal cortex volume and improved connectivity between cortical regions, which in turn correlates with better executive function in normal aging humans. As this brain region is especially susceptible to shrinkage with age and vulnerable in several psychiatric and neurological disorders, its protection may provide clinical benefit in both normal aging and disease.

In 2014, Dena Dubal, of the University of California, San Francisco, and one of our scientific collaborators, first demonstrated that genetically elevated α-Klotho levels significantly enhance cognitive performance and neural resilience independent of age in normal and human amyloid precursor protein mouse models of neurodegenerative disease related to Alzheimer's Disease. α-Klotho is hypothesized to optimize synaptic neurotransmission of NMDA receptors in the brain, effectively combatting the cognitive and synaptic deficits, despite high levels of pathogenic Ab, tau, and phosphorylated tau proteins associated with Alzheimer's Disease.

We are exploring the utility of α-Klotho hormone in a variety of preclinical animal models of cognition and neurological function, with the intention of identifying a drug candidate.

Manufacturing

Our success as a company will depend on our ability to deliver reliable, high-quality preclinical and clinical drug supply. As we mature as a company and approach commercial stage operations, securing reliable high-quality commercial drug supply will be critical. We contract with third parties for the manufacture of our drug candidates for clinical studies. Because we rely on contract manufacturers, we employ personnel with extensive technical, manufacturing, analytical, and quality experience. Our staff has strong project management discipline to oversee contract manufacturing and testing activities, and to compile manufacturing and quality information for our regulatory submissions.

Manufacturing is subject to extensive regulation that imposes various procedural and documentation requirements and that governs record keeping, manufacturing processes and controls, personnel, quality control and quality assurance, and more. Our systems and our contractors are required to be in compliance with these regulations, and compliance is assessed regularly through monitoring of performance and a formal audit program.

Our current supply chains for our lead drug candidates involve several manufacturers that specialize in specific operations of the manufacturing process, specifically, raw materials manufacturing, drug substance manufacturing, drug product manufacturing, and drug product labeling, packaging and storage. We currently operate under purchase order programs for our drug candidates with Material Service Agreements in place, and we intend to establish long-term supply agreements in the future. We believe our current manufacturers have the scale, the systems, and the experience to supply all planned clinical studies.

We do not currently require commercial manufacturing capabilities. Should our needs change, we will likely need to scale up our manufacturing processes to enable commercial launch. To ensure continuity in our supply chain, we plan to establish supply arrangements with alternative larger scale suppliers for certain portions of our supply chain, as appropriate.

Commercialization Plan

We do not currently have, nor do we expect to have in the near term, any FDA-approved drugs in our portfolio. Therefore, we have not yet built an infrastructure for sales, marketing, or commercial distribution.

Should any of our drug candidates be approved for commercialization, we intend to develop a plan to commercialize them in the U.S. and other key markets, through an internal infrastructure or external partnerships.

Competition

The biotechnology and pharmaceutical industries, including the field of research in aging, are typically rife with rapid technological developments, bold competition, and dependence on intellectual property. Like any biotechnology company, we face competition from multiple sources, including large or established pharmaceutical, biotechnology, and wellness companies, academic research institutions, government agencies, and private institutions. We believe our drug candidates will prevail amid the competitive landscape through their efficacy, safety, administration methods and convenience, cost, public and institutional demand, intellectual property portfolio, and treatment of the root cause of many age-related diseases.

We are aware of other companies seeking to develop treatments to prevent or treat aging-associated diseases through various biological pathways, including several large pharmaceutical companies that have exploratory programs as well as a number of earlier-stage companies. Most of these companies are either in early stages of discovery research in senescence or have not yet disclosed pipeline candidates or mechanisms of interest, and those companies that have disclosed pipeline candidates are targeting other pathways (e.g., resTORbio is developing candidates targeting TORC1). Hence, we believe that we currently have the most advanced program addressing cellular senescence.

Our drug candidates are likely to compete against current therapies from a wide range of companies and technologies, including therapies for our lead indications:

- Musculoskeletal diseases, including osteoarthritis: current standard of care treatments (though not disease-modifying and focused on symptom management) include non-steroidal anti-inflammatory drugs (ibruprofen, diclofenac, celecoxib), intra-articular steroids (triamcinolone), analgesic pain relief (Acetaminophen), or narcotic pain relief (tramadol).
- Ophthalmology diseases, including diabetic retinopathy: current standard of care treatments include anti-VEGF antibodies (bevacizumab, ranibizumab, aflibercept, brolucizumab); intravitreal steroid (dexamethasone); and pan-retinal photocoagulation by laser for both neovascular AMD, DR, and DME. There is no currently available treatment for geographic atrophy form of AMD. There are potentially

disease-modifying therapeutics are being developed by several pharmaceutical and biotechnology companies, including Roche/Genentech and Regeneron.

- Pulmonary disease, including idiopathic pulmonary fibrosis: therapeutics are being sold and developed by several pharmaceutical and biotechnology companies and academic institutions, including Genentech, Boehringer-Ingelheim, Cytokinetics and Mallinckrodt, and are in various stages of clinical studies.

Many of our competitors, either alone or with strategic partners, have substantially greater financial, technical, and human resources than we do. Accordingly, our competitors may be more successful in obtaining approval for treatments and achieving widespread market acceptance, rendering our treatments obsolete or non-competitive. Accelerated merger and acquisition activity in the biotechnology and biopharmaceutical industries may result in even more resources concentrated among a smaller number of our competitors. These companies also compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical study sites, patient registration for clinical studies, and acquiring technologies complementary to, or necessary for, our programs. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. Our commercial opportunity could be substantially limited in the event that our competitors develop and commercialize products that are more effective, safer, more tolerable, more convenient, or less expensive than our comparable products. In geographies that are critical to our commercial success, competitors may also obtain regulatory approvals before us, resulting in our competitors building a strong market position in advance of our products' entry. We believe the factors determining the success of our programs will be the efficacy, safety, and convenience of our drug candidates.

Intellectual Property

Our success depends in large part upon our ability to obtain and maintain proprietary protection for our products and technologies and to operate without infringing the proprietary rights of others. Our policy is to protect our proprietary position by, among other methods, filing U.S. and foreign patent applications that relate to our proprietary technologies, inventions and improvements that are important to the development and implementation of our business. We also rely on trademarks, trade secrets, know-how, continuing technological innovation and licensing opportunities to develop and maintain our proprietary position.

Patent Portfolio

Our patent portfolio consists of a combination of issued and allowed patents and pending patent applications that are owned or co-owned by us and/or licensed or optioned to us from third parties. The majority of these patents and applications cover our cellular senescence program, and others pertain to our programs that target aging mechanisms beyond cellular senescence, including the administration of α-Klotho hormone. As of March 1, 2020, we own, co-own, or have an exclusive license or exclusive option to license in certain fields of use more than 140 patents and pending applications in the United States and foreign jurisdictions. This portfolio includes 36 issued and allowed U.S. patents and applications and 18 granted and allowed foreign patents and applications, respectively.

Our cellular senescence patent portfolio includes patents and patent applications that are directed to our senolytic agents and programs, including our lead drug candidates UBX0101, UBX1325 and UBX1967, related molecules, and other compounds. We also have licensed the issued patents and patent applications covering the composition of matter and process manufacturing of UBX1967 under a license agreement with Ascentage Pharma Group Corp. Ltd., or Ascentage, and have an exclusive option to secure a license agreement from Ascentage to patents and patent applications covering UBX1325 on the same terms, as further described below. Our cellular senescence patent portfolio includes patents and patent applications directed to compositions of matter, use for treating age-related conditions, and methods of manufacture.

Our patent portfolio, including patents and applications that we have exclusively licensed, directed to our α-Klotho hormone program, includes one issued U.S. patent, one allowed U.S. patent application, and eight pending patent applications in foreign jurisdictions.

In general, patents have a term of 20 years from the earliest claimed non-provisional priority date. Several of our issued U.S. and foreign patents that relate to UBX0101 and UBX1967 are scheduled to expire between approximately 2032 and 2037, and any future patents issued from applications that claim priority from our pending U.S. provisional patent applications would be scheduled to expire in 2040, assuming such applications are timely filed. The patent term may be extendible by up to five years in certain countries by means of patent term extension depending on the regulatory pathway and the remaining term upon marketing approval. Certain other patents and patent applications directed to our cellular senescence patent portfolio, if they were to issue, may have later expiration dates. Any pending U.S. provisional application is not eligible to become an issued patent until, among other things, we file a non-provisional patent application within 12 months of filing the related provisional patent application. If we do not timely file any non-provisional patent application, we may lose our priority date with respect to our provisional patent application and any patent protection on the inventions disclosed in our provisional patent application.

Osteoarthritis Program

We co-own a patent family directed to the treatment of senescence-related diseases, including osteoarthritis, by removal of senescent cells in or around the site of the disease. The other co-owners of this patent family are the Buck Institute for Research on Aging, or the Buck Institute, the Johns Hopkins University, and Mayo Clinic, each of which has granted us an exclusive license that extends to the treatment of senescence-related diseases in therapeutic areas. This patent family includes four issued U.S. patents and two granted foreign patents directed toward the use of UBX0101 for the treatment of osteoarthritis. One of these issued U.S. patents covers a unit dose of a pharmaceutical composition as a composition of matter, and the other three cover methods of treatment. Applications are also pending in the following 14 foreign jurisdictions: Australia, Brazil, Canada, China, Europe, Hong Kong, Israel, Japan, Korea, Mexico, New Zealand, Singapore, and South Africa. Patents that issue from this family are expected to expire in 2035, excluding any patent term adjustments or extensions.

We solely own a patent family directed to a scalable method of chiral synthesis of UBX0101, which includes two issued U.S. patents, one pending U.S. patent application, one granted Canadian patent, and pending applications in Australia, China, Europe, Japan, Mexico, Korea and Singapore. Future U.S. and foreign patents issued from this family are expected to expire in 2037, excluding any patent term adjustments and patent term extensions.

We additionally solely own two pending U.S. provisional applications covering aspects of our osteoarthritis program as studied in our Phase 1 clinical study of UBX0101 in patients with painful, moderate-to-severe OA of the knee, and our Phase Ib and Phase II clinical trial designs and projected results in similar patient populations. Any future patents issued from applications that claim priority from our pending provisional U.S. patent applications would be scheduled to expire in 2040, assuming such applications are timely filed and excluding any patent term adjustments and patent term extensions.

Ophthalmology Program

We have entered into a license with Ascentage to a family of issued composition of matter patents and pending manufacturing patent applications directed to chemical entities including our lead drug candidate, UBX1967. This license grants us exclusive development and commercialization rights and non-exclusive manufacturing rights to UBX1967 for all non-oncology indications outside of Greater China (China, Hong Kong, Macau and Taiwan). Inside Greater China, we will be obligated to develop, manufacture and commercialize UBX1967 through a joint venture with Ascentage. Patents in this family have been granted in the U.S., Korea, New Zealand, South Africa, Australia, Canada, Japan and Europe, and are pending in China, India and Singapore. Patents that issue from this family are expected to expire in 2032, excluding any patent term adjustments or extensions.

The UBX1967 license agreement with Ascentage also grants us the right to continue our preclinical development efforts with UBX1325 until the time we wish to submit an IND for UBX1325, at which point we would be required to either enter into a separate license agreement with Ascentage covering UBX1325, the terms of which would mirror the UBX1967 license agreement, or substitute UBX1325 for UBX1967 under the existing license agreement. In either case, the UBX1325 license agreement would grant us with access to issued patents and patent applications covering the composition of matter and process manufacturing of UBX1325.

We co-own a patent family encompassing the use of Bcl-2/XL inhibitors generally to treat various age-related eye diseases (which also covers aspects of our osteoarthritis and ophthalmology programs) with the Buck Institute and the Mayo Clinic. We have exclusive licenses from each of the Buck Institute and the Mayo Clinic to to this patent family in the field of senescence. To date, three U.S. patents have issued in this patent family which are directed to treating eye diseases, including age-related macular degeneration, all of which are expected to expire in 2035, excluding any patent term extensions. Other patent applications are pending in the U.S., Australia, Canada, China, Europe, and Japan. Patents that issue from this family are expected to expire in 2035, excluding any patent term adjustments and patent term extensions.

We co-own with the Buck Institute a patent family encompassing the use of Bcl-2/XL inhibitors, including UBX1967 and UBX1325, for the treatment of various age-related eye diseases, including diabetic retinopathy and age-related macular degeneration. Patent applications in this family are pending in the U.S., Australia, Canada, China, Europe, Japan and Hong Kong. Future patents issued from this family are expected to expire in 2036, excluding any patent term adjustments and patent term extensions. We have an exclusive license from the Buck Institute to this patent family in the field of senescence.

We solely own a patent family covering the use of UBX1967 and UBX1325 to inhibit vaso-obliteration in the eye, and future patents issued from this family would be expected to expire in 2038 excluding any patent term adjustments and patent term extensions. We also solely own a patent family that specifically claims the composition of matter of UBX1325 and methods of use of UBX1325. Future patents issued from this family are expected to expire in 2038, excluding any patent term adjustments and patent term extensions.

Pulmonary Program

We are currently testing a number of drug candidates for the treatment of pulmonary disease. One of these compounds is covered as composition of matter by the issued patents and pending applications that are included in the patent family we have licensed from Ascentage. We solely own four patent families, two of which consist of provisional U.S. patent applications, that claim aspects of other candidate compounds as compositions of matter for the treatment of various pulmonary diseases, including idiopathic pulmonary fibrosis, or IPF, and chronic obstructive pulmonary disease, or COPD. Future patents issued from these patent families, including any future patents issued from applications that claim priority from our pending provisional U.S. patent applications, would be expected to expire in 2038, 2039 and 2040, assuming such applications are timely filed and excluding any patent term adjustments and patent term extensions.

We also co-own two families of pending patent applications directed to the use of Bcl inhibitors for the treatment of pulmonary disease, including IPF and COPD (which also cover aspects of our osteoarthritis and/or ophthalmology programs). One of these patent families is co-owned by the Buck Institute and us. The patents within the other family that are relevant for pulmonary indications are co-owned by the Buck Institute, the Mayo Clinic and us. We have exclusive licenses from each of the Buck Institute and the Mayo Clinic to these patent families in the field of senescence. Patent applications in both these families are pending in the U.S., Australia, Canada, China, Europe, and Japan. Future U.S. and foreign patents issued from these families are expected to expire in 2035 and 2036, excluding any patent term adjustments and patent term extensions.

Other Anti-Aging Programs

We have entered into an exclusive license with The Regents of the University of California for a patent family directed to methods of treatment and the use of α-Klotho hormone for the development of human therapeutics. Our patent portfolio includes one issued U.S. patent, one allowed U.S. patent application, one pending patent application in each of the U.S. and in Australia, Canada, Europe, Hong Kong, India and Japan, and two pending patent applications in China. Patents that issue from this family are expected to expire in 2036, excluding any patent term adjustments and patent term extensions.

Other Intellectual Property

Our continuing research and development, technical know-how, and contractual arrangements supplement our intellectual property protection to maintain our competitive position. Our policy is to require inventors who are identified on any Company-owned patent applications to assign rights to us. We also have confidentiality agreements with our employees, consultants, and other advisors to protect our proprietary information. Our policy is to require third parties that receive material UNITY confidential information to enter into confidentiality agreements with us.

We also protect our brand through procurement of trademark rights. As of March 2020, the mark UNITY BIOTECHNOLOGY® and the UNITY BIOTECHNOLOGY® design logo are registered in both the United States and the European Union as well as other foreign jurisdictions. The mark UNITY® is also registered in the U.S. and in the European Union. In order to supplement protection of our brand, we have also registered several internet domain names.

Government Regulation

Government authorities in the United States (including federal, state and local authorities) and in other countries, extensively regulate, among other things, the manufacturing, research and clinical development, marketing, labeling and packaging, storage, distribution, post-approval monitoring and reporting, advertising and promotion, pricing, and export and import of pharmaceutical products, such as those we are developing. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. Government Regulation

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implementing regulations, and biologics under the FDCA and the Public Health Service Act, or PHSA, and its implementing regulations. FDA approval is required before any new unapproved drug or dosage form, including a new use of a previously approved drug, can be marketed in the United States. Drugs and biologics are also subject to other federal, state and local statutes and regulations. If we fail to comply with applicable FDA or other requirements at any time during the drug development process, clinical testing, the approval process or after approval, we may become subject to administrative or judicial sanctions. These sanctions could include the FDA's refusal to approve pending applications, license suspension or revocation, withdrawal of an approval, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties or criminal prosecution.

The process required by the FDA before drug candidates may be marketed in the United States generally involves the following:

- completion of extensive preclinical laboratory tests and preclinical animal studies, all performed in accordance with GLP regulations;
- submission to the FDA of an IND, which must become effective before human clinical studies may begin;
- approval by an independent institutional review board, or IRB, or ethics committee representing each clinical site before each clinical study may be initiated;
- performance of adequate and well-controlled human clinical studies to establish the safety and efficacy, or in the case of a biologic, the safety, purity and potency, of the drug candidate for each proposed indication;
- preparation of and submission to the FDA of a new drug application, or NDA, or biologics license application, or BLA, after completion of all pivotal clinical studies;
- review of the product application by an FDA advisory committee, where appropriate and if applicable;
- a determination by the FDA within 60 days of its receipt of an NDA or BLA to file the application for review;

- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities where the drug candidate is produced to assess compliance with current Good Manufacturing Practices, or cGMP; and
- FDA review and approval of an NDA or BLA prior to any commercial marketing or sale of the drug or biologic in the United States.

An IND is a request for authorization from the FDA to administer an investigational new drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for human studies. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology and pharmacodynamic characteristics of the product; chemistry, manufacturing and controls information; and any available human data or literature to support the use of the investigational new drug. An IND must become effective before human clinical studies may begin. An IND will automatically become effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to the proposed clinical studies. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before clinical studies can begin. Accordingly, submission of an IND may or may not result in the FDA allowing clinical studies to commence.

Clinical Studies

Clinical studies involve the administration of the investigational new drug to human subjects under the supervision of qualified investigators in accordance with Good Clinical Practice regulations, or GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical studies are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the efficacy criteria to be evaluated. A protocol for each clinical study and any subsequent protocol amendments must be submitted to the FDA as part of the IND. Additionally, approval must also be obtained from each clinical study site's IRB before the studies may be initiated, and the IRB must monitor the study until completed. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

The clinical investigation of a drug or biologic is generally divided into three or four phases. Although the phases are usually conducted sequentially, they may overlap or be combined.

- *Phase 1.*The drug or biologic is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are designed to evaluate the safety, dosage tolerance, metabolism and pharmacologic actions of the investigational new drug in humans, the side effects associated with increasing doses, and if possible, to gain early evidence on effectiveness.
- *Phase 2.*The drug or biologic is administered to a limited patient population to evaluate dosage tolerance and optimal dosage, identify possible adverse side effects and safety risks and preliminarily evaluate efficacy.
- *Phase 3.*The drug or biologic is administered to an expanded patient population, generally at geographically dispersed clinical study sites to generate enough data to statistically evaluate dosage, clinical effectiveness and safety, to establish the overall benefit-risk relationship of the investigational product and to provide an adequate basis for product approval.
- *Phase 4.*In some cases, the FDA may condition approval of an NDA or BLA for a drug candidate on the sponsor's agreement to conduct additional clinical studies after approval. In other cases, a sponsor may voluntarily conduct additional clinical studies after approval to gain more information about the drug. Such post-approval studies are typically referred to as Phase 4 clinical studies.

A pivotal study is a clinical study that adequately meets regulatory agency requirements for the evaluation of a drug candidate's efficacy and safety such that it can be used to justify the approval of the product. Generally, pivotal studies are Phase 3 studies, but the FDA may accept results from Phase 2 studies if the study design provides a well-controlled and reliable assessment of clinical benefit, particularly in situations where there is an unmet medical need and the results are sufficiently robust.

The FDA, the IRB or the clinical study sponsor may suspend or terminate a clinical study at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Additionally, some clinical studies are overseen by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study. We may also suspend or terminate a clinical study based on evolving business objectives and/or competitive climate.

Submission of an NDA or BLA to the FDA

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, detailed investigational new drug product information is submitted to the FDA in the form of an NDA or BLA requesting approval to market the product for one or more indications. Under federal law, the submission of most NDAs and BLAs is subject to a substantial application user fee. Applications for orphan drug products are exempted from the NDA and BLA application user fees.

An NDA or BLA must include all relevant data available from pertinent preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls and proposed labeling, among other things. Data can come from company-sponsored clinical studies intended to test the safety and effectiveness of a use of a product, 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 effectiveness of the investigational product to the satisfaction of the FDA.

Once an NDA or BLA has been submitted, the FDA's goal is to review the application within ten months after it accepts the application for filing, or, if the application receives priority review, six months after the FDA accepts the application for filing. The review process is often significantly extended by FDA requests for additional information or clarification.

Before approving an NDA or BLA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application 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. Additionally, before approving an NDA or BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP.

The FDA is required to refer an application for a novel drug or biologic to an advisory committee or explain why such referral was not made. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions and typically follows such recommendations.

The FDA's Decision on an NDA or BLA

After the FDA evaluates the NDA or BLA and conducts inspections of manufacturing facilities, it may 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 is not ready for approval. A Complete Response Letter may require additional clinical data and/or an additional pivotal Phase 3 clinical study(ies), and/or other significant, expensive and time-consuming requirements related to clinical studies, preclinical studies or manufacturing. Even if such additional information is submitted, the FDA may ultimately decide that the NDA or BLA does not satisfy the criteria for approval. The FDA could also approve the NDA or BLA with a Risk Evaluation and Mitigation Strategy, or REMS, to mitigate risks, which 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. The FDA also may condition approval on, among other things, changes to proposed

labeling, development of adequate controls and specifications or a commitment to conduct one or more post-market studies or clinical studies. Such post-market testing may include Phase 4 clinical studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our products under development.

Expedited Review and Accelerated Approval Programs

The FDA has various programs, including fast track designation, breakthrough therapy designation, accelerated approval, and priority review, that are intended to expedite the development and approval of new drugs and biologics that address unmet medical needs in the treatment of serious or life-threatening diseases and conditions. To be eligible for a fast track designation, the FDA must determine, based on the request of a sponsor, that a product is intended to treat a serious or life-threatening disease or condition and demonstrates the potential to address an unmet medical need. The FDA may review sections of the NDA for a fast-track product on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA.

The FDA may give a priority review designation to drugs or biologics that are designed to treat a serious condition and, if approved, would provide a significant improvement in safety or effectiveness compared to available therapies. A priority review means that the goal for the FDA to review an application is six months, rather than the standard review of ten months. These six- and 10-month review periods are measured from the "filing" date rather than the receipt date for NDAs for new molecular entities, which typically adds approximately two months to the timeline for review and decision from the date of submission. Products that are eligible for fast-track designation may also be eligible for priority review.

In addition, products studied for their safety and effectiveness in treating serious or life-threatening illnesses and that provide meaningful therapeutic benefit over existing treatments may be eligible for accelerated approval and may be approved on the basis of adequate and well-controlled clinical studies establishing that the product has 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, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require a sponsor of a drug receiving accelerated approval to perform post-marketing studies to verify and describe the predicted effect on irreversible morbidity or mortality or other clinical endpoint, and the drug or biologic may be subject to expedited withdrawal procedures if the sponsor fails to conduct the required post-marketing studies, or such post-marketing studies fail to confirm the predicted clinical benefit.

Moreover, under the provisions of the Food and Drug Administration Safety and Innovation Act, or FDASIA, passed in July 2012, a sponsor can request designation of a product candidate as a "breakthrough therapy." 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 product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. This designation includes all of the features of fast track designation, as well as more intensive FDA interaction and guidance. The breakthrough therapy designation is a distinct status from both accelerated approval and priority review, but these can also be granted to the same product candidate if the relevant criteria are met. The FDA must take certain actions, such as holding timely meetings and providing advice, intended to expedite the development and review of an application for approval of a breakthrough therapy.

Fast track designation, priority review, and breakthrough therapy designation do not change the standards for approval but may expedite the development or approval process. Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Post-Approval Requirements

Drugs and biologics marketed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval. There also are continuing, annual user fee requirements.

Manufacturers are subject to periodic unannounced inspections by the FDA and state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

Discovery of previously unknown problems with a product or the failure to comply with applicable requirements may result in restrictions on a product, manufacturer or holder of an approved NDA or BLA, including withdrawal or recall of the product from the market or other voluntary, FDA-initiated or judicial action that could delay or prohibit further marketing. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory approval of our products under development.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical studies to assess new safety risks; or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product;
- complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical studies;
- refusal of the FDA to approve pending NDAs or BLAs or supplements to approved NDAs or BLAs, or suspension or revocation of product licenses or approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

Orphan Designation and Exclusivity

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, defined as a disease or condition with a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 individuals in the United States and when there is no reasonable expectation that the cost of developing and making available the drug or biologic in the United States will be recovered from sales in the United States for that drug or biologic. Orphan drug designation

must be requested before submitting a BLA or NDA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA.

If a product that has orphan drug designation subsequently receives the first FDA approval for a particular active ingredient for the disease for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications, including a full NDA or BLA, to market the same drug or biologic for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or if FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. Orphan drug exclusivity does not prevent the FDA from approving a different drug or biologic for the same disease or condition, or the same drug or biologic for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the BLA or NDA application user fee.

A designated orphan drug many not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. In addition, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or, as noted above, if the second applicant demonstrates that its product is clinically superior to the approved product with orphan exclusivity or the manufacturer of the approved product is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition.

Biosimilars and Exclusivity

The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or the Affordable Care Act, signed into law in 2010, includes a subtitle called the Biologics Price Competition and Innovation Act of 2009, or BPCIA, which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. To date, only a handful of biosimilars have been licensed under the BPCIA, although numerous biosimilars have been approved in Europe. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars.

Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic 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 biologic. However, complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being worked out by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant’s own preclinical data and data from adequate and well-controlled clinical studies to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed “interchangeable” by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

A biological product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs

from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued "Written Request" for such a study.

The BPCIA is complex and continues to be interpreted and implemented by the FDA. In addition, recent government proposals have sought to reduce the 12-year reference product exclusivity period. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. As a result, the ultimate impact, implementation, and impact of the BPCIA is subject to significant uncertainty.

Hatch-Waxman Amendments and Exclusivity

Section 505 of the FDCA describes three types of marketing applications that may be submitted to the FDA to request marketing authorization for a new drug. A Section 505(b)(1) NDA is an application that contains full reports of investigations of safety and efficacy. A 505(b)(2) NDA is an application that contains full reports of investigations of safety and efficacy but where at least some of the information required for approval comes from investigations that were not conducted by or for the applicant and for which the applicant has not obtained a right of reference or use from the person by or for whom the investigations were conducted. This regulatory pathway enables the applicant to rely, in part, on the FDA's prior findings of safety and efficacy for an existing product, or published literature, in support of its application. Section 505(j) establishes an abbreviated approval process for a generic version of approved drug products through the submission of an Abbreviated New Drug Application, or ANDA. An ANDA provides for marketing of a generic drug product that has the same active ingredients, dosage form, strength, route of administration, labeling, performance characteristics and intended use, among other things, to a previously approved product. ANDAs are termed "abbreviated" because they are generally not required to include preclinical (animal) and clinical (human) data to establish safety and efficacy. Instead, generic applicants must scientifically demonstrate that their product is bioequivalent to, or performs in the same manner as, the innovator drug through in vitro, *in vivo* or other testing. The generic version must deliver the same amount of active ingredients into a subject's bloodstream in the same amount of time as the innovator drug and can often be substituted by pharmacists under prescriptions written for the reference listed drug. In seeking approval for a drug through an NDA, applicants are required to list with the FDA each patent with claims that cover the applicant's drug or a method of using the drug. Upon approval of a drug, each of the patents listed in the application for the drug is then published in the FDA's Approved Drug Products with Therapeutic Equivalence Evaluations, commonly known as the Orange Book. Drugs listed in the Orange Book can, in turn, be cited by potential competitors in support of approval of an ANDA or 505(b)(2) NDA.

Upon submission of an ANDA or a 505(b)(2) NDA, an applicant must certify to the FDA that (1) no patent information on the drug product that is the subject of the application has been submitted to the FDA; (2) such patent has expired; (3) the date on which such patent expires; or (4) such patent is invalid or will not be infringed upon by the manufacture, use or sale of the drug product for which the application is submitted. Generally, the ANDA or 505(b)(2) NDA cannot be approved until all listed patents have expired, except where the ANDA or 505(b)(2) NDA applicant challenges a listed patent through the last type of certification, also known as a paragraph IV certification. If the applicant does not challenge the listed patents, or indicates that it is not seeking approval of a patented method of use, the ANDA or 505(b)(2) NDA application will not be approved until all of the listed patents claiming the referenced product have expired.

If the ANDA or 505(b)(2) NDA applicant has provided a Paragraph IV certification to the FDA, the applicant must send notice of the Paragraph IV certification to the NDA and patent holders once the application has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the paragraph IV certification. If the paragraph IV certification is challenged by an NDA holder or the patent owner(s) asserts a patent challenge to the paragraph IV certification, the FDA may not approve that application until the earlier of 30 months from the receipt of the notice of the paragraph IV certification, the expiration of the patent, when the infringement case concerning each such patent was favorably decided in the applicant's favor or settled, or such shorter or longer period as may be ordered by a court. This prohibition is generally referred to as the 30-month stay. In instances where an ANDA or 505(b)(2) NDA applicant files a paragraph IV certification, the NDA holder or patent owner(s) regularly take action to trigger the 30-month stay, recognizing that the related patent litigation may take many months or years to resolve.

The FDA also cannot approve an ANDA or 505(b)(2) application until all applicable non-patent exclusivities listed in the Orange Book for the branded reference drug have expired. For example, a pharmaceutical manufacturer may obtain five years of non-patent exclusivity upon NDA approval of a new chemical entity, or NCE, which is a drug containing an active moiety that has not been approved by FDA in any other NDA. An "active moiety" is defined as the molecule responsible for the drug substance's physiological or pharmacologic action. During that five-year exclusivity period, the FDA cannot accept for filing (and therefore cannot approve) any ANDA seeking approval of a generic version of that drug or any 505(b)(2) NDA that relies on the FDA's approval of the drug, provided that that the FDA may accept an ANDA four years into the NCE exclusivity period if the ANDA applicant also files a Paragraph IV certification.

A drug, including one approved under Section 505(b)(2), may obtain a three-year period of exclusivity for a particular condition of approval, or change to a marketed product, such as a new formulation for a previously approved product, if one or more new clinical studies (other than bioavailability or bioequivalence studies) was essential to the approval of the application and was conducted/sponsored by the applicant. Should this occur, the FDA would be precluded from approving any ANDA or 505(b)(2) application for the protected modification until after that three-year exclusivity period has run. However, unlike NCE exclusivity, the FDA can accept an application and begin the review process during the exclusivity period.

Other Healthcare Laws and Compliance Requirements

Pharmaceutical companies are subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which they conduct their business. Such laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, privacy and security and physician sunshine laws and regulations. If their operations are found to be in violation of any of such laws or any other governmental regulations that apply, they may be subject to penalties, including, without limitation, civil and criminal penalties, damages, fines, the curtailment or restructuring of operations, exclusion from participation in federal and state healthcare programs and individual imprisonment.

Coverage and Reimbursement

Sales of any product depend, in part, on the extent to which such product will be covered by third-party payors, such as federal, state and foreign government healthcare programs, commercial insurance and managed healthcare organizations and the level of reimbursement for such product by third-party payors. Decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. These third-party payors are increasingly reducing reimbursements for medical products, drugs and services. For products administered under the supervision of a physician, obtaining coverage and adequate reimbursement may be particularly difficult because of the higher prices often associated with such drugs. In addition, the U.S. government, state legislatures and foreign governments have continued implementing cost-containment programs, including price controls, restrictions on coverage and reimbursement and requirements for substitution of generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product. Decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product and also have a material adverse effect on sales.

Healthcare Reform

In March 2010, former President Obama signed the Affordable Care Act, which substantially changed the way healthcare is financed by both governmental and private insurers in the United States, and significantly affected the pharmaceutical industry. The Affordable Care Act contains a number of provisions, including those governing enrollment in federal healthcare programs, reimbursement adjustments and fraud and abuse changes. Additionally, the Affordable Care Act increases the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1%; requires collection of rebates for drugs paid by Medicaid managed care organizations; requires manufacturers to participate in a coverage gap discount program, under which they must agree to offer 70 percent point-of-sale discounts 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; and imposes a non-deductible annual fee on pharmaceutical manufacturers or importers who sell "branded prescription drugs" to specified federal government programs.

Since its enactment, there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act, and we expect there will be additional challenges and other efforts to repeal or replace the Affordable Care Act in the future. Other legislative changes have been proposed and adopted since the Affordable Care Act was enacted, including aggregate reductions of Medicare payments to providers of 2% per fiscal year and reduced payments to several types of Medicare providers. Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed bills designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drug products. Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

Licenses and Collaborations

Description of Ascentage Agreements

In February 2016, we entered into several related agreements with Ascentage Pharma Group Corp. Limited, or, Ascentage, based in Hong Kong, China. These agreements include (i) a compound library and option agreement, which includes a template form of license agreement, (ii) a license agreement covering an initial compound, APG1252, and (iii) a research services agreement. In January 2019, we entered into another license agreement granting us development and commercialization rights to UBX1967 and the right to continue preclinical development efforts with another Ascentage-controlled Bcl-2 inhibitor compound.

Library Agreement and License Template

The compound library and option agreement, or library agreement, gives us access to Ascentage's existing collection of Bcl-2 inhibitor compounds, as well as any additional Bcl-2 inhibitor compounds developed during the term of the library agreement, in order to screen such compounds for senolytic activity. The library agreement permits us to nominate up to 15 such compounds at any given time for further evaluation and subsequently to select up to five of such selected compounds for preclinical development and an additional five as back-up compounds. Prior to commencing IND-enabling toxicology studies on an Ascentage compound of interest, we must formally designate the compound as a development candidate under the library agreement and enter into a separate license agreement with Ascentage covering that compound on the terms set forth in the template form of license agreement. The library agreement includes exclusivity provisions that (i) prohibit us from developing Ascentage Bcl-2 compounds for oncology indications, (ii) prohibit Ascentage from researching or developing certain Bcl-2 compounds for non-oncology indications under any circumstances, and (iii) prohibit Ascentage from researching or developing certain other Bcl-2 compounds for a specified set of non-oncology indications under certain circumstances. The term of the library agreement is determined by a formula that is linked to the term of the research services agreement, with a maximum term of six years. The library agreement may be terminated by either party due to the other party's uncured material breach of the library agreement.

Under the terms of the template form of license agreement, Ascentage will grant us the following rights with respect to a selected Ascentage compound for all non-oncology indications: (i) exclusive worldwide development rights, and (ii) exclusive commercialization rights outside of Greater China (China, Hong Kong, Macau and Taiwan). Inside Greater China, we will be obligated to commercialize the licensed Ascentage compound through a joint venture with Ascentage. Ascentage will also have the right to manufacture at least 50% of our supply requirements of the licensed compound, provided they achieve and maintain certain manufacturing quality standards. We will be obligated to make certain milestone payments in the form of shares of our common stock, subject to the equity cap described below, and other milestone payments in in the form of cash, not to exceed $38

million per licensed product, based in each case, upon the achievement of certain clinical and commercial milestones. We will also be required to make low-single digit royalty payments on net sales of the licensed product under the agreement. Our royalty payment obligations will expire on a country-by-country basis and licensed product-by-licensed product basis upon the later to occur of (a) the expiration of the last valid claim of a licensed patent covering such licensed product in such country, (b) the expiration of regulatory exclusivity for such licensed product in such country, and (c) the tenth anniversary of the first commercial sale of such licensed product in any country. We have the right to credit certain royalty payments that we pay to third parties with respect to certain licensed products against our royalty obligation to Ascentage. Any license agreement may be terminated by either party due to the other party's uncured material breach of the agreement.

Under the library agreement, we issued 133,333 shares of our common stock as an upfront license fee. Of such shares, 80% were issued to Ascentage and 20% were issued to the University of Michigan in satisfaction of Ascentage's obligation to pay a related sublicense fee to the University of Michigan. In addition to the shares issued pursuant to the APG1252 license agreement described below, we will also be obligated to issue an additional 133,333 shares of our common stock as an upfront license fee to Ascentage and the University of Michigan for each of the next two license agreements. The aggregate number of shares of our common stock we could be required to issue to Ascentage and the University of Michigan pursuant to the library agreement, the APG1252 license agreement, and any additional license agreements we enter into pursuant to the library agreement is capped at 1,333,338 shares.

APG1252 License Agreement

In conjunction with the library agreement, we entered into our first license agreement with Ascentage, which grants us the right to develop and commercialize an Ascentage compound known as APG1252 on the template license terms described above, including up to $38.0 million of potential cash milestone payments and low-single digit royalties. Under the APG1252 license agreement, Ascentage retains the right to manufacture APG1252 compounds for use in our licensed products. In connection with the APG1252 license agreement, we issued 533,335 shares of our common stock as an upfront license fee to Ascentage and the University of Michigan, in the proportion described above. The APG1252 license agreement may be terminated by either party due to the other party's uncured material breach of the APG1252 license agreement, and we may terminate for convenience on a licensed product-by-licensed product basis.

Research Agreement

In conjunction with the library agreement we also entered into a research services agreement with Ascentage under which we provide $500,000 per year in funding to Ascentage for the further development of Bcl-2 inhibitor compounds, which we retain the right to access under the library agreement. The research agreement has a term of up to four years from the effective date of February 2, 2016, provided that the research agreement may be terminated by us for convenience after the first year, by either party due to the other party's uncured material breach, and by Ascentage if we fail to make the $500,000 payment in any given year. On February 2, 2020, this agreement expired by its terms and was not renewed.

UBX1967 License Agreement

In January 2019, we entered into our second license agreement with Ascentage granting rights to UBX1967 (which Ascentage calls APG1197) on the template license terms described above, including up to $38.0 million of potential cash milestone payments and low-single digit royalties. Under the terms of this license agreement, Ascentage has granted us exclusive development and commercialization rights and non-exclusive manufacturing rights to UBX1967 for all non-oncology indications outside of Greater China. Inside Greater China, we will be obligated to develop, manufacture and commercialize UBX1967 through a joint venture with Ascentage. The UBX1967 license agreement also grants us the right to continue our preclinical development efforts with another Ascentage-controlled Bcl-2 inhibitor compound. In the event we wish to pursue clinical development of the additional compound as well as UBX1967, we will be required to enter into a separate license agreement with Ascentage on the template license terms described above. In connection with the UBX1967 license agreement, we issued 106,667 shares of common stock to Ascentage and 26,667 shares of common stock to the University of Michigan as an upfront license fee in the first quarter of 2019. The UBX1967 License Agreement may be terminated

by either party due to an uncured material breach of the agreement but the other party, and we may terminate for convenience on a licensed product-by-licensed product basis. In November 2019, we entered into an amendment to the UBX1967 license agreement that removed certain field and territory limitations from a provision granting us exclusivity and amended the schedule of licensed patents to include certain additional patents relating to UBX1967. In January 2020, we entered into a second amendment to the UBX1967 license agreement which further amended and restated the schedule of licensed patents.

Additional License Agreements

We are party to three additional license agreements that support our senescence-related patent portfolio. These agreements are with The John Hopkins University, or JHU, an entity affiliated with the Mayo Clinic, or Mayo, and the Buck Institute for Research on Aging, or Buck, and provide us with a worldwide, exclusive, sublicensable license under those counter-parties' rights to a patent family that is co-owned by JHU, Buck, Mayo and us to develop and commercialize licensed products, including for the treatment of senescence-related diseases in therapeutic areas including osteoarthritis, ophthalmology, and pulmonary disease.

Under our November 2016 license with JHU, which relates to patents that are relevant only to osteoarthritis indications, we may be obligated to make development and sales milestone payments to JHU in the form of equity (22,033 shares of our common stock) and cash (of up to $2.6 million in the aggregate), to pay JHU a low-single digit percentage of certain sublicensing revenue, and to pay JHU a running royalty payment of less than 1% on net sales, in all cases, with respect to licensed products for the treatment of osteoarthritis, which we refer to as Royalty Products. Our obligation to pay running royalties to JHU under the agreement is subject to a non-material minimum annual royalty, and may continue on a country-by-country basis until such time as neither the manufacture, sale, or use of such Royalty Product would infringe a valid claim of a licensed patent in the applicable country. Our agreement with JHU continues on a country-by-country basis until the expiration of the last to expire licensed patent in such country (or until twenty years after the effective date if no licensed patent issues in such country). We may terminate the agreement for convenience (as a whole, with respect to a licensed product, or with respect to a particular licensed patent). Either party may terminate the agreement for the other party's uncured material breach or bankruptcy or insolvency-related events.

Under our June 2013 license with Mayo, we may be obligated to make development and sales milestone payments to Mayo of up to $10.8 million in the aggregate, to pay Mayo a percentage of certain sublicensing revenue that is between the high-single digits and the low-teens, and to pay Mayo running royalty payments ranging from less than 1% to low-single digit percentages on net sales of licensed products. Our obligation to pay running royalties to Mayo under the agreement is subject to a non-material minimum annual royalty and could potentially extend until January 1, 2037. We also issued 677,966 shares of our common stock to Mayo under this agreement. Our agreement with Mayo continues until the later of (i) the expiration of the last valid claim within the licensed patents and (ii) 13 years after first commercial sale of the first licensed product. We may terminate the agreement for convenience, and either party may terminate the agreement for the other party's uncured material breach.

Under our January 2017 license with Buck, which includes similar rights to a second patent family that is co-owned only by Buck and us, we may be obligated to make development and sales milestone payments to Buck of up to $5.4 million in the aggregate, to pay Buck a mid-single digit percentage of certain sublicensing revenue, and to pay Buck running royalty payments ranging from less than 1% to low-single digit percentages on net sales of licensed products. Our obligation to pay running royalties to Buck under the agreement is subject to a non-material minimum annual royalty and could potentially extend until January 1, 2037. We also issued 132,203 shares of our common stock to Buck under this agreement. The term of our license agreement with Buck continues until the expiration of all our payment obligations to Buck thereunder. We may terminate the agreement for convenience, and either party may terminate the agreement for the other party's uncured material breach.

Employees

As of March 1, 2020, we had 98 employees, all of whom were full-time. Approximately 44% of our employees hold advanced degrees. The majority of our employees work in our corporate headquarters. None of our employees is represented by a labor union or a collective bargaining agreement.

Facilities

Our corporate headquarters are located in South San Francisco, California, where we currently lease approximately 62,000 square feet of office and laboratory space pursuant to a lease dated February 28, 2019. Substantially all our employees work at our corporate headquarters.

Legal Proceedings

We are not currently involved in any litigation or legal proceedings that, in management's opinion, are likely to have any material adverse effect on our company. While we know of no imminent legal action in which we are likely to be involved, we may in the future become engaged in litigation or other legal proceedings. Regardless of the outcome, litigation can have an adverse impact due to defense fees, settlement costs, demands on management attention, and other concerns.

Financial Information About Segments

We view our operations and manage our business as one reportable segment. See Note 1 in the Notes to Financial Statements included in this Annual Report on Form 10 K. Additional information required by this item is incorporated herein by reference to Part II, Item 6, "Selected Financial Data."

About Unity

We were incorporated in the State of Delaware on March 30, 2009. Our registered trademarks include UNITY BIOTECHNOLOGY®. Other service marks, trademarks and trade names referred to in this document are the property of their respective owners.

Available Information

We are subject to the information requirements of the Securities Exchange Act of 1934, as amended, and we therefore file periodic reports, proxy statements and other information with the SEC relating to our business, financial statements and other matters. The SEC maintains an Internet site, *www.sec.gov*, that contains reports, proxy statements and other information regarding issuers such as Unity.

For more information about Unity, including free access to our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, visit our website, *www.unitybiotechnology.com*. The information found on or accessible through our website is not incorporated into, and does not form a part of, this Form 10-K.

Item 1A. Risk Factors

This Annual Report on Form 10-K contains forward-looking information based on our current expectations. Because our business is subject to many risks and our actual results may differ materially from any forward-looking statements made by or on behalf of us, this section includes a discussion of important factors that could affect our business, operating results, financial condition and the trading price of our common stock. This discussion should be read in conjunction with the other information in this Annual Report on Form 10-K, including our condensed financial statements and the notes accompanying those financial statements and "Management's Discussion and Analysis of Financial Condition and Results of Operations." The occurrence of any of the events or developments described below could have a material adverse effect on our business, results of operations, financial condition, prospects and stock price. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business.

Risks Related to Our Limited Operating History, Financial Condition, and Capital Requirements

We are a clinical-stage biopharmaceutical company with a limited operating history and no products approved for commercial sale. We have incurred significant losses since our inception, and we anticipate that we will continue to incur losses for the foreseeable future, which, together with our limited operating history, make it difficult to assess our future viability.

We are a clinical-stage biopharmaceutical company with a limited operating history. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. We have not yet sought approval for commercial sale of any products and therefore have no products approved for commercial sale and have not generated any revenue from contracts with customers and have incurred losses in each year since our inception in March 2009. We have only a limited operating history upon which you can evaluate our business and prospects. In addition, we have limited experience and have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, particularly in the biopharmaceutical industry. We completed a Phase 1 clinical study of UBX0101, a senolytic small molecule inhibitor of the MDM2/p53 protein-protein interaction, in patients with osteoarthritis, or OA, of the knee and announced initial results in the second quarter of 2019. We initiated a Phase 2 clinical study in OA of the knee in the fourth quarter of 2019 and we expect top-line results for 12- and 24-week endpoints in the second half of 2020. We also initiated a Phase 1b study to evaluate the safety, tolerability and initial effectiveness of both a higher dose and repeat doses of UBX0101 in the first quarter of 2020. We expect top-line results for 12- and 24-week endpoints from the Phase 1b study in the second half of 2020 and the first half of 2021, respectively.

We have had significant operating losses since our inception. Our net loss for the years ended December 31, 2019 and 2018, was approximately $82.2 million and $76.4 million, respectively. As of December 31, 2019, we had an accumulated deficit of $245.5 million. Substantially all of our losses have resulted from expenses incurred in connection with our research and development programs and from general and administrative costs associated with our operations. We expect to continue to incur losses for the foreseeable future, and we anticipate these losses will increase as we continue to develop our drug candidates, conduct clinical studies and pursue research and development activities. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods. Our prior losses, combined with expected future losses, have had and will continue to have an adverse effect on our stockholders' equity and working capital.

We will require substantial additional financing to achieve our goals, and a failure to obtain this capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product development, other operations or commercialization efforts.

Since our inception, we have invested a significant portion of our efforts and financial resources in research and development activities. Preclinical studies and clinical studies for our drug candidates and additional research and development activities to discover and develop new drug candidates will require substantial funds to complete. As of December 31, 2019, we had capital resources consisting of cash, cash equivalents, and marketable securities of $125.0 million. We believe that we will continue to expend substantial resources for the foreseeable future in connection with the preclinical and clinical development of our lead drug candidates, UBX0101, UBX1325 and UBX1967, and the discovery and/or development of any other drug candidates we may choose to pursue. These expenditures will include costs associated with conducting preclinical studies and clinical studies, obtaining regulatory approvals, and manufacturing and supply, as well as marketing and selling any products approved for sale. In addition, other unanticipated costs may arise. Because the outcome of any preclinical study or clinical study is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our lead drug candidates or any future drug candidates.

Based on our current operating plans, we expect our existing capital resources will fund our planned operating expenses into the second half of 2021. However, our operating plans may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations. Such financing may result in dilution to stockholders, the imposition of burdensome debt covenants and repayment obligations, or other restrictions that may affect our business. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans.

Our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of researching and developing UBX0101, UBX1325, UBX1967, or any other drug candidates, and conducting preclinical studies and clinical studies, including our ongoing Phase 2 clinical study of UBX0101, which we initiated in the fourth quarter of 2019, the Phase 1b clinical study of UBX0101, which we initiated in the first quarter of 2020, and our planned initial clinical studies in our ophthalmology program;
- the timing of, and the costs involved in, obtaining regulatory approvals for our lead drug candidates or any future drug candidates;
- the number and characteristics of any additional drug candidates we develop or acquire;
- the timing and amount of any milestone payments we are required to make pursuant to our license agreements;
- the cost of manufacturing our lead drug candidates or any future drug candidates and any products we successfully commercialize;
- the cost of building a sales force in anticipation of product commercialization;
- the cost of commercialization activities if our lead drug candidates or any future drug candidates are approved for sale, including marketing, sales and distribution costs;
- our ability to maintain existing, and establish new, strategic collaborations, licensing or other arrangements and the financial terms of any such agreements, including the timing and amount of any future milestone, royalty or other payments due under any such agreement;
- any product liability or other lawsuits related to our products;
- the expenses needed to attract, hire and retain skilled personnel;
- the costs associated with being a public company;
- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing our intellectual property portfolio; and
- the timing, receipt and amount of sales of any future approved products, if any.

Additional funds may not be available when we need them, on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to:

- delay, limit, reduce or terminate preclinical studies, clinical studies or other development activities for our lead drug candidates or any future drug candidate;
- delay, limit, reduce or terminate our research and development activities; or
- delay, limit, reduce or terminate our efforts to establish manufacturing and sales and marketing capabilities or other activities that may be necessary to commercialize our lead drug candidates or any future drug candidate, or reduce our flexibility in developing or maintaining our sales and marketing strategy.

We also could choose or be required to seek funds through arrangements with collaborators or others that may require us to relinquish rights to some of our technologies or drug candidates that we would otherwise pursue on our own. We do not expect to realize revenue from sales of products or royalties from licensed products in the foreseeable future, if at all, and unless and until our drug candidates are clinically tested, approved for commercialization and successfully marketed. To date, we have primarily financed our operations through the sale

of debt and equity securities. We will be required to seek additional funding in the future and currently intend to do so through collaborations, public or private equity offerings or debt financings, credit or loan facilities or a combination of one or more of these funding sources. Our ability to raise additional funds will depend on financial, economic and other factors, many of which are beyond our control. For example, financial markets may be negatively impacted by events such as pandemics or public health emergencies. Additional funds may not be available to us on acceptable terms or at all. If we raise additional funds by issuing equity securities, our stockholders will suffer dilution and the terms of any financing may adversely affect the rights of our stockholders. In addition, as a condition to providing additional funds to us, future investors may demand, and may be granted, rights superior to those of existing stockholders. Debt financing, if available, is likely to involve restrictive covenants limiting our flexibility in conducting future business activities, and, in the event of insolvency, debt holders would be repaid before holders of our equity securities received any distribution of our corporate assets.

Due to the significant resources required for the development of our drug candidates, we must prioritize development of certain drug candidates and/or certain disease indications. We may expend our limited resources on candidates or indications that do not yield a successful product and fail to capitalize on drug candidates or indications that may be more profitable or for which there is a greater likelihood of success.

We plan to continue to develop a pipeline of drug candidates to treat age-related diseases and extend human healthspan. Our clinical development strategy is initially focused on the development of senolytic medicines designed to be administered locally into diseased tissue and we are currently advancing programs in musculoskeletal, ophthalmologic, and pulmonary disorders. We are also in the early stages of developing senolytic medicines that could be administered systemically to treat additional age-related diseases, such as kidney disease, liver disease, and neurodegenerative disease. In addition to our efforts to eliminate senescent cells, we are also advancing other programs with the potential to extend human healthspan, including the administration of the administration of α-Klotho hormone.

We seek to maintain a process of prioritization and resource allocation among our programs to maintain a balance between aggressively advancing lead programs in identified indications and exploring additional indications and/or mechanisms related to diseases of aging. However, due to the significant resources required for the development of our drug candidates, we must focus on specific diseases and disease pathways and decide which drug candidates to
pursue and the amount of resources to allocate to each. Our near-term objective is to demonstrate in our clinical studies that local treatment with senolytic molecules can alter the course of an age-related disease. To accomplish this goal, we completed a Phase 1 clinical study of UBX0101 in patients with OA of the knee in the second quarter of 2019 and we initiated a Phase 2 clinical study of UBX0101 in OA in the fourth quarter of 2019. In addition, we initiated a Phase 1b clinical study of UBX0101 in OA in the first quarter of 2020. To advance our ophthalmology program, we intend to complete Investigational New Drug application, or IND, -enabling studies for our two lead drug candidates, UBX1325 and UBX1967, prior to selecting the first molecule to advance into a first-in-human clinical study. As a result, we expect to initiate a Phase 1 study for this program in the second half of 2020 and receive initial results from this study in 2021. We expect to explore multiple age-related eye diseases in our ophthalmology program.

Our decisions concerning the allocation of research, development, collaboration, management and financial resources toward particular drug candidates or therapeutic areas may not lead to the development of any viable commercial product and may divert resources away from better opportunities. Similarly, our potential decisions to delay, terminate or collaborate with third parties in respect of certain programs may subsequently also prove to be suboptimal and could cause us to miss valuable opportunities. If we make incorrect determinations regarding the viability or market potential of any of our programs or drug candidates or misread trends in the biopharmaceutical industry, particularly those segments focused on aging and healthspan, our business, financial condition and results of operations could be materially adversely affected. As a result, we may fail to capitalize on viable commercial products or profitable market opportunities, be required to forego or delay pursuit of opportunities with other drug candidates or other diseases and disease pathways that may later prove to have greater commercial potential than those we choose to pursue, or relinquish valuable rights to such drug candidates through collaboration, licensing or other royalty arrangements in cases where it may have been more advantageous for us to invest additional resources to retain development and commercialization rights.

Interim, "top-line" and preliminary data from our clinical trials that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publicly disclose top-line or preliminary data from our clinical trials, which is based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line or preliminary results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line or preliminary data also remain subject to audit and verification procedures that may result in the final data being materially different from the top-line or preliminary data we previously published. As a result, top-line and preliminary data should be viewed with caution until the final data are available.

From time to time, we may also disclose interim data from our preclinical studies and clinical trials. Interim data from clinical trials that we may conduct are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between interim data and final data could significantly harm our business prospects. Further, disclosure of interim data by us or by our competitors could result in volatility in the price of our common stock.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product, our ability to make certain claims about our products, and our company in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is material or otherwise appropriate information to include in our disclosure.

If the interim, top-line or preliminary data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, our product candidates may be harmed, which could harm our business, operating results, prospects or financial condition.

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations.

Our quarterly and annual operating results may fluctuate significantly, making it difficult for us to predict our future operating results. These fluctuations may occur due to a variety of factors, many of which are outside of our control and may be difficult to predict, including:

- the timing, cost and level of investment in research, development and, if approved, commercialization activities relating to our drug candidates, which may change from time to time;
- the timing and status of enrollment for our clinical studies;
- the cost of manufacturing our drug candidates, as well as building out our supply chain, which may vary depending on the quantity of production and the terms of our agreements with manufacturers;
- expenditures we may incur to acquire, develop or commercialize additional drug candidates and technologies;
- timing and amount of any milestone, royalty or other payments due under any collaboration or license agreement;
- future accounting pronouncements or changes in our accounting policies;

- the timing and success or failure of preclinical studies and clinical studies for our drug candidates or competing drug candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners;

- the timing of receipt of approvals for our drug candidates from regulatory authorities in the United States, or U.S., and internationally;

- coverage and reimbursement policies with respect to our drug candidates, if approved, and potential future drugs that compete with our products;

- the level of demand for our products, if approved, which may vary significantly over time; and

- potential disruption caused by unforeseen events such as pandemics and public health emergencies, like the coronavirus.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance.

This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue or earnings guidance we may provide.

Risks Related to Our Business

Our core therapeutic approach to extending human healthspan is based on our understanding of cellular senescence. Utilizing senolytic molecules to treat age-related diseases is a novel therapeutic approach, which exposes us to unforeseen risks and makes it difficult to predict the time and cost of drug development and potential for regulatory approval.

We are developing a pipeline of drug candidates to treat age-related diseases and extend human healthspan. Our foundational science and lead drug candidates are based on senescence biology. We believe that we can develop drug candidates capable of eliminating or causing the elimination of accumulated senescent cells and their associated Senescence Associated Secretory Phenotype, or SASP, when administered locally. We are also in the early stages of developing senolytic medicines that could be administered systemically to treat additional other age-related diseases such as kidney disease, liver disease, and neurodegenerative disease. In our development efforts we intend to explore senolytic medicines that use multiple modalities. However, our approach to treating age-related diseases is novel and the scientific research that forms the basis of our efforts to develop senolytic medicines is ongoing. We have only recently begun testing our senolytic molecules in humans and the majority of our current data is limited to pre-clinical animal models and *in vitro* cell lines, the results of which may not translate into humans. We currently have no conclusive evidence in humans, that the accumulation of senescent cells and resulting exposure to SASP factors is the underlying cause of tissue damage and dysfunction associated with many age-related diseases.

The indications we are currently pursuing, including OA, of the knee, and several age-related eye diseases, we believe to be heterogeneous and multifactorial diseases driven by multiple factors, including those that could potentially be SASP factors. While evidence suggests that, in each case, individual SASP factors contribute to the disease, it is our belief that modulation of multiple factors is likely needed to achieve a meaningful clinical benefit and we do not yet know which of the SASP factors might be most important in each disease or whether we can measure them. For example, our Phase 1 OA study was designed to measure up to 24 SASP factors and disease biomarkers we believe to be relevant to OA in humans. Of these 24 SASP factors and disease biomarkers, a subset of 19 in the Phase 1 OA study met criteria we established to enable meaningful measurement and analysis. Of these 19 SASP factors and disease biomarkers, ten increased or decreased in a manner we believe consistent with a

mechanism involving disease modulation, one was not consistent with such a mechanism, and changes in the remaining eight were not reliably different from the placebo arm. As such, there can be no assurances that even if we are able to develop senolytic medicines capable of eliminating or causing the elimination of senescent cells and thereby modulating their associated SASP factors, that such medicines would safely and effectively treat age-related diseases.

Further, while cellular senescence is a natural occurring biological process, the administration of senolytic medicines to eliminate or cause the elimination of accumulated senescent cells and modulating their associated SASP in humans has not been widely tested and may potentially harm healthy tissue or result in unforeseen safety events. We may also ultimately discover that our senolytic molecules do not possess certain properties required for therapeutic effectiveness, or that even if found to be effective in one type of tissue, that such molecules will be effective in other tissues. In addition, given the novel nature of this therapeutic approach, designing preclinical and clinical studies to demonstrate the effect of senolytic medicines is complex and exposes us to unforeseen risks. For example, certain of our attempts to replicate early *in vivo* findings in different animal models have proven to be challenging, for example with respect to our efforts to mimic a disease like OA, which develops over a long period of time in humans, as well as certain eye and lung diseases. In addition, the scientific evidence to support the feasibility of developing systemic senolytic medicines is both preliminary and limited. We may spend substantial funds attempting to develop these drug candidates and never succeed in doing so.

No regulatory authority has granted approval for a senolytic medicine. As such, we believe the U.S. Food and Drug Administration, or the FDA, has limited experience with senescence, which may increase the complexity, uncertainty and length of the clinical development and regulatory approval process for our drug candidates. We may never receive approval to market and commercialize any drug candidate. Even if we obtain regulatory approval, the approval may be for targets, disease indications or patient populations that are not as broad as we intended or desired or may require labeling that includes significant use or distribution restrictions or safety warnings. We may be required to perform additional or unanticipated clinical studies to obtain approval or be subject to post-marketing testing requirements to maintain marketing authorization. If our senolytic molecules prove to be ineffective, unsafe or commercially unviable, our entire senolytic platform and pipeline would have little, if any, value, which would have a material and adverse effect on our business, financial condition, results of operations and prospects.

Our business is dependent on the successful development, regulatory approval, and commercialization of our drug candidates, all of which are in early stages of development and none of which have been tested in a human subject.

We have no products approved for sale and all of our drug candidates are in early stages of development. We completed a Phase 1 clinical study of our first lead drug candidate, UBX0101, in the second quarter of 2019 and we initiated a Phase 2 clinical study of UBX0101 in the fourth quarter of 2019 and a Phase 1b clinical study of both a higher dose and repeat doses in the first quarter of 2020. To advance our ophthalmology program, we intend to complete IND-enabling studies for our two lead drug candidates, UBX1325 and UBX1967, prior to selecting the first molecule to advance into a first-in-human clinical study. As a result, we expect to initiate a Phase 1 study for this program in the second half of 2020 pursuant to which we intend to explore multiple age-related eye diseases. UBX0101 is the only drug candidate that we have administered to humans, and as such, we face significant translational risk with our drug candidates. We may also be required by the FDA or similar foreign regulatory agencies to conduct additional preclinical studies beyond those planned to support the commencement of clinical trials. For example, in preclinical studies, we observed that UBX1967 showed sustained exposure in ocular tissues of interest after intravitreal injection. After engaging the FDA regarding the design of IND-enabling studies for UBX1967, we determined that the duration of such preclinical studies would be longer than originally anticipated due to the extended exposure profile, which caused us to continue to preclinical studies of UBX1325 in parallel and delayed the commencement of our initial Phase 1 study for age-related eye diseases.

The success of our business, including our ability to finance our company and generate any revenue in the future, will primarily depend on the successful development, regulatory approval and commercialization of drug candidates from our senolytic medicine pipeline. However, given our early stage of development, it may be many years, if we succeed at all, before we have demonstrated the safety and efficacy of a drug candidate sufficient to warrant approval for commercialization.

In the future, we may also become dependent on other drug candidates that we may develop or acquire. The clinical and commercial success of our drug candidates and future drug candidates will depend on a number of factors, including the following:

- our ability to raise any additional required capital on acceptable terms, or at all;
- our ability to complete IND-enabling studies and successfully submit an IND or comparable applications in foreign jurisdictions;
- timely completion of our preclinical studies and clinical studies, which may be significantly slower or cost more than we currently anticipate and will depend substantially upon the performance of third-party contractors, some of whom could be adversely impacted by unforeseen events such as pandemics and public health emergencies, like the coronavirus;
- whether we are required by the FDA or similar foreign regulatory agencies to conduct additional clinical studies or other studies beyond those planned to support the approval and commercialization of our drug candidates or any future drug candidates;
- acceptance of our proposed indications and primary endpoint assessments relating to the proposed indications of our drug candidates by the FDA and similar foreign regulatory authorities;
- our ability to demonstrate to the satisfaction of the FDA and similar foreign regulatory authorities the safety, efficacy and acceptable risk-to-benefit profile of our lead drug candidates or any future drug candidates;
- the prevalence, duration and severity of potential side effects or other safety issues experienced with our drug candidates or future approved products, if any;
- the timely receipt of necessary marketing approvals from the FDA and similar foreign regulatory authorities;
- achieving and maintaining, and, where applicable, ensuring that our third-party contractors achieve and maintain compliance with our contractual obligations and with all regulatory requirements applicable to our lead drug candidates or any future drug candidates or approved products, if any;
- the willingness of physicians, professional societies, operators of clinics, hospitals, and patients to recommend, utilize or adopt any of our future drug candidates to treat age-related diseases;
- the ability of third parties with whom we contract to manufacture adequate clinical study and commercial supplies of our lead drug candidates or any future drug candidates, to remain in good standing with regulatory agencies and develop, validate and maintain commercially viable manufacturing processes that are compliant with current good manufacturing practices, or cGMP;
- our ability to successfully develop a commercial strategy and thereafter commercialize our drug candidates or any future drug candidates in the U.S., and internationally, if approved for marketing, reimbursement, sale and distribution in such countries and territories, whether alone or in collaboration with others;
- the convenience of our treatment or dosing regimen;
- acceptance by physicians, payors and patients of the benefits, safety and efficacy of our drug candidates or any future drug candidates, if approved, including relative to alternative and competing treatments;
- patient demand for our drug candidates, if approved;
- our ability to establish and enforce intellectual property rights in and to our drug candidates or any future drug candidates; and

- our ability to avoid third-party patent interference, intellectual property challenges or intellectual property infringement claims.

These factors, many of which are beyond our control, could cause us to experience significant delays or be unable to obtain regulatory approvals or commercialize our drug candidates. Even if regulatory approvals are obtained, we may never achieve success in commercializing any of our drug candidates. Accordingly, we cannot provide assurances that we will be able to generate sufficient revenue through the sale of our drug candidates or any future drug candidates to continue our business or achieve profitability.

We may be unable to obtain regulatory approval for our drug candidates under applicable regulatory requirements. The denial or delay of any such approval would delay commercialization of our drug candidates and adversely impact our potential to generate revenue, our business and our results of operations.

To gain approval to market our drug candidates, we must provide the FDA and foreign regulatory authorities with clinical data that adequately demonstrate the safety and efficacy of the drug candidate for the intended indication applied for in the applicable regulatory filing. For our senolytic medicines, we must also demonstrate that eliminating or causing the elimination of senescent cells and modulating relevant associated SASP factors will lead to the improvement of well-defined and measurable endpoints.

We have not previously submitted a new drug application, or NDA, or biologics license application, or BLA, to the FDA, or similar approval filings to comparable foreign regulatory authorities. An NDA, BLA or other relevant regulatory filing must include extensive preclinical and clinical data and supporting information to establish that the drug candidate is safe and effective, or that a biological drug candidate is safe, pure and potent for each desired indication. The NDA, BLA or other relevant regulatory submission must also include significant information regarding the chemistry, manufacturing and controls for the product.

The research, testing, manufacturing, labeling, approval, sale, marketing and distribution of drug and biologic products are subject to extensive regulation by the FDA and other regulatory authorities in the U.S. and other countries, and such regulations differ from country to country. We are not permitted to market our drug candidates in the U.S. or in any foreign countries until they receive the requisite approval from the applicable regulatory authorities of such jurisdictions.

The FDA or any foreign regulatory bodies can delay, limit or deny approval of our drug candidates for many reasons, including:

- our inability to demonstrate to the satisfaction of the FDA or the applicable foreign regulatory body that any of our drug candidates is safe and effective for the requested indication;

- the FDA's or the applicable foreign regulatory agency's disagreement with our trial protocol or the interpretation of data from preclinical studies or clinical studies;

- our inability to demonstrate that the clinical and other benefits of any of our drug candidates outweigh any safety or other perceived risks;

- the FDA's or the applicable foreign regulatory agency's requirement for additional preclinical studies or clinical studies;

- the FDA's or the applicable foreign regulatory agency's failure to approve the formulation, labeling or specifications of UBX0101, UBX1325, UBX1967, or any of our future drug candidates;

- the FDA's or the applicable foreign regulatory agency's failure to approve the manufacturing processes or facilities of third-party manufacturers upon which we rely; or

- the potential for approval policies or regulations of the FDA or the applicable foreign regulatory agencies to significantly change in a manner that renders our clinical data insufficient for approval.

Of the large number of biopharmaceutical and pharmaceutical products in development, only a small percentage successfully complete the FDA or other regulatory approval processes and are commercialized.

In addition, disruptions at the FDA and other regulatory agencies that are unrelated to our company or our products could also cause delays to the regulatory approval process for our products. For example, over the last several years, including in December 2018 and January 2019, the U.S. government has shut down several times and certain regulatory agencies, including the FDA, have had to furlough critical employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions.

Even if we eventually complete clinical testing and receive approval from the FDA or applicable foreign agencies for any of our drug candidates, the FDA or the applicable foreign regulatory agency may grant approval contingent on the performance of costly additional clinical studies which may be required after approval. The FDA or the applicable foreign regulatory agency also may approve our lead drug candidates for limited indications or narrower patient populations than we originally requested, and the FDA, or applicable foreign regulatory agency, may not approve our drug candidates with the labeling that we believe is necessary or desirable for the successful commercialization of such drug candidates.

Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of our drug candidates and would materially adversely impact our business and prospects.

Clinical development involves a lengthy and expensive process with an uncertain outcome, and results of earlier studies and trials may not be predictive of future trial results.

Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure or delay can occur at any time during the clinical study process. Success in preclinical studies and early clinical studies does not ensure that later clinical studies will be successful. A number of companies in the biotechnology, and pharmaceutical industries have suffered significant setbacks in clinical studies, even after positive results in earlier preclinical studies or clinical studies. These setbacks have been caused by, among other things, preclinical findings made while clinical studies were underway and safety or efficacy observations made in clinical studies, including previously unreported adverse events. The results of our preclinical animal studies or studies in *ex vivo* human tissues may not be predictive of the results of outcomes in human clinical studies. For example, our senolytic molecules may demonstrate different chemical and pharmacological properties in patients than they do in laboratory studies or may interact with human biological systems in unforeseen or harmful ways.

Additionally, with respect to our initial clinical trials for our senolytic drug candidates, we may be unable to accurately predict whether or in what manner we will be able to measure the impact of a drug candidate on relevant SASP factors and disease biomarkers. For example, in the initial single ascending dose, or SAD, portion of our Phase 1 OA study, we intended to collect synovial fluid from the knee joint; however, in a number of cases, we were unable to obtain a sufficient amount of fluid for analysis of biomarkers. As a result, we expanded the study to include a second portion for biomarker assessment. This second portion involved an additional cohort of patients and an alternative procedure, saline lavage, intended to provide a greater number of sufficient samples size for SASP and disease biomarkers assessment.

Drug candidates in later stages of clinical studies may fail to show the desired pharmacological properties or safety and efficacy traits despite having progressed through preclinical studies and initial clinical studies. Notwithstanding any promising results in earlier studies, we cannot be certain that we will not face similar setbacks. Even if we are able to initiate and complete clinical studies, the results may not be sufficient to obtain regulatory approval for our drug candidates.

Although we completed our Phase 1 clinical study of UBX0101 in OA in the second quarter of 2019 and initiated a Phase 2 clinical study of UBX0101 in OA in the fourth quarter of 2019 and a Phase 1b clinical study of UBX0101 in OA in the first quarter of 2020, we may experience delays in obtaining the FDA's authorization to initiate further clinical studies of UBX0101, in completing ongoing studies of our other drug candidates or in initiating our planned studies and trials. Additionally, we cannot be certain that studies or trials for our drug candidates will begin on time,

not require redesign, enroll an adequate number of subjects on time or be completed on schedule, if at all. Clinical studies can be prolonged, delayed or terminated for a variety of reasons, including:

- the FDA or comparable foreign regulatory authorities disagreeing with or requiring changes to the design or implementation of our clinical studies;
- delays in obtaining regulatory approval to commence or continue a trial;
- reaching agreement on acceptable terms with prospective contract research organizations, or CROs, and clinical study sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- obtaining institutional review board, or IRB, approval at each trial site;
- recruiting an adequate number of suitable patients to participate in a trial;
- having subjects complete a trial or return for post-treatment follow-up;
- encountering difficulties in gathering the range of biological data from patients needed to fully assess the impact of our drug candidates, such as the challenges we encountered in collecting synovial fluid from OA patients in the single ascending dose portion of our Phase 1 clinical study;
- clinical sites deviating from trial protocol or dropping out of a trial;
- addressing subject safety concerns that arise during the course of a trial;
- adding a sufficient number of clinical study sites; or
- obtaining sufficient product supply of drug candidate for use in preclinical studies or clinical studies from third-party suppliers some of whom could be adversely impacted by unforeseen events such as pandemics and public health emergencies, like the coronavirus.

We may experience numerous adverse or unforeseen events during, or as a result of, preclinical studies and clinical studies that could delay or prevent our ability to receive marketing approval or commercialize our drug candidates, including:

- clinical studies of our drug candidates may produce negative or inconclusive results, and we may decide, or regulators may require us, to modify clinical study design, conduct additional clinical studies or abandon drug development programs, including all of our senolytic programs;
- the number of patients required for clinical studies of our drug candidates may be larger than we anticipate, enrollment in these clinical studies may be slower than we anticipate, or participants may drop out of these clinical studies at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements, fail to maintain adequate quality controls, or be unable to provide us with sufficient product supply to conduct and complete preclinical studies or clinical studies of our drug candidates in a timely manner, or at all;
- we or our investigators might have to suspend or terminate clinical studies of our drug candidates for various reasons, including non-compliance with regulatory requirements, a finding that our drug candidates have undesirable side effects or other unexpected characteristics, a finding that the participants are being exposed to unacceptable health risks, or due to unforeseen events such as pandemics and public health emergencies, like the coronavirus;
- the cost of clinical studies of our drug candidates may be greater than we anticipate;

- the quality of our drug candidates or other materials necessary to conduct preclinical studies or clinical studies of our drug candidates may be inadequate;
- regulators may revise the requirements for approving our drug candidates, or such requirements may not be as we anticipate; and
- future collaborators may conduct clinical studies in ways they view as advantageous to them but that are suboptimal for us.

If we are required to conduct additional clinical studies or other testing of our drug candidates beyond those that we currently contemplate, if we are unable to successfully complete clinical studies of our drug candidates or other testing, if the results of these trials or tests are not positive or are only moderately positive, or if there are safety concerns, we may:

- incur unplanned costs;
- be delayed in obtaining marketing approval for our drug candidates or fail to obtain marketing approval at all;
- obtain marketing approval in some countries and not in others;
- obtain marketing approval for indications or patient populations that are not as broad as intended or desired;
- obtain marketing approval with labeling that includes significant use or distribution restrictions or safety warnings, including boxed warnings;
- be subject to additional post-marketing testing requirements; or
- have the treatment removed from the market after obtaining marketing approval.

We could also encounter delays if a clinical study is suspended or terminated by us, by the IRBs of the institutions in which such trials are being conducted, by the Data Safety Monitoring Board, or DSMB, for such trial or by the FDA or other regulatory authorities. Such authorities may suspend or terminate a clinical study due to a number of factors, including failure to conduct the clinical study in accordance with regulatory requirements or our clinical protocols, inspection of the clinical study operations or trial site by the 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 drug, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical study.

Further, conducting clinical studies in foreign countries, as we may do for certain of our drug candidates, presents additional risks that may delay completion of our clinical studies. These risks include the failure of enrolled patients in foreign countries to adhere to clinical protocol as a result of differences in healthcare services or cultural customs, managing additional administrative burdens associated with foreign regulatory schemes, as well as political and economic risks relevant to such foreign countries including those caused by unforeseen events such as pandemics and public health emergencies, like the coronavirus.

Principal investigators for our clinical studies may serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or a regulatory authority concludes that the financial relationship may have affected the interpretation of the trial, the integrity of the data generated at the applicable clinical study site may be questioned and the utility of the clinical study itself may be jeopardized, which could result in the delay or rejection of the marketing application we submit. Any such delay or rejection could prevent or delay us from commercializing our current or future drug candidates.

If we experience termination or delays in the completion of any preclinical study or clinical study of our drug candidates, the commercial prospects of our drug candidates may be harmed, and our ability to generate revenues from any of these drug candidates will be delayed or unrealized. In addition, any delays in completing our clinical studies may increase our costs, slow down our drug candidate development and approval process and jeopardize our ability to commence product sales and generate revenues. Any of these occurrences may significantly harm our business, financial condition and prospects. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical studies may also ultimately lead to the denial of regulatory approval of our drug candidates. If one or more of our drug candidates or our senescence technology generally prove to be ineffective, unsafe or commercially unviable, our platform and pipeline would have significantly diminished value, which would have a material and adverse effect on our business, financial condition, results of operations and prospects.

We may not be successful in our efforts to continue to create a pipeline of drug candidates or to develop commercially successful products. If we fail to successfully identify and develop additional drug candidates, our commercial opportunity may be limited.

We are committed to developing senolytic medicines that slow, halt or reverse age-related diseases and we are currently advancing multiple senolytic molecules to address a variety of age-related diseases, including musculoskeletal, ophthalmologic and pulmonary disorders. As senolytic medicines are not limited to intervention by a single mode of action or molecular target, we believe that we can modulate a number of biologic pathways in order to trigger the beneficial elimination of senescent cells. However, our core therapeutic approach is based on our belief that the elimination of the accumulation of senescent cells and modulation of their accompanying SASP can treat a root cause of many diseases of aging, which may never be successfully validated in a human. The indications we are currently pursuing, including OA of the knee and several age-related eye diseases, we believe to be heterogeneous and multifactorial diseases driven by multiple SASP factors. While evidence suggests that, in each case, individual SASP factors contribute to the disease, it is our belief that modulation of multiple factors is likely needed for a meaningful clinical benefit to be observed and we do not yet know which of the SASP factors will be most important or whether we can measure them.

In addition, identifying, developing, obtaining regulatory approval and commercializing drug candidates for the treatment of age-related diseases will require substantial additional funding and is prone to the risks of failure inherent in drug development. Research programs to identify drug candidates also require substantial technical, financial and human resources, regardless of whether or not any drug candidates are ultimately identified, and even if our preclinical research programs initially show promise in identifying potential drug candidates, they may fail to yield drug candidates for clinical development.

In addition, we believe that many age-related diseases will require the development of senolytic medicines that can be administered systemically and that our ability to realize the full potential of extending human healthspan will require additional non-senescence based therapeutic approaches. As a result, we intend to continue to dedicate resources and effort to better understand fundamental aging mechanisms, such as loss of circulating factors such as α-Klotho hormone, and translate these insights into human medicines. However, the scientific evidence to support the feasibility of developing systemic senolytic medicines is both preliminary and limited and our non-senolytic programs are based on emerging science. We therefore cannot provide any assurance that we will be able to successfully identify or acquire additional drug candidates, advance any of these additional drug candidates through the development process, successfully commercialize any such additional drug candidates, if approved, or assemble sufficient resources to identify, acquire, develop or, if approved, commercialize additional drug candidates. If we are unable to successfully identify, acquire, develop and commercialize additional drug candidates, our commercial opportunities may be limited.

It may be many years, if ever, before we develop senolytic medicines capable of systemic administration to treat systemic diseases of aging.

We are focusing initially on the development of senolytic molecules for age-related diseases that can be treated by means of local treatment and intend to continue our research into the development of systemic senolytic medicines. However, we are still at a very early stage of developing locally administered senolytic medicines, and we must establish proof-of-concept in humans for local treatment before developing a systemically administered senolytic

medicine. We still face significant risks in the development of localized treatments. As a result, it may be many years before we have sufficient human data and scientific understanding to effectively pursue a systemically administered senolytic medicine, if ever.

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

The timely completion of clinical studies 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. We may experience difficulties in patient enrollment in our clinical studies for a variety of reasons. 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 trial sites;
- the design of the trial;
- our ability to recruit clinical study investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions as to the potential advantages of the drug candidate being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating; and
- our ability to obtain and maintain patient consents.

In addition, our clinical studies may compete with other clinical studies for drug candidates that are in the same therapeutic areas as our drug 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 may conduct some of our clinical studies at the same clinical study sites that some of our competitors use, which will reduce the number of patients who are available for our clinical studies in such clinical study site.

Further, the administration of senolytic medicines designed to eliminate or cause the elimination of senescent cells and thereby modulate their associated SASP may result in unforeseen events, including by harming healthy tissues. As a result, it is possible that safety concerns could negatively affect patient enrollment among the patient populations that we intend to treat, including among those in indications with a low risk of mortality. Delays in patient enrollment may result in increased costs or may affect the timing or outcome of the planned clinical studies, which could prevent completion of these trials and adversely affect our ability to advance the development of our drug candidates.

Our drug candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial profile of an approved label, or result in significant negative consequences following marketing approval, if any.

Undesirable side effects caused by our drug candidates could cause us or regulatory authorities to interrupt, delay or halt clinical studies and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities. Other than in our Phase 1 clinical study of UBX0101, which was completed in the second quarter of 2019, and our ongoing Phase 2 and Phase 1b clinical studies of UBX0101, which were initiated in the fourth quarter of 2019 and the first quarter of 2020, respectively, senolytic medicines designed to eliminate or cause the elimination of senescent cells and associated SASP have never been tested in humans. As a result, even though in our completed Phase 1 clinical study UBX0101 was generally well tolerated up to the maximum administered dose of 4.0 mg in Parts A and B of the study, any clinical studies we initiate could reveal a high and unacceptable severity and prevalence of side effects, and it is possible that patients enrolled in such clinical

studies could respond in unexpected ways. For instance, in preclinical *in vivo* animal and *ex vivo* human tissue studies, our senolytic molecules have exhibited clearance of senescent cells, however the elimination of accumulated senescent cells may result in unforeseen events, including by harming healthy cells or tissues. In addition, the entry by cells into a senescent state is a natural biological process that we believe may have protective effects, such as halting the proliferation of damaged cells. The treatment of tissues with senolytic molecules could interfere with such protective processes.

If unacceptable side effects arise in the development of our drug candidates, we, the FDA, the IRBs at the institutions in which our studies are conducted, or the DSMB could suspend or terminate our clinical studies or the FDA or comparable foreign regulatory authorities could order us to cease clinical studies or deny approval of our drug candidates for any or all targeted indications. Treatment-related side effects could also affect patient recruitment or the ability of enrolled patients to complete any of our clinical studies or result in potential product liability claims. In addition, these side effects may not be appropriately recognized or managed by the treating medical staff. We expect to have to train medical personnel using our drug candidates to understand the side effect profiles for our clinical studies and upon any commercialization of any of our drug candidates. Inadequate training in recognizing or managing the potential side effects of our drug candidates could result in patient injury or death. Any of these occurrences may harm our business, financial condition and prospects significantly.

In addition, even if we successfully advance any of our drug candidates into and through clinical studies, such trials will likely only include a limited number of subjects and limited duration of exposure to our drug candidates. As a result, we cannot be assured that adverse effects of our drug candidates will not be uncovered when a significantly larger number of patients are exposed to the drug candidate. Further, clinical studies may not be sufficient to determine the effect and safety consequences of taking our drug candidates over a multi-year period. For example, even though in Parts A and B of our study of UBX0101 there were no serious adverse events and no patient discontinued because of an adverse event, there can be no assurance that it will demonstrate a similarly favorable safety profile in subsequent clinical trials.

If any of our drug candidates receives marketing approval, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw their approval of the product;
- we may be required to recall a product or change the way such product is administered to patients;
- additional restrictions may be imposed on the marketing of the particular product or the manufacturing processes for the product or any component thereof;
- regulatory authorities may require the addition of labeling statements, such as a “black box” warning or a contraindication;
- we may be required to implement a Risk Evaluation and Mitigation Strategy, or REMS, or create a Medication Guide outlining the risks of such side effects for distribution to patients;
- we could be sued and held liable for harm caused to patients;
- the product may become less competitive; and
- our reputation may suffer.

Any of the foregoing events could prevent us from achieving or maintaining market acceptance of the particular drug candidate, if approved, and result in the loss of significant revenues to us, which would materially and adversely affect our results of operations and business. In addition, if one or more of our drug candidates or our senescence approach generally prove to be unsafe, our entire platform and pipeline could be affected, which would have a material and adverse effect on our business, financial condition, results of operations and prospects.

Even if our lead drug candidates or any future drug candidates obtain regulatory approval, they may fail to achieve the broad degree of physician and patient adoption and use necessary for commercial success.

Even if one or more of our drug candidates receive FDA or other regulatory approvals, the commercial success of any of our current or future drug candidates will depend significantly on the broad adoption and use of the resulting product by physicians and patients for approved indications. Our drug candidates may not be commercially successful for a variety of reasons, including: competitive factors, pricing or physician preference, reimbursement by insurers, the degree and rate of physician and patient adoption of our current or future drug candidates. If approved, the commercial success of our drug candidates will depend on a number of factors, including:

- the clinical indications for which the product is approved and patient demand for approved products that treat those indications;
- the safety and efficacy of our product as compared to other available therapies;
- the availability of coverage and adequate reimbursement from managed care plans, insurers and other healthcare payors for any of our drug candidates that may be approved;
- acceptance by physicians, operators of clinics and patients of the product as a safe and effective treatment;
- physician and patient willingness to adopt a new therapy over other available therapies to treat approved indications;
- overcoming any biases physicians or patients may have toward particular therapies for the treatment of approved indications;
- proper training and administration of our drug candidates by physicians and medical staff;
- public misperception regarding the use of our therapies, or public bias against “anti-aging” companies;
- patient satisfaction with the results and administration of our drug candidates and overall treatment experience, including, for example, the convenience of any dosing regimen;
- the cost of treatment with our drug candidates in relation to alternative treatments and reimbursement levels, if any, and willingness to pay for the product, if approved, on the part of insurance companies and other third-party payers, physicians and patients;
- the willingness of patients to pay for certain of our products, if approved;
- the revenue and profitability that our products may offer a physician as compared to alternative therapies;
- the prevalence and severity of side effects;
- limitations or warnings contained in the FDA-approved labeling for our products;
- the willingness of physicians, operators of clinics and patients to utilize or adopt our products as a solution;
- any FDA requirement to undertake a REMS;
- the effectiveness of our sales, marketing and distribution efforts;
- adverse publicity about our products or favorable publicity about competitive products; and
- potential product liability claims.

We cannot assure you that our current or future drug candidates, if approved, will achieve broad market acceptance among physicians and patients. Any failure by our drug candidates that obtain regulatory approval to achieve market acceptance or commercial success would adversely affect our results of operations.

We rely on third-party suppliers to manufacture preclinical and clinical supplies of our drug candidates and we intend to continue to rely on third parties to produce such preclinical and clinical supplies as well as commercial supplies of any approved product. The loss of these suppliers, or their failure to comply with applicable regulatory requirements or to provide us with sufficient quantities at acceptable quality levels or prices, or at all, would materially and adversely affect our business.

We do not have the infrastructure or capability internally to manufacture supplies of our drug candidates or the materials necessary to produce our drug candidates for use in the conduct of our clinical studies, and we lack the internal resources and the capability to manufacture any of our drug candidates on a clinical or commercial scale. The facilities used by our contract manufacturers to manufacture our drug candidates are subject to various regulatory requirements and may be subject to the inspection of the FDA or other regulatory authorities. We do not control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with the regulatory requirements, known as cGMPs. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or comparable regulatory authorities in foreign jurisdictions, we may not be able to rely on their manufacturing facilities for the manufacture or our drug candidates. In addition, we have limited 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 finds these facilities inadequate for the manufacture of our drug candidates or if such facilities are subject to enforcement action in the future or are otherwise inadequate, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our drug candidates.

We currently intend to supply all of our drug candidates in all territories for our clinical development programs. We currently rely on third parties at key stages in our supply chain. For instance, the supply chains for our lead drug candidates involve several manufacturers that specialize in specific operations of the manufacturing process, specifically, raw materials manufacturing, drug substance manufacturing and drug product manufacturing. As a result, the supply chain for the manufacturing of our drug candidates is complicated and we expect the logistical challenges associated with our supply chain to grow more complex as our drug candidates progress through the clinical trial process. Some of these third parties may also be adversely impacted by unforeseen events such as pandemics and public health emergencies, like the coronavirus.

We do not have any control over the process or timing of the acquisition or manufacture of materials by our manufacturers. Further, we have not yet engaged any manufacturers for the commercial supply of our drug candidates. Although we intend to enter into such agreements prior to commercial launch of any of our drug candidates, we may be unable to enter into any such agreement or do so on commercially reasonable terms, which could have a material adverse impact upon our business. We generally do not begin a preclinical study and we do not intend to initiate any clinical studies unless we believe we have access to a sufficient supply of a drug candidate to complete such study or trial. In addition, any significant delay in, or quality control problems with respect to, the supply of a drug candidate, or the raw material components thereof, for an ongoing study or trial could considerably delay completion of our preclinical studies or future clinical studies, product testing and potential regulatory approval of our drug candidates.

Moreover, if there is a disruption to one or more of our third-party manufacturers' or suppliers' relevant operations, or if we are unable to enter into arrangements for the commercial supply of our drug candidates, we will have no other means of producing our lead drug candidates until they restore the affected facilities or we or they procure alternative manufacturing facilities or sources of supply. Our ability to progress our preclinical and clinical programs could be materially and adversely impacted if any of the third-party suppliers upon which we rely were to experience a significant business challenge, disruption or failure due to issues such as financial difficulties or bankruptcy, issues relating to other customers such as regulatory or quality compliance issues, or other financial, legal, regulatory or reputational issues.

Additionally, any damage to or destruction of our third-party manufacturers' or suppliers' facilities or equipment may significantly impair our ability to manufacture our drug candidates on a timely basis.

In addition, to manufacture our lead drug candidates in the quantities that we believe would be required to meet anticipated market demand, our third-party manufacturers would likely need to increase manufacturing capacity and, in some cases, we would need to secure alternative sources of commercial supply, which could involve significant challenges and may require additional regulatory approvals. In addition, the development of commercial-scale manufacturing capabilities may require us and our third-party manufacturers to invest substantial additional funds and hire and retain the technical personnel who have the necessary manufacturing experience. Neither we nor our third-party manufacturers may successfully complete any required increase to existing manufacturing capacity in a timely manner, or at all. If our manufacturers or we are unable to purchase the raw materials necessary for the manufacture of our drug candidates on acceptable terms, at sufficient quality levels, or in adequate quantities, if at all, the commercial launch of our lead drug candidates or any future drug candidates would be delayed or there would be a shortage in supply, which would impair our ability to generate revenues from the sale of such drug candidates, if approved.

We depend on third-party suppliers for key raw materials used in our manufacturing processes, and the loss of these third-party suppliers or their inability to supply us with adequate raw materials could harm our business.

We rely on third-party suppliers for the raw materials required for the production of our drug candidates. Our dependence on these third-party suppliers and the challenges we may face in obtaining adequate supplies of raw materials involve several risks, including limited control over pricing, availability, and quality and delivery schedules. As a small company, our negotiation leverage is limited, and we are likely to get lower priority than our competitors who are larger than we are. We cannot be certain that our suppliers will continue to provide us with the quantities of these raw materials that we require or satisfy our anticipated specifications and quality requirements. Any supply interruption in limited or sole sourced raw materials could materially harm our ability to manufacture our drug candidates until a new source of supply, if any, could be identified and qualified. We may be unable to find a sufficient alternative supply channel in a reasonable time or on commercially reasonable terms. Any performance failure on the part of our suppliers could delay the development and potential commercialization of our drug candidates, including limiting supplies necessary for clinical studies and regulatory approvals, which would have a material adverse effect on our business.

We rely on third parties in the conduct of critical portions of our preclinical studies and intend to rely on third parties in the conduct of critical portions of our future clinical studies. If these third parties do not successfully carry out their contractual duties, fail to comply with applicable regulatory requirements or meet expected deadlines, we may be unable to obtain regulatory approval for our drug candidates. Some of these third parties may also be adversely impacted by unforeseen events such as pandemics and public health emergencies, like the coronavirus.

We currently do not have the ability to independently conduct preclinical studies that comply with the regulatory requirements known as good laboratory practice, or GLP, requirements. We also do not currently have the ability to independently conduct any clinical studies. The FDA and regulatory authorities in other jurisdictions require us to comply with regulations and standards, commonly referred to as good clinical practice, or GCP, requirements for conducting, monitoring, recording and reporting the results of clinical studies, in order to ensure that the data and results are scientifically credible and accurate and that the trial subjects are adequately informed of the potential risks of participating in clinical studies. We rely on medical institutions, clinical investigators, contract laboratories and other third parties, such as CROs, to conduct GLP-compliant preclinical studies and GCP-compliant clinical studies on our drug candidates properly and on time. While we have agreements governing their activities, we control only certain aspects of their activities and have limited influence over their actual performance. The third parties with whom we contract for execution of our GLP-compliant preclinical studies and our GCP-compliant clinical studies play a significant role in the conduct of these studies and trials and the subsequent collection and analysis of data. These third parties are not our employees and, except for restrictions imposed by our contracts with such third parties, we have limited ability to control the amount or timing of resources that they devote to our programs. Although we rely on these third parties to conduct our GLP-compliant preclinical studies and GCP-compliant clinical studies, we remain responsible for ensuring that each of our GLP preclinical studies and clinical studies is conducted in accordance with its investigational plan and protocol and applicable laws and regulations, and our reliance on the CROs does not relieve us of our regulatory responsibilities.

Many of the third parties with whom we contract may also have relationships with other commercial entities, potentially including our competitors, for whom they may also be conducting clinical studies or other drug development activities that could harm our competitive position. If the third parties conducting our preclinical studies or our clinical studies do not adequately perform their contractual duties or obligations, experience significant business challenges, disruptions or failures, do not meet expected deadlines, terminate their agreements with us or need to be replaced, or if the quality or accuracy of the data they obtain is compromised due to their failure to adhere to our protocols or to GCPs, or for any other reason, we may need to enter into new arrangements with alternative third parties. This could be difficult, costly or impossible, and our preclinical studies or clinical studies may need to be extended, delayed, terminated or repeated. As a result, we may not be able to obtain regulatory approval in a timely fashion, or at all, for the applicable drug candidate, our financial results and the commercial prospects for our drug candidates would be harmed, our costs could increase, and our ability to generate revenues could be delayed.

We are currently conducting and will continue to conduct preclinical trials and contract with third-party manufacturers in foreign countries, which could expose us to risks that could have a material adverse effect on the success of our business.

We have conducted in the past and are currently conducting preclinical trials in the United States, Canada and China and contract with third-party suppliers in the United States, China and Denmark. Accordingly, we are subject to risks associated with doing business globally, including commercial, political, and financial risks. In addition, we are subject to potential disruption caused by military conflicts; potentially unstable governments or legal systems; civil or political upheaval or unrest; local labor policies and conditions; possible expropriation, nationalization, or confiscation of assets; problems with repatriation of foreign earnings; economic or trade sanctions; closure of markets to imports; anti-American sentiment; terrorism or other types of violence in or outside the United States; health pandemics; and a significant reduction in global travel. For example, pandemics and public health emergencies, such as the coronavirus, could disrupt the ability of our third-party service providers, including Wuxi AppTec (Hong Kong) Limited, which conducts certain preclinical studies of our drug candidates in China pursuant to a services agreement we entered into in 2016, to provide us with services that are critical to the development of our drug candidates. Our success will depend, in part, on our ability to overcome the challenges we encounter with respect to these risks and other factors affecting U.S. companies with global operations. If our global clinical trials or foreign third-party suppliers were to experience significant disruption due to these risks or for other reasons, it could have a material adverse effect on our business, financial condition, results of operations and prospects.

We face significant competition in an environment of rapid technological and scientific change, and our drug candidates, if approved, will face significant competition and our failure to effectively compete may prevent us from achieving significant market penetration. Most of our competitors have significantly greater resources than we do, and we may not be able to successfully compete.

The biotechnology and pharmaceutical industries in particular are characterized by rapidly advancing technologies, intense competition and a strong emphasis on developing proprietary therapeutics. Numerous companies are engaged in the development, patenting, manufacturing and marketing of healthcare products competitive with those that we are developing. We face competition from a number of sources, such as pharmaceutical companies, generic drug companies, biotechnology companies and academic and research institutions, many of which have greater financial resources, marketing capabilities, sales forces, manufacturing capabilities, research and development capabilities, clinical study expertise, intellectual property portfolios, experience in obtaining patents and regulatory approvals for drug candidates and other resources than we do. Some of the companies that offer competing products also have a broad range of other product offerings, large direct sales forces and long-term customer relationships with our target physicians, which could inhibit our market penetration efforts. Mergers and acquisitions in the pharmaceutical industry 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. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical study sites and patient registration for clinical studies, as well as in acquiring technologies complementary to, or necessary for, our programs. In addition, certain of our drug candidates, if approved, may compete with other products that treat age-

related diseases, including over the counter, or OTC, treatments, for a share of some patients' discretionary budgets and for physicians' attention within their clinical practices.

We are aware of other companies seeking to develop treatments to prevent or treat aging-related diseases through various biological pathways, including Calico and resTORbio. Within our three leading senolytic programs, our drug candidates would compete against current therapies from a wide range of companies and technologies, including:

- Musculoskeletal diseases, including osteoarthritis: current standard of care treatments (though not disease-modifying and focused on symptom management) include non-steroidal anti-inflammatory drugs (ibuprofen, diclofenac, celecoxib), intra-articular steroids (triamcinolone), analgesic pain relief (Acetaminophen), or narcotic pain relief (tramadol).

- Ophthalmology diseases, including diabetic retinopathy: current standard of care treatments include anti-VEGF antibodies (bevacizumab, ranibizumab, aflibercept, brolucizumab); intravitreal steroid (dexamethasone); and pan-retinal photocoagulation by laser for both neovascular AMD, DR, and DME. There is no currently available treatment for geographic atrophy form of AMD. There are potentially disease-modifying therapeutics are being developed by several pharmaceutical and biotechnology companies, including Roche/Genentech and Regeneron.

- Pulmonary disease, including idiopathic pulmonary fibrosis: therapeutics are being sold and developed by several pharmaceutical and biotechnology companies and academic institutions, including Genentech, Boehringer-Ingelheim, Cytokinetics and Mallinckrodt, and are in various stages of clinical studies.

Further, we believe that potential competitors may be able to develop senolytic medicines utilizing well-established molecules and pathways, which could enable the development of competitive drug candidates utilizing the same cellular senescence biological theories.

Certain alternative treatments offered by competitors may be available at lower prices and may offer greater efficacy or better safety profiles. Furthermore, currently approved products could be discovered to have application for treatment of age-related diseases generally, which could give such products significant regulatory and market timing advantages over any of our drug candidates. Our competitors also may obtain FDA, EMA or other regulatory approval for their products more rapidly than we may obtain approval for ours and may obtain orphan product exclusivity from the FDA for indications our drug candidates are targeting, which could result in our competitors establishing a strong market position before we are able to enter the market. Newly developed systemic or non-systemic treatments that replace existing therapies that currently are only utilized in patients suffering from severe disease may also have lessened side effects or reduced prices compared to current therapies, which make them more attractive for patients suffering from mild to moderate disease. Even if a generic or OTC product is less effective than our drug candidates, it may be more quickly adopted by physicians and patients than our competing drug candidates based upon cost or convenience.

The successful commercialization of our drug candidates will depend in part on the extent to which governmental authorities and health insurers establish adequate coverage, reimbursement levels and pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for our drug candidates, if approved, could limit our ability to market those products and decrease our ability to generate revenue.

The availability and adequacy of coverage and reimbursement by governmental healthcare programs such as Medicare and Medicaid, private health insurers and other third-party payors are essential for most patients to be able to afford prescription medications such as our drug candidates, assuming FDA approval. Our ability to achieve acceptable levels of coverage and reimbursement for products by governmental authorities, private health insurers and other organizations will have an effect on our ability to successfully commercialize our drug candidates. Assuming we obtain coverage for our drug candidates by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. We cannot be sure that coverage and reimbursement in the U.S., the EU or elsewhere will be available for our drug candidates or any

product that we may develop, and any reimbursement that may become available may be decreased or eliminated in the future.

Third-party payors increasingly are challenging prices charged for pharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs or biologics when an equivalent generic drug, biosimilar or a less expensive therapy is available. It is possible that a third-party payor may consider our drug candidates as substitutable and only offer to reimburse patients for the cost of the less expensive product. Even if we show improved efficacy or improved convenience of administration with our drug candidates, pricing of existing third-party therapeutics may limit the amount we will be able to charge for our drug candidates. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable us to realize an appropriate return on our investment in our drug candidates. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize our drug candidates and may not be able to obtain a satisfactory financial return on our investment in the development of drug candidates.

There is significant uncertainty related to the insurance coverage and reimbursement of newly-approved products. In the U.S., third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs and biologics will be covered. The Medicare and Medicaid programs increasingly are used as models in the U.S. for how private payors and other governmental payors develop their coverage and reimbursement policies for drugs and biologics. Some third-party payors may require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. We cannot predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our drug candidates.

No uniform policy for coverage and reimbursement for products exists among third-party payors in the U.S. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. 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 drug candidates to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases on short notice, and we believe that changes in these rules and regulations are likely.

Outside the U.S., international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe and other countries have and will continue to put pressure on the pricing and usage of our drug candidates. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medical products but monitor and control company profits.

Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our drug candidates. Accordingly, in markets outside the U.S., the reimbursement for our drug candidates may be reduced compared with the U.S. and may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and third-party payors in the U.S. 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 drug candidates. We expect to experience pricing pressures in connection with the sale of our drug candidates due to the trend toward managed health care, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and biologics and surgical procedures and other treatments, has become intense. As a result, increasingly high barriers are being erected to the entry of new products.

We currently have no sales organization. If we are unable to establish sales capabilities on our own or through third parties, we may not be able to market and sell our drug candidates effectively in the U.S. and foreign jurisdictions, if approved, or generate product revenue.

We currently do not have a marketing or sales organization. In order to commercialize our drug candidates in the U.S. and foreign jurisdictions, we must build our marketing, sales, distribution, managerial and other non-technical capabilities or make arrangements with third parties to perform these services, and we may not be successful in doing so. If any of our drug candidates receive regulatory approval, we expect to establish a sales organization with technical expertise and supporting distribution capabilities to commercialize each such drug candidate, which will be expensive and time consuming. We have no prior experience in the marketing, sale and distribution of pharmaceutical products and there are significant risks involved in building and managing a sales organization, including our ability to hire, retain, and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel, and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of these products. We may choose to collaborate with third parties that have direct sales forces and established distribution systems, either to augment our own sales force and distribution systems or in lieu of our own sales force and distribution systems. If we are unable to enter into such arrangements on acceptable terms or at all, we may not be able to successfully commercialize our drug candidates. If we are not successful in commercializing our drug candidates or any future drug candidates, either on our own or through arrangements with one or more third parties, we may not be able to generate any future product revenue and we would incur significant additional losses.

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

As of March 1, 2020, we had 98 full-time employees. We will need to continue to expand our managerial, operational, finance and other resources in order to manage our operations and clinical studies, continue our development activities and commercialize our lead drug candidates or any future drug candidates. Our management and personnel, systems and facilities currently in place may not be adequate to support this future growth. Our need to effectively execute our growth strategy requires that we:

- manage our clinical studies effectively;
- identify, recruit, retain, incentivize and integrate additional employees, including sales personnel;
- manage our internal research, development and operational efforts effectively while carrying out our contractual obligations to third parties; and
- continue to improve our operational, financial and management controls, reports systems and procedures.

If we fail to attract and retain senior management and key scientific personnel, we may be unable to successfully develop our lead drug candidates or any future drug candidates, conduct our clinical studies and commercialize our current or any future drug candidates.

Our success depends in part on our continued ability to attract, retain and motivate highly qualified management, clinical and scientific personnel. We are highly dependent upon our senior management as well as our senior scientists. In early March 2020, we announced that our Chairman and Chief Executive Officer, Keith R. Leonard, would resign from his position as Chief Executive Officer and that Anirvan Ghosh, Ph.D. had been appointed to replace him effective as of March 30, 2020. Although Mr. Leonard will continue to serve as Chairman of our Board of Directors, disruption caused by the transition or by the loss of ongoing services of any other members of our senior management team or our senior scientists could delay or prevent the successful development of our product pipeline, initiation or completion of our planned clinical studies or the commercialization of our lead drug candidates or any future drug candidates. In addition, in the months following the Chief Executive Officer transition it may be more difficult to evaluate the effectiveness, on an individual or collective basis, of our senior management team and its ability to address future challenges to our business.

Competition for qualified personnel in the biotechnology and pharmaceuticals field is intense due to the limited number of individuals who possess the skills and experience required by our industry. We will need to hire additional personnel as we expand our clinical development and if we initiate commercial activities. We may not be able to attract and retain quality personnel on acceptable terms, or at all. In addition, to the extent we hire personnel

from competitors, we may be subject to allegations that they have been improperly solicited or that they have divulged proprietary or other confidential information, or that their former employers own their research output.

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

We face an inherent risk of product liability as a result of the clinical testing of our drug candidates and will face an even greater risk if we commercialize any products. For example, we may be sued if any product we develop allegedly causes injury or is found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, and a failure to warn of dangers inherent in the product, negligence, strict liability, and a breach of warranty. 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 drug candidates.

Even a 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 current or future drug candidates;
- injury to our reputation;
- withdrawal of clinical study participants;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- regulatory investigations, product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue; and
- the inability to commercialize our current or any future drug candidates.

Our inability to obtain and maintain sufficient product liability insurance at an acceptable cost and scope of coverage to protect against potential product liability claims could prevent or inhibit the commercialization of our current or any future drug candidates we develop. We currently carry product liability insurance covering our clinical studies. Although we maintain such insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies also have various exclusions and deductibles, and we may be subject to a product liability claim for which we have no coverage. We will 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 funds to pay such amounts. Moreover, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses. If and when we obtain approval for marketing any of our drug candidates, we intend to expand our insurance coverage to include the sale of such drug candidate; however, we may be unable to obtain this liability insurance on commercially reasonable terms or at all.

Our existing collaborations as well as additional collaboration arrangements that we may enter into in the future may not be successful, which could adversely affect our ability to develop and commercialize our drug candidates.

We utilize external collaborations and currently maintain approximately five active early-stage research and discovery focused collaborations. In the future, we may seek additional collaboration arrangements for the commercialization, or potentially for the development, of certain of our drug candidates depending on the merits of

retaining commercialization rights for ourselves as compared to entering into collaboration arrangements. To the extent that we decide to enter into additional collaboration agreements in the future, we may face significant competition in seeking appropriate collaborators. Moreover, collaboration arrangements are complex and time-consuming to negotiate, document, implement and maintain and challenging to manage. We may not be successful in our efforts to prudently manage our existing collaborations or to enter new ones should we chose to do so. The terms of new collaborations, or other arrangements that we may establish may not be favorable to us.

The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators and partners. Collaborations are subject to numerous risks, which may include risks that:

- collaborators and partners have significant discretion in determining the efforts and resources that they will apply to collaborations and they may not devote the level of effort or resources we expect;

- collaborators may not pursue development and commercialization of our drug candidates or may elect not to continue or renew development or commercialization programs based on clinical study results, changes in their strategic focus due to their acquisition of competitive products or their internal development of competitive products, availability of funding or other external factors, such as a business combination that diverts resources or creates competing priorities;

- collaborators may delay clinical studies, provide insufficient funding for a clinical study program, stop a clinical study, abandon a drug candidate, repeat or conduct new clinical studies or require a new formulation of a drug candidate for clinical testing;

- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our products or drug candidates;

- a collaborator with marketing, manufacturing and distribution rights to one or more products may not commit sufficient resources to or otherwise not perform satisfactorily in carrying out these activities;

- we could grant exclusive rights to our collaborators that would prevent us from collaborating with others;

- collaborators may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;

- disputes may arise between us and a collaborator that cause the delay or termination of the research, development or commercialization of our current or future drug candidates or that result in costly litigation or arbitration that diverts management attention and resources;

- collaborations may be terminated, resulting in a need for additional capital to pursue further development or commercialization of the applicable current or future drug candidates;

- collaborators may own or co-own intellectual property covering products that results from our collaborating with them, and in such cases, we would not have the exclusive right to develop or commercialize such intellectual property;

- disputes may arise with respect to the ownership of any intellectual property developed pursuant to our collaborations; and

- a collaborator’s sales and marketing activities or other operations may not be in compliance with applicable laws resulting in civil or criminal proceedings.

Unfavorable global economic or political conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets. Furthermore, the market for products with the potential to treat age-related diseases, particularly those affecting large populations in a wide range of geographic locations, may be particularly vulnerable to unfavorable economic conditions. A global financial crisis or a global or regional political disruption could cause extreme volatility in the capital and credit markets. A severe or prolonged economic downturn or political disruption could result in a variety of risks to our business, including weakened demand for our lead drug candidates or any future drug candidates, if approved, and our ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy or political disruption could also strain our manufacturers or suppliers, possibly resulting in supply disruption, or cause our customers to delay making payments for our services. Weakened or delining economic conditions could be caused by a number of factors including pandemics and public health emergencies, like the coronavirus. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the political or economic climate and financial market conditions could adversely impact our business.

We or the third parties upon whom we depend may be adversely affected by earthquakes, other natural disasters or unforeseen pandemics and public health emergencies, like the coronavirus, and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Our corporate headquarters and other facilities are located in the San Francisco Bay Area, which in the past has experienced both severe earthquakes and wildfires. Although we carry earthquake insurance, it is limited in scope. Earthquakes, wildfires or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects.

If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as our enterprise financial systems or manufacturing resource planning and enterprise quality systems, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible, for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business. Measures taken in response to a pandemnic, such as the coronavirus, which causes a public health emergency, could also disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects.

Furthermore, integral parties in our supply chain are similarly vulnerable to natural disasters or other sudden, unforeseen and severe adverse events. If such an event were to affect our supply chain, it could have a material adverse effect on our business.

Significant disruptions of information technology systems or breaches of data security could materially adversely affect our business, results of operations and financial condition.

We collect and maintain information in digital form that is necessary to conduct our business, and we are increasingly dependent on information technology systems and infrastructure to operate our business. In the ordinary course of our business, we collect, store and transmit large amounts of confidential information, including intellectual property, proprietary business information and personal information. It is critical that we do so in a secure manner to maintain the confidentiality and integrity of such confidential information. We have established physical, electronic and organizational measures to safeguard and secure our systems to prevent a data compromise, and rely on commercially available systems, software, tools, and monitoring to provide security for our information technology systems and the processing, transmission and storage of digital information. We have also outsourced elements of our information technology infrastructure, and as a result a number of third-party vendors may or could have access to our confidential information. Our internal information technology systems and infrastructure, and those of our current and any future collaborators, contractors and consultants and other third parties on which we rely, are vulnerable to damage from computer viruses, malware, natural disasters, terrorism, war, telecommunication

and electrical failures, cyberattacks or cyber-intrusions over the Internet, attachments to emails, persons inside our organization, or persons with access to systems inside our organization.

The risk of a security breach or disruption, particularly through cyber-attacks or cyber intrusion, including by computer hackers, foreign governments and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. In addition, the prevalent use of mobile devices that access confidential information increases the risk of data security breaches, which could lead to the loss of confidential information or other intellectual property. The costs to us to mitigate network security problems, bugs, viruses, worms, malicious software programs and security vulnerabilities could be significant, and while we have implemented security measures to protect our data security and information technology systems, our efforts to address these problems may not be successful, and these problems could result in unexpected interruptions, delays, cessation of service and other harm to our business and our competitive position. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our product development programs. For example, the loss of clinical study data from completed or ongoing or planned clinical studies could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data.

Moreover, if a computer security breach affects our systems or results in the unauthorized release of personally identifiable information, our reputation could be materially damaged. In addition, such a breach may require notification to governmental agencies, the media or individuals pursuant to various federal and state privacy and security laws, if applicable, including the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Clinical Health Act of 2009, and its implementing rules and regulations, as well as regulations promulgated by the Federal Trade Commission and state breach notification laws. We would also be exposed to a risk of loss or litigation and potential liability, which could materially adversely affect our business, results of operations and financial condition.

Our employees and independent contractors, including principal investigators, consultants, commercial collaborators, service providers and other vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could have an adverse effect on our results of operations.

We are exposed to the risk that our employees and independent contractors, including principal investigators, consultants, any future commercial collaborators, service providers and other vendors may engage in misconduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or other unauthorized activities that violate the laws and regulations of the FDA and other similar regulatory bodies, including those laws that require the reporting of true, complete and accurate information to such regulatory bodies; manufacturing standards; U.S. federal and state healthcare fraud and abuse, data privacy laws and other similar non-U.S. laws; or laws that require the true, complete and accurate reporting of financial information or data. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical studies, the creation of fraudulent data in our preclinical studies or clinical studies, or illegal misappropriation of product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third-parties, and the precautions we take to detect and prevent this activity 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. In addition, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. 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 and financial results, including, without limitation, the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgements, possible exclusion from participation in Medicare, Medicaid and other U.S. healthcare programs, individual imprisonment, other sanctions, 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.

Our business involves the use of hazardous materials and we and our third-party manufacturers and suppliers must comply with environmental laws and regulations, which can be expensive and restrict how we do business.

Our research and development activities and our third-party manufacturers' and suppliers' activities involve the controlled storage, use and disposal of hazardous materials owned by us, including the components of our product and drug candidates and other hazardous compounds. We and any third-party manufacturers and suppliers we engage are subject to numerous federal, state and local environmental, health and safety laws, regulations and permitting requirements, including those governing laboratory procedures; the generation, handling, use, storage, treatment, and disposal of hazardous and regulated materials and wastes; the emission and discharge of hazardous materials into the ground, air and water; and employee health and safety. Our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Our operations also produce hazardous waste. In some cases, these hazardous materials and various wastes resulting from their use are stored at our and our manufacturers' facilities pending their use and disposal. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination, 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. Under certain environmental laws, we could be held responsible for costs relating to any contamination at our current or past facilities and at third-party facilities. 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.

Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our research, product development and manufacturing efforts. In addition, we cannot entirely eliminate the risk of accidental injury or contamination from these materials or wastes. 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, this insurance may not provide adequate coverage against potential liabilities. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty, and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical studies or regulatory approvals could be suspended, which could have a material adverse effect on our business, results of operations and financial condition.

Risks Related to Intellectual Property

Our senolytic medicine platform and any future products that we commercialize could be alleged to infringe patent rights and other proprietary rights of third parties, which may require costly litigation and, if we are not successful, could cause us to pay substantial damages and/ or limit our ability to commercialize our products.

Our commercial success depends on our ability to develop, manufacture and market our senolytic medicines and future drug candidates and use our proprietary technology without infringing the patents and other proprietary rights of third parties. Intellectual property disputes can be costly to defend and may cause our business, operating results and financial condition to suffer. We operate in an industry with extensive intellectual property litigation. As the biopharmaceutical and pharmaceutical industries expand and more patents are issued, the risk increases that there may be patents issued to third parties that relate to our products and technology of which we are not aware or that we may need to challenge to continue our operations as currently contemplated.

Whether merited or not, we may face allegations that we have infringed the trademarks, copyrights, patents and other intellectual property rights of third parties, including patents held by our competitors or by non-practicing entities. We may also face allegations that our employees have misappropriated the intellectual property rights of their former employers or other third parties.

Litigation may make it necessary to defend ourselves by determining the scope, enforceability and validity of third-party proprietary rights, or to establish our proprietary rights. Regardless of whether claims that we are infringing patents or other intellectual property rights have merit, the claims can be time consuming, divert management attention and financial resources and are costly to evaluate and defend. Results of any such litigation are difficult to predict and may require us to stop treating certain conditions, obtain licenses or modify our products and features while we develop non-infringing substitutes, or may result in significant settlement costs. For example, litigation can involve substantial damages for infringement (and if the court finds that the infringement was willful, we could be ordered to pay treble damages and the patent owner's attorneys' fees), and the court could prohibit us from selling or licensing our products unless the third party licenses rights to us, which it is not required to do at a commercially reasonable price or at all. If a license is available from a third party, we may have to pay substantial royalties, upfront fees or grant cross-licenses to intellectual property rights for our products. We may also have to redesign our products so they do not infringe third-party intellectual property rights, which may not be possible at all or may require substantial monetary expenditures and time, during which our products may not be available for manufacture, use, or sale.

In addition, patent applications in the U.S. and many international jurisdictions are typically not published until 18 months after the filing of certain priority documents (or, in some cases, are not published until they issue as patents) and publications in the scientific literature often lag behind actual discoveries. Thus, we cannot be certain that others have not filed patent applications or made public disclosures relating to our technology or our contemplated technology. A third party may have filed, and may in the future file, patent applications covering our products or technology similar to ours. Any such patent application may have priority over our patent applications or patents, which could further require us to obtain rights to issued patents covering such technologies. If another party has filed a U.S. patent application on inventions similar to ours, depending on whether the timing of the filing date falls under certain patent laws, we may have to participate in a priority contest (such as an interference proceeding) declared by the U.S. Patent and Trademark Office, to determine priority of invention in the U.S. The costs of patent and other proceedings could be substantial, and it is possible that such efforts would be unsuccessful if it is determined that the other party had independently arrived at the same or similar invention prior to our own invention, resulting in a loss of our U.S. patent position with respect to such inventions.

From time to time, we may be subject to legal proceedings and claims in the ordinary course of business with respect to intellectual property. Although we are not currently subject to any claims from third parties asserting infringement of their intellectual property rights, in the future, we may receive claims from third parties asserting infringement of their intellectual property rights. Future litigation may be necessary to establish our intellectual property rights or to defend ourselves by determining the scope, enforceability and validity of third-party intellectual property rights. There can be no assurance with respect to the outcome of any current or future litigation brought by or against us, and the outcome of any such litigation could have a material adverse impact on our business, operating results and financial condition. Litigation is inherently unpredictable and outcomes are uncertain. Further, as the costs and outcome of these types of claims and proceedings can vary significantly, it is difficult to estimate potential losses that may occur. Accordingly, we are unable at this time to estimate the effects of these potential future lawsuits on our financial condition, operations or cash flows.

Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock. Finally, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations.

If we are unable to obtain, maintain and enforce intellectual property protection directed to our senolytic medicine platform and any future technologies that we develop, others may be able to make, use, or sell products substantially the same as ours, which could adversely affect our ability to compete in the market.

As of March 1, 2020, we own, co-own, or have an exclusive license or exclusive option to license in certain fields of use to more than 140 patents and pending applications in the United States and foreign jurisdictions. This portfolio

includes 36 issued and allowed U.S. patents and applications and 18 granted and allowed foreign patents and applications, respectively.

We have not pursued or maintained, and may not pursue or maintain in the future, patent protection for our products in every country or territory in which we may sell our products. In addition, we cannot be sure that any of our pending patent applications or pending trademark applications will issue or that, if issued, they will issue in a form that will be advantageous to us. The U.S. Patent and Trademark Office, or the USPTO, international patent offices or judicial bodies may deny or significantly narrow claims made under our patent applications and our issued patents may be successfully challenged, may be designed around, or may otherwise be of insufficient scope to provide us with protection for our commercial products. Further, the USPTO, international trademark offices or judicial bodies may deny our trademark applications and, even if published or registered, these trademarks may not effectively protect our brand and goodwill. Like patents, trademarks also may be successfully opposed or challenged.

We cannot be certain that the steps we have taken will prevent unauthorized use or unauthorized reverse engineering of our technology. Moreover, third parties may independently develop technologies that are competitive with ours and such competitive technologies may or may not infringe our intellectual property. The enforcement of our intellectual property rights also depends on the success of our legal actions against these infringers in the respective country or forum, but these actions may not be successful. As with all granted intellectual property, such intellectual property may be challenged, invalidated or circumvented, may not provide specific protection and/or may not prove to be enforceable in actions against specific alleged infringers.

The market for biopharmaceuticals, pharmaceuticals and treatments for age-related diseases is highly competitive and subject to rapid technological change. Our success depends, in part, upon our ability to maintain a competitive position in the development and protection of technologies and products for use in these fields and upon our ability to obtain, maintain and enforce our intellectual property rights in connection therewith. We seek to obtain and maintain patents and other intellectual property rights to restrict the ability of others to market products that misappropriate our technology and/or infringe our intellectual property to unfairly and illegally compete with our products. If we are unable to protect our intellectual property and proprietary rights, our competitive position and our business could be harmed, as third parties may be able to make, use, or sell products that are substantially the same as ours without incurring the sizeable development and licensing costs that we have incurred, which would adversely affect our ability to compete in the market.

We use a combination of patents, trademarks, know-how, confidentiality procedures and contractual provisions to protect our proprietary technology. However, these protections may not be adequate and may not provide us with any competitive advantage. For example, patents may not issue from any of our currently pending or any future patent applications, and our issued patents and any future patents that may issue may not survive legal challenges to their scope, validity or enforceability, or provide significant protection for us.

If we or one of our current or future collaborators were to initiate legal proceedings against a third party to enforce a patent covering one of our lead drug candidates or future drug candidates, the defendant could counterclaim that our patent is invalid and/or unenforceable. In patent litigation in the U.S., defendant counterclaims alleging invalidity and/or unenforceability are commonplace.

Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may also raise similar claims before the USPTO, even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable.

With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our drug candidates. Such a loss of patent protection would have a material adverse impact on our business.

Even if our patents are determined by a court to be valid and enforceable, they may not be interpreted sufficiently broadly to prevent others from marketing products similar to ours or designing around our patents. For example, third parties may be able to make products that are similar to ours but that are not covered by the claims of our patents. Third parties may assert that we or our licensors were not the first to make the inventions covered by our issued patents or pending patent applications. The claims of our issued patents or patent applications when issued may not cover our proposed commercial technologies or the future products that we develop. We may not have freedom to commercialize unimpeded by the patent rights of others. Third parties may have dominating, blocking, or other patents relevant to our technology of which we are not aware. There may be prior public disclosures or art that could be deemed to invalidate one or more of our patent claims. Further, we may not develop additional proprietary technologies in the future, and, if we do, they may not be patentable.

Patent law can be highly uncertain and involve complex legal and factual questions for which important principles remain unresolved. In the U.S. and in many international jurisdictions, policy regarding the breadth of claims allowed in patents can be inconsistent. The U.S. Supreme Court and the Court of Appeals for the Federal Circuit have made, and will likely continue to make, changes in how the patent laws of the U.S. are interpreted. Similarly, international courts have made, and will likely continue to make, changes in how the patent laws in their respective jurisdictions are interpreted. We cannot predict future changes in the interpretation of patent laws or changes to patent laws that might be enacted into law by U.S. and international legislative bodies. Those changes may materially affect our patents, our ability to obtain patents or the patents and patent applications of our licensors.

Patent reform legislation in the U.S. could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. For example, on September 16, 2011, the Leahy-Smith America Invents Act, or Leahy-Smith Act, was signed into law. The Leahy-Smith Act included a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications are prosecuted, redefine prior art, may affect patent litigation, and switch the U.S. patent system from a “first-to-invent” system to a “first-to-file” system. Under a “first-to-file” system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. The U.S. Patent and Trademark Office recently developed new regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first-to-file provisions, only became effective on March 16, 2013. The Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, which could have a material adverse effect on our business and financial condition.

In addition, we have a number of international patents and patent applications and expect to continue to pursue patent protection in many of the significant markets in which we intend to do business. The laws of some international jurisdictions may not protect intellectual property rights to the same extent as laws in the U.S., and many companies have encountered significant difficulties in obtaining, protecting, and defending such rights in international jurisdictions. If we encounter such difficulties or we are otherwise precluded from effectively protecting our intellectual property rights in international jurisdictions, our business prospects could be substantially harmed.

Varying filing dates in international countries may also permit intervening third parties to allege priority to certain technology.

Patent terms may be shortened or lengthened by, for example, terminal disclaimers, patent term adjustments, supplemental protection certificates, and patent term extensions. Patent term extensions and supplemental protection certificates, and the like, may be impacted by the regulatory process and may not significantly lengthen the patent term. Non-payment or delay in payment of patent fees or annuities, delay in patent filings or delay in extension filing (including any patent term extension or adjustment filing), whether intentional or unintentional, may also result in the loss of patent rights important to our business. Certain countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to other parties. In addition, many countries limit the enforceability of patents against other parties, including government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of any patents.

In addition to the protection afforded by patents, we rely on confidentiality agreements to protect confidential information and proprietary know how that is not patentable or that we elect not to patent, processes for which patents are difficult to enforce and any other elements of our drug candidate discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants, scientific advisors and contractors. We cannot guarantee that we have entered into such agreements with each party that may have or have had access to our confidential information or proprietary technology and processes. We also seek to preserve the integrity and confidentiality of our data and other confidential information by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures may be breached and detecting the disclosure or misappropriation of confidential information and enforcing a claim that a party illegally disclosed or misappropriated confidential information is difficult, expensive and time-consuming, and the outcome is unpredictable. Further, we may not be able to obtain adequate remedies for any breach. In addition, our confidential information may otherwise become known or be independently discovered by competitors, in which case 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. We may in the future rely on trade secret protection, which would be subject to the risks identified above with respect to confidential information.

Monitoring unauthorized use of our intellectual property is difficult and costly. From time to time, we review our competitors' products, and may in the future seek to enforce our patents or other rights against potential infringement. However, the steps we have taken to protect our proprietary rights may not be adequate to prevent misappropriation of our intellectual property. We may not be able to detect unauthorized use of, or take appropriate steps to enforce, our intellectual property rights. Our competitors may also independently develop similar technology. Any inability to meaningfully protect our intellectual property could result in competitors offering products that incorporate our product or service features, which could reduce demand for our products. In addition, we may need to defend our patents from third-party challenges, such as (but not limited to) interferences, derivation proceedings, reexamination proceedings, post-grant review, inter partes review, third-party submissions, oppositions, nullity actions or other patent proceedings. We may need to initiate infringement claims or litigation.

Adverse proceedings such as litigation can be expensive, time consuming and may divert the efforts of our technical and managerial personnel, which could in turn harm our business, whether or not we receive a determination favorable to us. In addition, in an infringement proceeding, a court or other judicial body may decide that the patent we seek to enforce is invalid or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that the patent in question does not cover the technology in question. An adverse result in any litigation could put one or more of our patents at risk of being invalidated or interpreted narrowly. Some of our competitors may be able to devote significantly more resources to intellectual property litigation and may have significantly broader patent portfolios to assert against us if we assert our rights against them. Further, because of the substantial discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be disclosed or otherwise compromised during litigation.

We may not be able to correctly estimate or control our future operating expenses in relation to obtaining intellectual property, enforcing intellectual property and/or defending intellectual property, which could affect operating expenses. Our operating expenses may fluctuate significantly in the future as a result of a variety of factors, including the costs of preparing, filing, prosecuting, defending, and enforcing patent and trademark claims and other intellectual property-related costs, including adverse proceedings (such as litigation) costs.

Our intellectual property agreements with third parties may be subject to disagreements over contract interpretation, which could narrow the scope of our rights to the relevant intellectual property or technology or increase our financial or other obligations to our licensors.

Certain provisions in our intellectual property agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could affect the scope of our rights to the relevant intellectual property or technology, or affect financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

In addition, while it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who in fact conceives or develops intellectual property that we regard as our own. Our assignment agreements may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property.

We may also be subject to claims that former employees, collaborators or other third parties have an ownership interest in our patents or other intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and distraction to management and other employees.

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

Filing, prosecuting and defending patents on drug candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the U.S. can be less extensive than those in the U.S. 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 U.S. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., or from selling or importing products made using our inventions in and into the U.S. or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the U.S. These products may compete with our products 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 certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biopharmaceuticals, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights 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.

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.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented, declared generic or conflict with third-party rights. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition by potential partners or customers in our markets of interest. In addition, third parties may file first for our trademarks in certain countries. If they succeeded in registering such trademarks, and if we were not successful in challenging such third-party rights, we may not be able to use these trademarks to market our products in those countries. In such cases, over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then our marketing abilities may be impacted.

If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected.

We may not be able to protect our proprietary information and technology adequately. Although we use reasonable efforts to protect our proprietary information, technology, and know-how, our employees, consultants, contractors and outside scientific advisors may unintentionally or willfully disclose our information to competitors. Enforcing a claim that a third party illegally obtained and is using any of our proprietary information, technology or know-how is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the U.S. are sometimes less willing to protect proprietary information, technology, and know-how. We rely, in part, on non-disclosure and confidentiality agreements with our employees, consultants and other parties to protect our proprietary information, technology, and know-how. These agreements may be breached and we may not have adequate remedies for any breach. Moreover, others may independently develop similar or equivalent proprietary information, and third parties may otherwise gain access to our proprietary knowledge.

Risks Related to Government Regulation

Even if we obtain regulatory approval for a drug candidate, our products will remain subject to regulatory scrutiny.

If our drug candidates are approved, they will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, conduct of post-marketing studies, and submission of safety, efficacy, and other post-market information, including both federal and state requirements in the U.S. and requirements of comparable foreign regulatory authorities.

Manufacturers and manufacturers' facilities are required to comply with extensive FDA and comparable foreign regulatory authority requirements, including ensuring that quality control and manufacturing procedures conform to cGMP regulations. As such, we and our contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP and adherence to commitments made in any approved marketing application. Accordingly, we and others with whom we work must continue to expend time, money, and effort in all areas of regulatory compliance, including manufacturing, production, and quality control.

We will have to comply with requirements concerning advertising and promotion for our products. Promotional communications with respect to prescription drugs and biologics are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved label. As such, we may not promote our products for indications or uses for which they do not have approval. The holder of an approved application must submit new or supplemental applications and obtain approval for certain changes to the approved product, product labeling, or manufacturing process. We could also be asked to conduct post-marketing clinical studies to verify the safety and efficacy of our products in general or in specific patient subsets. An unsuccessful post-marketing study or failure to complete such a study could result in the withdrawal of marketing approval.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with the promotion, marketing or labeling of a product, such regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If we fail to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may, among other things:

- issue warning letters;
- impose civil or criminal penalties;
- suspend or withdraw regulatory approval;
- suspend any of our clinical studies;
- refuse to approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our contract manufacturers' facilities; or

- seize or detain products or require a product recall.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. Any failure to comply with ongoing regulatory requirements may significantly and adversely affect our ability to commercialize and generate revenue from our products. If regulatory sanctions are applied or if regulatory approval is withdrawn, the value of our company and our operating results will be adversely affected.

Moreover, the policies of the FDA and of other regulatory authorities may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our drug candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the U.S. or abroad. For example, certain policies of the Trump administration may impact our business and industry.

Namely, the Trump administration has taken several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. It is difficult to predict how these orders will be implemented, and the extent to which they will impact the FDA's ability to exercise its regulatory authority. If these executive actions impose restrictions on the FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted. In addition, if we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability.

If any of our small molecule drug candidates obtain regulatory approval, additional competitors could enter the market with generic versions of such drugs, which may result in a material decline in sales of affected products.

Under the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act, a pharmaceutical manufacturer may file an abbreviated new drug application, or ANDA, seeking approval of a generic version of an approved, small molecule innovator product. Under the Hatch-Waxman Act, a manufacturer may also submit a new drug application, or NDA, under section 505(b)(2) of the Federal Food, Drug, and Cosmetic Act that references the FDA's prior approval of the small molecule innovator product. A 505(b)(2) NDA product may be for a new or improved version of the original innovator product. The Hatch-Waxman Act also provides for certain periods of regulatory exclusivity, which preclude FDA approval (or in some circumstances, FDA filing and review) of an ANDA or 505(b)(2) NDA. In addition to the benefits of regulatory exclusivity, an innovator NDA holder may have patents claiming the active ingredient, product formulation or an approved use of the drug, which would be listed with the product in the FDA publication, "Approved Drug Products with Therapeutic Equivalence Evaluations," known as the Orange Book. If there are patents listed in the Orange Book for a product, a generic or 505(b)(2) applicant that seeks to market its product before expiration of the patents must include in their applications what is known as a "Paragraph IV" certification, challenging the validity or enforceability of, or claiming non-infringement of, the listed patent or patents. Notice of the certification must be given to the patent owner and NDA holder and if, within 45 days of receiving notice, either the patent owner or NDA holder sues for patent infringement, approval of the ANDA or 505(b)(2) NDA is stayed for up to 30 months.

Accordingly, if any of our small molecule drug candidates, such as UBX0101 or UBX1967, are approved, competitors could file ANDAs for generic versions of our small molecule drug products or 505(b)(2) NDAs that reference our small molecule drug products. If there are patents listed for our small molecule drug products in the Orange Book, those ANDAs and 505(b)(2) NDAs would be required to include a certification as to each listed patent indicating whether the ANDA applicant does or does not intend to challenge the patent. We cannot predict which, if any, patents in our current portfolio or patents we may obtain in the future will be eligible for listing in the Orange Book, how any generic competitor would address such patents, whether we would sue on any such patents, or the outcome of any such suit.

We may not be successful in securing or maintaining proprietary patent protection for products and technologies we develop or license. Moreover, if any of our owned or in-licensed patents that are listed in the Orange Book are successfully challenged by way of a Paragraph IV certification and subsequent litigation, the affected product could immediately face generic competition and its sales would likely decline rapidly and materially.

Any biologic, or large molecule, drug candidates for which we intend to seek approval may face competition sooner than anticipated.

If we are successful in achieving regulatory approval to commercialize any biologic drug candidate faster than our competitors, such drug candidates may face competition from biosimilar products. In the U.S., large molecule drug candidates are regulated by the FDA as biologic products subject to approval under the biologics license application, or BLA, pathway. The Biologics Price Competition and Innovation Act of 2009, or BPCIA, creates an abbreviated pathway for the approval of biosimilar and interchangeable biologic products following the approval of an original BLA. 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 brand product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product was approved under a BLA. 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.

Moreover, the extent to which a biosimilar product, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biologic products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing. In addition, a competitor could decide to forego the biosimilar approval path and submit a full BLA after completing its own preclinical studies and clinical studies. In such cases, any exclusivity to which we may be eligible under the BPCIA would not prevent the competitor from marketing its product as soon as it is approved.

If competitors are able to obtain marketing approval for biosimilars referencing our large molecule drug candidates, if approved, such products may become subject to competition from such biosimilars, with the attendant competitive pressure and potential adverse consequences. Such competitive products may be able to immediately compete with us in each indication for which our drug candidates may have received approval.

We may seek orphan drug designation for certain future drug candidates, but we may be unable to obtain such designations or to maintain the benefits associated with orphan drug designation, including market exclusivity, which may cause our revenue, if any, to be reduced.

We may pursue orphan drug designation for certain of our future drug candidates. Under the Orphan Drug Act, the FDA may designate a drug or biologic product as an orphan drug if it is intended to treat a rare disease or condition, defined as a patient population of fewer than 200,000 in the U.S., or a patient population greater than 200,000 in the U.S. where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the U.S. In the European Union, the EMA's Committee for Orphan Medicinal Products, or COMP, grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention, or treatment of a life-threatening or chronically debilitating condition affecting not more than five in 10,000 persons in the European Union. Additionally, designation is granted for products intended for the diagnosis, prevention, or treatment of a life-threatening, seriously debilitating or serious and chronic condition when, without incentives, it is unlikely that sales of the drug in the European Union would be sufficient to justify the necessary investment in developing the drug or biological product or where there is no satisfactory method of diagnosis, prevention, or treatment, or, if such a method exists, the medicine must be of significant benefit to those affected by the condition.

In the U.S., orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical study costs, tax advantages, and application fee waivers. In addition, if a product receives the first FDA approval for the indication for which it has orphan designation, the product is entitled to orphan drug exclusivity, which means the FDA may not approve any other application to market the same drug for the same indication for a period of seven years, except in limited circumstances, such as a showing of clinical superiority over the product with orphan exclusivity or where the manufacturer is unable to assure sufficient product quantity for the orphan patient population. 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 following drug or biological 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.

Even if we obtain orphan drug designation, we may not be the first to obtain marketing approval for any particular orphan indication due to the uncertainties associated with developing pharmaceutical products. Further, even if we obtain orphan drug exclusivity for a drug candidate, that exclusivity may not effectively protect the product from competition because different drugs with different active moieties can be approved for the same condition. Even after an orphan drug is approved, the FDA or EMA can subsequently approve the same drug with the same active moiety for the same condition if the FDA or EMA concludes that the later drug is clinically superior in that it is safer, more effective, or makes a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug or biologic nor gives the drug or biologic any advantage in the regulatory review or approval process.

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

In the U.S., the EU and other jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system that could affect our future results of operations. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively the Affordable Care Act, was enacted, which substantially changed the way healthcare is financed by both governmental and private insurers. Among the provisions of the Affordable Care Act, those of greatest importance to the pharmaceutical and biotechnology industries include the following:

- an annual, non-deductible fee payable by any entity that manufactures or imports certain branded prescription drugs and biologic agents (other than those designated as orphan drugs), which is apportioned among these entities according to their market share in certain government healthcare programs;

- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% point-of-sale discounts 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;

- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13.0% of the average manufacturer price for branded and generic drugs, respectively;

- 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;

- extension of a manufacturer’s Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;

- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer’s Medicaid rebate liability;

- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;

- creation of the Independent Payment Advisory Board, which, once empaneled, will have the authority to recommend certain changes to the Medicare program that could result in reduced payments for prescription

drugs and those recommendations could have the effect of law unless overruled by a supermajority vote of Congress; and

- establishment of a Center for Medicare Innovation at the Centers for Medicare & Medicaid Services, or CMS, to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act. For example, the Tax Cuts and Jobs Act of 2017, or the Tax Act, 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". Additionally, on December 14, 2018, a U.S. District Court Judge in Texas ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Act. On December 18, 2019, the U.S. Court of Appeals for the 5th Circuit upheld the district court's decision that the individual mandate was unconstitutional but remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. It is unclear how these decisions, subsequent appeals, if any, and other efforts to challenge, repeal or replace the ACA will impact the law or our business or financial condition.

In addition, other legislative changes have been proposed and adopted in the U.S. since the Affordable Care Act was enacted. In August 2011, the Budget Control Act of 2011, among other things, led to aggregate reductions of Medicare payments to providers of 2% per fiscal year. These reductions went into effect in April 2013 and, due to subsequent legislative amendments to the statute, will remain in effect through 2029 unless additional action is taken by Congress. In January 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, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Individual states in the U.S. have also become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm our business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for our drug candidates or put pressure on our product pricing. Moreover, payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives. For example, CMS may develop new payment and delivery models, such as bundled payment models. In addition, recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products.

In the EU, similar political, economic and regulatory developments may affect our ability to profitably commercialize our drug candidates, if approved. In addition to continuing pressure on prices and cost containment measures, legislative developments at the EU or member state level may result in significant additional requirements or obstacles that may increase our operating costs. The delivery of healthcare in the EU, including the establishment and operation of health services and the pricing and reimbursement of medicines, is almost exclusively a matter for national, rather than EU, law and policy. National governments and health service providers have different priorities and approaches to the delivery of health care and the pricing and reimbursement of products in that context. In general, however, the healthcare budgetary constraints in most EU member states have resulted in restrictions on the pricing and reimbursement of medicines by relevant health service providers. Coupled with ever-increasing EU and national regulatory burdens on those wishing to develop and market products, this could prevent or delay marketing approval of our drug candidates, restrict or regulate post-approval activities and affect our ability to commercialize our drug candidates, if approved. In markets outside of the U.S. and EU, reimbursement and healthcare payment systems vary significantly by country, and many countries have instituted price ceilings on specific products and therapies.

We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action in the U.S., the EU or any other jurisdiction. If we or any third parties we may engage are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we or such third parties are not able to maintain regulatory compliance, our drug candidates may lose any regulatory approval that may have been obtained and we may not achieve or sustain profitability.

Our business operations and current and future relationships with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers will be subject to applicable healthcare regulatory laws, which could expose us to penalties.

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers, may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations. These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute our drug candidates, if approved.

Such laws include:

- the U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or providing any remuneration (including any kickback, bribe, or certain rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, 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 U.S. federal and state healthcare programs such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;

- the U.S. federal false claims and civil monetary penalties laws, including the civil False Claims Act, which, among other things, impose criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the U.S. federal government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government. In addition, the government may assert that a claim including items and services resulting from a violation of the U.S. federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act;

- the U.S. federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services; similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;

- the FDCA, which prohibits, among other things, the adulteration or misbranding of drugs, biologics and medical devices;

- the U.S. Public Health Service Act, which prohibits, among other things, the introduction into interstate commerce of a biological product unless a biologics license is in effect for that product;

- the U.S. Physician Payments Sunshine Act and its implementing regulations, which require certain manufacturers of drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid, or the Children’s Health Insurance Program to report annually to the government information related to certain payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain other healthcare providers starting in 2022, and

teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members;

- analogous U.S. state laws and regulations, including: state anti-kickback and false claims laws, which may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by any third-party payor, including private insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; and state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information, which requires tracking gifts and other remuneration and items of value provided to healthcare professionals and entities; and

- similar healthcare laws and regulations in the EU and other jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers.

Ensuring that our internal operations and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations, agency guidance 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 the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion from government-funded healthcare programs, such as Medicare and Medicaid or similar programs in other countries or jurisdictions, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits and the curtailment or restructuring of our operations. Further, defending against any such actions can be costly, time-consuming and may require significant personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

Changes in and failures to comply with U.S. and foreign privacy and data protection laws, regulations and standards may adversely affect our business, operations and financial performance.

We are subject to or affected by numerous federal, state and foreign laws and regulations, as well as regulatory guidance, governing the collection, use, disclosure, retention, and security of personal data, such as information that we collect about patients and healthcare providers in connection with clinical trials in the United States and abroad. The global data protection landscape is rapidly evolving, and implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future. This evolution may create uncertainty in our business, affect our or any service providers', contractors' or future collaborators' ability to operate in certain jurisdictions or to collect, store, transfer use and share personal information, necessitate the acceptance of more onerous obligations in our contracts, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future. Any failure or perceived failure by us or our collaborators, service providers and contractors to comply with federal, state or foreign laws or regulation, our internal policies and procedures or our contracts governing processing of personal information could result in negative publicity, diversion of management time and effort and proceedings against us by governmental entities or others. In many jurisdictions, enforcement actions and consequences for noncompliance are rising.

In the United States, HIPAA imposes privacy, security and breach reporting obligations with respect to individually identifiable health information upon "covered entities" (health plans, health care clearinghouses and certain health care providers), and their respective business associates, individuals or entities that create, received, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity. HIPAA mandates the reporting of certain breaches of health information to HHS, affected individuals and if the breach is large enough, the media. Entities that are found to be in violation of HIPAA as the result of a breach of unsecured protected health information, a complaint about privacy practices or an audit by HHS, may be subject to significant civil, criminal and administrative fines and penalties and/or additional reporting and oversight obligations if required to enter into a resolution agreement and corrective action plan with HHS to settle allegations of HIPAA non-compliance. Even when HIPAA does not apply, according to the Federal Trade Commission or the FTC, failing to take appropriate steps to keep consumers' personal information secure constitutes unfair acts or practices in or

affecting commerce in violation of Section 5(a) of the Federal Trade Commission Act, or the FTCA, 15 U.S.C § 45(a). The FTC expects a company's data security measures to be reasonable and appropriate in light of the sensitivity and volume of consumer information it holds, the size and complexity of its business, and the cost of available tools to improve security and reduce vulnerabilities. Individually identifiable health information is considered sensitive data that merits stronger safeguards. The FTC's guidance for appropriately securing consumers' personal information is similar to what is required by the HIPAA security regulations, or the HIPAA Security Rule.

In addition, certain state laws govern the privacy and security of health information in certain circumstances, some of which are more stringent than HIPAA and many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. Failure to comply with these laws, where applicable, can result in the imposition of significant civil and/or criminal penalties and private litigation. For example, California enacted the California Consumer Privacy Act, or the CCPA, on June 28, 2018, which went into effect on January 1, 2020. The CCPA gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. The CCPA may increase our compliance costs and potential liability. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the United States, which could increase our potential liability and adversely affect our business.

Our operations abroad may also be subject to increased scrutiny or attention from data protection authorities. Many countries in these regions have established or are in the process of establishing privacy and data security legal frameworks with which we, our collaborators, service providers, including our CRO, and contractors must comply. For example, the EU has adopted the EU General Data Protection Regulation (EU) 2016/679, or GDPR, which went into effect in May 2018 and introduces strict requirements for processing the personal information of EU subjects, including clinical trial data. The GDPR has and will continue to increase compliance burdens on us, including by mandating potentially burdensome documentation requirements and granting certain rights to individuals to control how we collect, use, disclose, retain and process information about them. The processing of sensitive personal data, such as physical health condition, may impose heightened compliance burdens under the GDPR and is a topic of active interest among foreign regulators. In addition, the GDPR provides for more robust regulatory enforcement and fines of up to €20 million or 4% of the annual global revenue of the noncompliant company, whichever is greater. As we expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

Recent U.S. tax legislation and future changes to applicable U.S. tax laws and regulations may have a material adverse effect on our business, financial condition and results of operations.

Changes in laws and policy relating to taxes may have an adverse effect on our business, financial condition and results of operations. For example, the U.S. government recently enacted significant tax reform, and certain provisions of the new law for tax years beginning after December 31, 2017 may adversely affect us. Changes include, but are not limited to, a federal corporate tax rate decrease to 21%, a reduction to the maximum deduction allowed for net operating losses generated in tax years after December 31, 2017, eliminating carrybacks of net operating losses, and providing for indefinite carryforwards for losses generated in tax years after December 31, 2017. The legislation is unclear in many respects and could be subject to potential amendments and technical corrections and will be subject to interpretations and implementing regulations by the Treasury and Internal Revenue Service, any of which could mitigate or increase certain adverse effects of the legislation. In addition, it is unclear how these U.S. federal income tax changes will affect state and local taxation. Generally, future changes in applicable U.S. tax laws and regulations, or their interpretation and application could have an adverse effect on our business, financial conditions and results of operations.

Risks Related to Ownership of Our Common Stock

Our stock price may be volatile and you may not be able to resell shares of our common stock at or above the price you paid.

The trading price of our common stock may be highly volatile and may be subject to wide fluctuations in response to various factors, some of which are beyond our control.

These factors include those discussed in this “Risk Factors” section of this report and others such as:

- results from, and any delays in, commencing, conducting or completing our clinical studies for our lead drug candidates, or any other future clinical development programs;
- announcements by academic or other third parties challenging the fundamental premises underlying our approach to treating age-related diseases and/or drug development;
- announcements of regulatory approval or disapproval of our current or any future drug candidates;
- failure or discontinuation of any of our research and development programs;
- announcements relating to future licensing, collaboration, or development agreements;
- delays in the commercialization of our current or any future drug candidates;
- public misperception regarding the use of our therapies, or public bias of against “anti-aging” companies;
- acquisitions and sales of new products, technologies, or businesses;
- manufacturing and supply issues related to our drug candidates for clinical studies or future drug candidates for commercialization;
- quarterly variations in our results of operations or those of our future competitors;
- changes in earnings estimates or recommendations by securities analysts;
- announcements by us or our competitors of new products, significant contracts, commercial relationships, acquisitions, or capital commitments;
- developments with respect to intellectual property rights;
- our commencement of, or involvement in, litigation;
- changes in financial estimates or guidance, including our ability to meet our future revenue and operating profit or loss estimates or guidance;
- any major changes in our board of directors or management;
- new legislation in the U.S. relating to the sale or pricing of pharmaceuticals;
- FDA or other U.S. or foreign regulatory actions affecting us or our industry;
- product liability claims or other litigation or public concern about the safety of our drug candidates;
- market conditions in the pharmaceutical, biopharmaceutical and biotechnology sectors; and
- general economic conditions in the U.S. and abroad.

In addition, the stock markets in general, and the markets for pharmaceutical, biopharmaceutical, and biotechnology stocks in particular, have experienced extreme volatility that may have been unrelated to the operating performance of the issuer. These broad market fluctuations may adversely affect the trading price or liquidity of our common stock. In the past, when the market price of a stock has been volatile, holders of that stock have sometimes instituted securities class action litigation against the issuer. If any of our stockholders were to bring such a lawsuit against us,

we could incur substantial costs defending the lawsuit and the attention of our management would be diverted from the operation of our business.

An active, liquid and orderly market for our common stock may not develop and may not be maintained.

Prior to our initial public offering in May 2018, there was no public market for shares of our common stock. Although our common stock is listed on the Nasdaq Global Select Market, an active trading market for our common stock may never be sustained on the Nasdaq Global Select or any other exchange in the future. The lack of an active market may impair your ability to sell your shares at the time you wish to sell them or at a price that you consider reasonable. An inactive market may also impair our ability to raise capital by selling shares and may impair our ability to acquire other businesses, applications, or technologies using our shares as consideration.

If securities or industry analysts do not publish research or reports about our business, or if they issue an adverse or misleading opinion regarding our stock, our stock price and trading volume could decline.

The trading market for our common stock is influenced by the research and reports that industry or securities analysts publish about us or our business. In the event any of the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, our intellectual property or our stock performance, or if our clinical studies and operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of us or fail to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

We are an "emerging growth company" and as a result of the reduced disclosure and governance requirements applicable to emerging growth companies, our common stock may be less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act, and we intend to take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. In addition, as an "emerging growth company" the JOBS Act allows us to delay adoption of new or revised accounting pronouncements applicable to public companies until such pronouncements are made applicable to private companies. We have elected to use this extended transition period under the JOBS Act. As a result, our financial statements may not be comparable to the financial statements of issuers who are required to comply with the effective dates for new or revised accounting standards that are applicable to public companies, which may make comparison of our financials to those of other public companies more difficult.

We cannot predict if investors will find our common stock less attractive because we will 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. We may take advantage of these reporting exemptions until we are no longer an emerging growth company. We will remain an emerging growth company until the earlier of (1) the last day of the year following the fifth anniversary of the consummation of our IPO, (2) the last day of the year in which we have total annual gross revenue of at least $1.07 billion, (3) the last day of the year in which we are deemed to be a "large accelerated filer" as defined in Rule 12b-2 under the Exchange Act, which would occur if the market value of our common stock held by non-affiliates exceeded $700.0 million as of the last business day of the second fiscal quarter of such year or (4) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period.

If we sell shares of our common stock in future financings, stockholders may experience immediate dilution and, as a result, our stock price may decline.

We may from time to time issue additional shares of common stock at a discount from the current trading price of our common stock. As a result, our stockholders would experience immediate dilution upon the purchase of any shares of our common stock sold at such discount. In addition, as opportunities present themselves, we may enter into financing or similar arrangements in the future, including the issuance of debt securities, preferred stock or

common stock. For example, on June 3, 2019, we filed a Registration Statement on Form S-3, covering the offering of up to $250 million of shares of common stock, preferred stock, debt securities, warrants and units, and entered into a sales agreement, or Sales Agreement, with Cowen and Company, LLC, or Cowen, to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $75,000,000, through an at-the-market equity offering program under which Cowen will act as our sales agent. As of December 31, 2019, we had sold 3,974,908 shares of common stock under the Sales Agreement for total net proceeds of $26.1 million. If we issue common stock or securities convertible into common stock, our common stockholders would experience additional dilution and, as a result, our stock price may decline.

Our principal stockholders and management own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

As of December 31, 2019, our executive officers, directors, holders of 5% or more of our capital stock and their respective affiliates beneficially owned approximately 61% of our voting stock. Therefore, these stockholders have the ability to influence us through this ownership position. These stockholders may be able to determine all matters requiring stockholder approval. For example, these stockholders may be able to control elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest as one of our stockholders.

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

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. Moreover, holders of approximately 12 million shares of our common stock have rights, subject to certain conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. We have registered and intend to continue to register all shares of common stock that we may issue under our equity compensation plans. Once we register these shares, they can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates.

We incur increased costs as a result of operating as a public company, and our management devote substantial time to new compliance initiatives. We may fail to comply with the rules that apply to public companies, including Section 404 of the Sarbanes-Oxley Act of 2002, which could result in sanctions or other penalties that would harm our business.

We have incurred and will continue to incur significant legal, accounting and other expenses as a public company, including costs resulting from public company reporting obligations under the Exchange Act and regulations regarding corporate governance practices. The listing requirements of the Nasdaq Global Select Market and the rules of the Securities and Exchange Commission, or SEC, require that we satisfy certain corporate governance requirements relating to director independence, filing annual and interim reports, stockholder meetings, approvals and voting, soliciting proxies, conflicts of interest and a code of conduct. Our management and other personnel have devoted and will need to devote a substantial amount of time to ensure that we comply with all of these requirements. Moreover, the reporting requirements, rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costlier. Any changes we make to comply with these obligations may not be sufficient to allow us to satisfy our obligations as a public company on a timely basis, or at all. These reporting requirements, rules and regulations, coupled with the increase in potential litigation exposure associated with being a public company, could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors or board committees or to serve as executive officers, or to obtain certain types of insurance, including directors' and officers' insurance, on acceptable terms.

We are subject to Section 404 of The Sarbanes-Oxley Act of 2002, or Section 404, and the related rules of the SEC, which generally require our management and independent registered public accounting firm to report on the effectiveness of our internal control over financial reporting. Section 404 requires an annual management assessment of the effectiveness of our internal control over financial reporting. However, for so long as we remain

an emerging growth company as defined in the JOBS Act, we intend to take advantage of certain exemptions from various reporting requirements that are applicable to public companies that are not emerging growth companies, including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404. Once we are no longer an emerging growth company or, if prior to such date, we opt to no longer take advantage of the applicable exemption, we will be required to include an opinion from our independent registered public accounting firm on the effectiveness of our internal controls over financial reporting.

During the course of our review of our internal controls we may identify deficiencies in our internal controls that we must remediate. If we identify a material weakness in our internal controls over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. We or our independent registered public accounting firm may not be able to conclude on an ongoing basis that we have effective internal control over financial reporting, which could harm our operating results, cause investors to lose confidence in our reported financial information and cause the trading price of our stock to fall. In addition, as a public company we will be required to file accurate and timely quarterly and annual reports with the SEC under the Exchange Act. In order to report our results of operations and financial statements on an accurate and timely basis, we will depend in part on CROs to provide timely and accurate notice of their costs to us. Any failure to report our financial results on an accurate and timely basis could result in sanctions, lawsuits, delisting of our shares from The Nasdaq Global Select Market or other adverse consequences that would materially harm to our business.

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

We have incurred substantial losses during our history and do not expect to become profitable in the near future, and we may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset a portion of future taxable income, if any, until such unused losses expire, if ever. 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 percentage point change (by value) in its equity ownership by certain stockholders over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards, or NOLs, and other pre-change tax attributes (such as research and development tax credits) to offset its post- change income or taxes may be limited. We may have experienced ownership changes prior to December 31, 2019 and may experience ownership changes in the future as a result of subsequent shifts in our stock ownership (some of which shifts are outside our control). As a result, if we earn net taxable income, our ability to use our pre-change NOLs to offset such taxable income could be subject to limitations. Similar provisions of state tax law may also apply. As a result, even if we attain profitability, we may be unable to use a material portion of our NOLs and other tax attributes. Additionally, the Tax Act, which was enacted on December 22, 2017, significantly reforms the Code, including changes to the rules governing net operating loss carryforwards arising in tax years ending after December 31, 2017. For net operating loss carryforwards, the Tax Act limits a taxpayer's ability to utilize such carryforwards to 80% of taxable income. In addition, net operating loss carryforwards arising in tax years ending after December 31, 2017 can be carried forward indefinitely, but carryback is generally prohibited. Net operating loss carryforwards generated by us before January 1, 2018 will not be subject to the taxable income limitation and will continue to have a twenty- year carryforward period. However, the changes in the carryforward and carryback periods as well as the new limitation on use of net operating losses may significantly impact our ability to use net operating loss carryforwards generated after December 31, 2017, as well as the timing of any such use, and could adversely affect our results of operations.

Provisions in our charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable and may lead to entrenchment of management.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could delay or prevent changes in control or changes in our management without the consent of our board of directors. These provisions include the following:

- a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;

- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;

- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;

- the ability of our board of directors to authorize the issuance of shares of preferred stock and to determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquiror;

- the ability of our board of directors to alter our amended and restated bylaws without obtaining stockholder approval;

- the required approval of at least 66 2/3% of the shares entitled to vote at an election of directors to adopt, amend or repeal our amended and restated bylaws or repeal the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors;

- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;

- the requirement that a special meeting of stockholders may be called only by the chief executive officer or the president or the board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and

- advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of us.

We are also subject to the anti-takeover provisions contained in Section 203 of the Delaware General Corporation Law. Under Section 203, a corporation may not, in general, engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other exceptions, the board of directors has approved the transaction.

Claims for indemnification by our directors and officers may reduce our available funds to satisfy successful third-party claims against us and may reduce the amount of money available to us.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that we will indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law.

In addition, as permitted by Section 145 of the Delaware General Corporation Law, our amended and restated bylaws and our indemnification agreements that we have entered into with our directors and officers provide that:

- We will indemnify our directors and officers for serving us in those capacities or for serving other business enterprises at our request, to the fullest extent permitted by Delaware law. Delaware law provides that a corporation may indemnify such person if 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 registrant and, with respect to any criminal proceeding, had no reasonable cause to believe such person's conduct was unlawful.

- We may, in our discretion, indemnify employees and agents in those circumstances where indemnification is permitted by applicable law.

- We are required to advance expenses, as incurred, to our directors and officers in connection with defending a proceeding, except that such directors or officers shall undertake to repay such advances if it is ultimately determined that such person is not entitled to indemnification. We will not be obligated pursuant to our amended and restated bylaws to indemnify a person with respect to proceedings initiated by that

person against us or our other indemnitees, except with respect to proceedings authorized by our board of directors or brought to enforce a right to indemnification.

- The rights conferred in our amended and restated bylaws are not exclusive, and we are authorized to enter into indemnification agreements with our directors, officers, employees and agents and to obtain insurance to indemnify such persons.

- We may not retroactively amend our amended and restated bylaw provisions to reduce our indemnification obligations to directors, officers, employees and agents.

We do not currently intend to pay dividends on our common stock, and, consequently, your ability to achieve a return on your investment will depend on appreciation in the price of our common stock.

We do not currently intend to pay any cash dividends on our common stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Therefore, you are not likely to receive any dividends on your common stock for the foreseeable future. Since we do not intend to pay dividends, your ability to receive a return on your investment will depend on any future appreciation in the market value of our common stock. There is no guarantee that our common stock will appreciate or even maintain the price at which our holders have purchased it.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Our corporate headquarters are located in South San Francisco, California, where we currently lease approximately 62,000 square feet of office and laboratory space pursuant to a lease dated February 28, 2019. Substantially all our employees work at our corporate headquarters. Our headquarters were previously located in Brisbane, California, where we lease approximately 39,000 square feet of office and laboratory space pursuant to a lease dated May 13, 2016.

Item 3. Legal Proceedings.

We are not currently a party to any material litigation or other material legal proceedings.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information for Common Stock

Our common stock has been listed on The Nasdaq Global Select Market under the symbol "UBX" since May 3, 2018. As of March 1, 2020, there were 69 holders of record of our common stock. Because many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of beneficial owners of our common stock represented by these record holders.

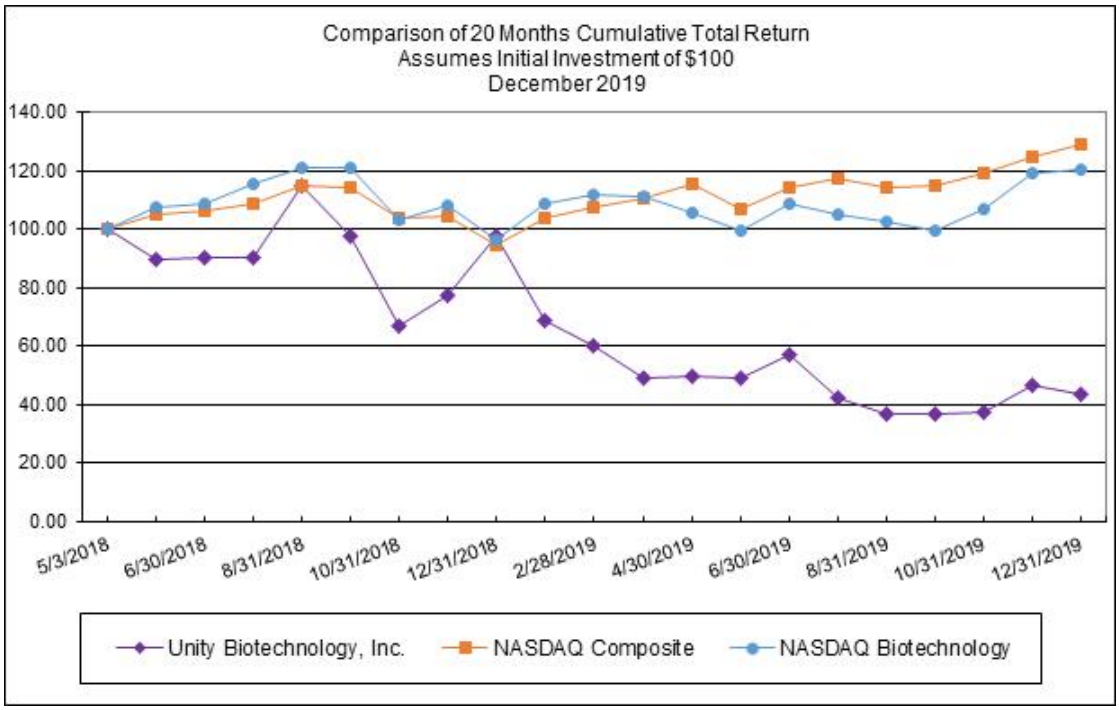
Dividend Policy

We have never declared or paid any cash dividends on our common stock or any other securities. We anticipate that we will retain all available funds and any future earnings, if any, for use in the operation of our business and do not anticipate paying cash dividends in the foreseeable future. In addition, future debt instruments may materially restrict our ability to pay dividends on our common stock. Payment of future cash dividends, if any, will be at the discretion of the board of directors after taking into account various factors, including our financial condition, operating results, current and anticipated cash needs, the requirements of current or then-existing debt instruments and other factors the board of directors deems relevant.

Performance Graph

This graph is not "soliciting material" or deemed "filed" with the SEC for purposes of Section 18 of the Exchange Act, or otherwise subject to liabilities under that Section, and shall not be deemed incorporated by reference into any filing of Unity Biotechnology, Inc. under the Securities Act of 1933, as amended (the "Securities Act"), whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

The following graph compares the cumulative total return on our common stock relative to the cumulative total returns of the Nasdaq Composite Index and the Nasdaq Biotechnology Index. Pursuant to applicable Securities and Exchange Commission rules, all values assume reinvestment of the full amount of all dividends, however no dividends have been declared on our common stock to date. The stockholder returns shown on the graph below are based on historical results and are not necessarily indicative of future performance, and we do not make or endorse any predictions as to future stockholder returns.



Sales of Unregistered Securities

From January 1, 2019 through December 31, 2019 we issued the following unregistered securities:

1. In January 2019, we issued 106,667 shares of our common stock to Ascentage Pharma Group Corp. Limited ("Ascentage") as an upfront license fee payment for rights granted under a license agreement with Ascentage dated January 2, 2019, covering an Ascentange-controlled compound known as UBX1967 (the "UBX1967 License Agreement"). The issuance of such was made in reliance upon exemptions from registration pursuant to Section 4(2) under the Securities Act of 1933, as amended (the "Securities Act"), and Rule 506 promulgated thereunder, and Ascentage represented to us that it is an "accredited investor" within the meaning of Rule 501 under the Securities Act. Accordingly, the shares have not been registered under the Securities Act, and until so registered, these securities may not be offered or sold in the United States absent registration or availability of an applicable exemption from registration. No underwriting discounts or commissions or similar fees were payable in connection with the issuance.

2. In March 2019, we issued 26,667 shares of our common stock the University of Michigan in in satisfaction of Ascentage's obligation to pay a sublicense fee to the University of Michigan in connection with the UBX1967 License Agreement. The issuance of such shares was made in reliance upon exemptions from registration pursuant to Section 4(2) under the Securities Act of 1933, as amended (the "Securities Act"), and Rule 506 promulgated thereunder, and the University of Michigan represented to us that it is an "accredited investor" within the meaning of Rule 501 under the Securities Act. Accordingly, the shares have not been registered under the Securities Act, and until so registered, these securities may not be offered or sold in the United States absent registration or availability of an applicable exemption from registration. No underwriting discounts or commissions or similar fees were payable in connection with the issuance.

3. In June 2019, we issued 120,000 shares of our common stock to a nominee of The Regents of the University of California ("UC Regents") pursuant to a license agreement we entered into with UC Regents on behalf its San Francisco campus, on May 23, 2019. The issuance of such shares was made in reliance upon exemptions from registration pursuant to Section 4(2) under the Securities Act of 1933, as amended (the "Securities Act"), and Rule 506 promulgated thereunder, and UC Regents represented to the Company that it is an "accredited investor" within the meaning of Rule 501 under the Securities Act. Accordingly, the shares have not been registered under the Securities Act, and until so registered, these securities may not be offered or sold in the United States absent registration or availability of an applicable exemption from registration. No underwriting discounts or commissions or similar fees were payable in connection with the issuance.

Use of Proceeds from our Initial Public Offering of Common Stock

On May 2, 2018, the U.S. Securities and Exchange Commission declared effective our registration statement on Form S-1 (File No. 333-224163), as amended, filed in connection with our initial public offering (IPO). There has been no material change in the planned use of proceeds from our IPO from that described in the related prospectus dated May 2, 2018, filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act of 1933, as amended.

Repurchase of Shares or of Company Equity Securities

None.

Item 6. Selected Financial Data.

You should read the following selected historical financial data below together with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our audited financial statements, related notes and other financial information included elsewhere in this report. The selected financial data in this section are not intended to replace the financial statements and are qualified in their entirety by the audited financial statements and related notes included elsewhere in this report.

We derived our selected statements of operations data for the years ended December 31, 2019, 2018 and 2017 and our balance sheet data as of December 31, 2019 and 2018 from our audited financial statements included elsewhere in this report. We derived our selected statements of operations data for the year ended December 31, 2016 and our balance sheet data as of December 31, 2017 and 2016 from our audited financial statements which are not included in this report. Our historical results are not necessarily indicative of the results that may be expected in any future period. The selected financial data below should be read in conjunction with the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and related notes included elsewhere in this report.

	Year Ended December 31,			
	2019	2018	2017	2016
	(in thousands, except share and per share data)			
Statement of Operations Data:				
Contribution revenue	$ —	$ —	$ 1,382	$ —
Operating expenses:				
Research and development	70,957	58,907	37,373	13,707
General and administrative	20,046	16,016	9,617	5,137
Change in fair value of contingent consideration	(1,352)	4,542	—	—
Total operating expenses	89,651	79,465	46,990	18,844
Loss from operations	(89,651)	(79,465)	(45,608)	(18,844)
Loss on extinguishment of promissory notes	—	—	—	(9,377)
Interest income (expense), net	3,289	3,312	1,055	(2,183)
Other income (expense), net	4,185	(245)	(103)	—
Net loss	$ (82,177)	$ (76,398)	$ (44,656)	$ (30,404)
Net loss per share, basic and diluted(1)	$ (1.88)	$ (2.70)	$ (13.97)	$ (11.42)
Weighted average number of shares used in computing net loss per share, basic and diluted(1)	43,624,807	28,269,907	3,197,516	2,662,841

(1) See Note 12 to our audited financial statements for an explanation of the calculations of our basic and diluted net loss per common share and the weighted-average number of common shares used in the computation of the per share amounts.

	As of December 31,			
	2019	2018	2017	2016
	(in thousands)			
Balance Sheet Data:				
Cash and cash equivalents	$ 37,473	$ 15,399	$ 7,298	$ 89,286
Marketable securities	87,533	155,736	84,330	—
Working capital	112,271	156,383	80,983	89,718
Total assets	151,221	181,375	102,024	96,648
Convertible preferred stock	—	—	173,956	131,089
Accumulated deficit	(245,455)	(163,278)	(86,880)	(42,224)
Total stockholders' equity (deficit)	120,707	160,693	(83,113)	(41,536)

Item 7. 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 audited financial statements and related notes included elsewhere in this report. This discussion and other parts of this report contain forward-looking statements that involve risks and uncertainties, such as our plans, objectives, expectations, intentions and beliefs. Our actual results could differ materially from those discussed in these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified below and those discussed in the section entitled "Risk Factors" included elsewhere in this report.

Overview

We are a biotechnology company engaged in researching and developing therapeutics to extend healthspan by slowing, halting or reversing diseases of aging. Our initial focus is on creating senolytic medicines to selectively eliminate senescent cells and thereby treat age-related diseases, such as musculoskeletal, ophthalmologic and pulmonary diseases.

In June 2019, we reported top-line results from our Phase 1 clinical study of UBX0101, our lead product candidate, in patients with moderate-to-severe osteoarthritis, or OA, of the knee. The study demonstrated that UBX0101 was well-tolerated. Dose-dependent improvement in several clinical measures, including pain and function, as well as modulation of multiple senescence-associated secretory phenotype (SASP) factors and disease-related biomarkers, was observed after a single dose of UBX0101.

In the fourth quarter of 2019, we initiated a Phase 2 study of UBX0101 in patients with painful, moderate-to-severe OA of the knee. As of mid-February 2020, this study was fully enrolled and we expect top-line results for 12- and 24-week endpoints in the second half of 2020. The study is randomized, double-blind, and placebo-controlled and will evaluate three doses (0.5 mg, 2.0 mg and 4.0 mg) of UBX0101 administered via a single intra-articular injection. The primary measure is an assessment of pain at 12 weeks using the WOMAC-A instrument. Secondary measures will include safety and tolerability, pain (by NRS) and function (by WOMAC-C) at 12 weeks, as well as these same measures at 24 weeks.

In the first quarter of 2020, we initiated a Phase 1b study of UBX0101 in patients with painful, moderate-to-severe OA of the knee to evaluate the safety, tolerability and initial effectiveness of both a higher dose and repeat doses. We intend to enroll approximately 36 patients and expect top-line results for 12- and 24-week endpoints from the second half of 2020 and the first half of 2021, respectively. This Phase 1b study is randomized, double-blind, and placebo-controlled and will evaluate an 8.0 mg dose of UBX0101 administered via a single intra-articular injection as well as two 4.0 mg doses of UBX0101 administered via intra-articular injection one month apart. The primary measures will be safety and tolerability. Secondary measures will include pain (using the WOMAC-A and NRS instruments) and function (by WOMAC-C) at 12 weeks, as well as similar measures at 24 weeks.

Our lead ophthalmology candidates, UBX1325 and UBX1967, are currently in the final phases of Investigational New Drug, or IND, -enabling non-clinical toxicology studies. Both senolytic molecules are inhibitors of particular members of the Bcl-2 family of apoptosis regulatory proteins which have shown distinct pharmacokinetic profiles in preclinical studies. We intend to complete IND-enabling studies for both molecules prior to selecting the first molecule to advance to a first-in-human study to explore safety and tolerability of this novel mechanism of action for age-related eye diseases. We expect to initiate a Phase 1 safety study for this program in the second half of 2020 and receive initial results from this study in 2021. The overall clinical program is directed at multiple age-related diseases of the eye, such as age-related macular degeneration, diabetic retinopathy and diabetic macular edema.

Since the commencement of our operations, we have invested a significant portion of our efforts and financial resources in research and development activities, and we have incurred net losses each year since inception. Our net losses were $82.2 million and $76.4 million for the years ended December 31, 2019 and 2018, respectively. We do not have any products approved for sale, and we have never generated any revenue from contracts with customers. As of December 31, 2019, we had an accumulated deficit of $245.5 million, and we do not

expect positive cash flows from operations in the foreseeable future. We expect to continue to incur net operating losses for at least the next several years as we continue our research and development efforts, advance our drug candidates through preclinical and clinical development, seek regulatory approval, prepare for and, if approved, proceed to commercialization.

We entered into a lease agreement in February 2019 for our new corporate headquarters, office and laboratory space in South San Francisco, California. The lease agreement, which has an initial term of ten years, commenced in May 2019. Pursuant to the lease agreement, the landlord provided us with a tenant improvement allowance of up to $7.8 million and will finance up to $2.9 million for additional tenant improvements subject to repayment provisions as described in the lease agreement. The value of this tenant improvement allowance of $10.7 million was recorded as a component of deferred rent and leasehold improvements on the balance sheet at December 31, 2019. Our corporate headquarters were formerly located in Brisbane, California, where we lease approximately 39,000 square feet of office and laboratory space pursuant to a lease dated May 13, 2016. We identified and moved into our new office in South San Francisco in 2019 to accommodate our anticipated growth.

Prior to our initial public offering, or IPO, we had funded our operations primarily from the issuance and sale of convertible preferred stock and convertible promissory notes. In May 2018, we completed our IPO pursuant to which we issued 5,000,000 shares of our common stock at a price of $17.00 per share. We received proceeds of approximately $75.9 million, after deducting underwriting discounts, commissions, and offering-related transaction costs from the IPO.

On June 3, 2019, we entered into a sales agreement, or the Sales Agreement, with Cowen and Company, LLC, or Cowen, to sell shares of our common stock, from time to time, with aggregate gross sales proceeds of up to $75.0 million through an at-the-market equity offering program under which Cowen will act as sales agent, or the ATM Offering Program. During the year ended December 31, 2019, we issued and sold 3,974,908 shares of our common stock through the ATM Offering Program and received net proceeds of approximately $26.1 million, after deducting commissions and other offering expenses of $1.4 million.

We do not expect to generate revenue from any drug candidates that we develop until we obtain regulatory approval for one or more of such drug candidates and commercialize our products or enter into collaborative agreements with third parties. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations. As a result, we will need to raise additional capital. If sufficient funds on acceptable terms are not available when needed, we could be required to significantly reduce our operating expenses and delay, reduce the scope of, or eliminate one or more of our development programs.

We rely on third parties in the conduct of our preclinical studies and clinical trials and for manufacturing and supply of our drug candidates. We have no internal manufacturing capabilities, and we will continue to rely on third parties, many of whom are single-source suppliers, for our preclinical and clinical trial materials, as well as the commercial supply of our products. In addition, we do not yet have a marketing or sales organization or commercial infrastructure. Accordingly, we will incur significant expenses to develop a marketing and sales organization and commercial infrastructure in advance of generating any product sales.

Components of Our Results of Operations

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for the development of our drug candidates, which include:

- personnel-related expenses, including salaries, benefits and stock-based compensation for personnel contributing to research and development activities;
- laboratory expenses including supplies and services;
- clinical trial expenses;
- expenses incurred under agreements with third-party contract manufacturing organizations, contract research organizations, research and development service providers, academic research institutions, and consultants;
- expenses related to license and sponsored research agreements; and
- facilities and other allocated expenses, including expenses for rent and facilities maintenance, and depreciation and amortization.

We expect our research and development expenses to increase as we advance our drug candidates into and through preclinical and clinical trials and pursue regulatory approval of our drug candidates. The process of conducting the clinical trials required to obtain regulatory approval is costly and time-consuming. Clinical trials generally become larger and more costly to conduct as they advance into later stages and we are required to make estimates for expense accruals related to clinical trial expenses. The actual probability of success for our drug candidates may be affected by a variety of factors including: the safety and efficacy of our drug candidates, early clinical data, investment in our clinical program, the ability of collaborators, if any, to successfully develop any drug candidates we license to them, competition, manufacturing capability and commercial viability. We may never succeed in achieving regulatory approval for any of our drug candidates. Program costs that are direct external expenses are tracked on a program-by-program basis once they enter clinical studies. As a result of the uncertainties discussed above, we are unable to determine the duration and completion costs of our research and development projects or when and to what extent we will generate revenue from the commercialization and sale of our drug candidates.

General and Administrative Expenses

Our general and administrative expenses consist primarily of personnel costs, allocated facilities costs and other expenses for outside professional services, including legal, audit and accounting services, and depreciation and amortization expense related to property and equipment. Personnel costs consist of salaries, benefits, insurance and stock-based compensation. We expect to continue to incur additional expenses associated with operating as a public company, including expenses related to compliance with the rules and regulations of the Securities and Exchange Commission and standards applicable to companies listed on a national securities exchange, additional insurance expenses, investor relations activities and other administrative and professional services. We also expect to continue to increase the size of our administrative headcount to support the growth of our business and operate as a public company.

Fair Value of Contingent Consideration

Certain of our license agreements include contingent consideration in the form of additional issuances of our common stock based on the achievement of certain milestones. For asset acquisitions, we assess whether such contingent consideration obligation meets the definition of a derivative and/or can be equity classified, until such time that the contingency or equity classification criteria is met or expires. As of December 31, 2019, we have recorded a liability related to contingent consideration as the net settlement criteria of the definition of a derivative had been met and equity classification criteria had not been met. The derivative related to this contingent

consideration is measured at fair value as of each balance sheet date with the related change in fair value being reflected in operating results. Gains or losses on contingent consideration expense is driven by changes in the estimated fair value of the liability, which is determined using a probability-weighted valuation approach model that reflects the probability and timing of future issuances of our common shares.

Interest Income

Interest income is primarily related to interest earned on our marketable securities for the years ended December 31, 2019, 2018 and 2017.

Other Income (Expense)

We hold an equity investment in a Hong-Kong-based clinical-stage biopharmaceutical company called Ascentage Pharma Group International, or Ascentage International. In October 2019, Ascentage International completed an initial public offering of shares of its common stock on the Hong Kong stock exchange. Following the initial public offering, the underlying nature of our investment in Ascentage International changed and met the definition of an investment in an equity security with a readily determinable fair value to be measured at fair value on a recurring basis, based on quoted stock price available on the Hong Kong Stock Exchange. Other income/(expense) includes changes in fair value of the investment in this equity security.

Results of Operations

Comparison of the Years Ended December 31, 2019 and 2018

The following table sets forth the significant components of our results of operations (in thousands):

	Year Ended December 31,		
	2019	2018	Change
Summary of Operations Data:			
Operating expenses:			
Research and development	$ 70,957	$ 58,907	$ 12,050
General and administrative	20,046	16,016	4,030
Change in fair value of contingent consideration	(1,352)	4,542	(5,894)
Total operating expenses	89,651	79,465	10,186
Loss from operations	(89,651)	(79,465)	(10,186)
Interest income (expense), net	3,289	3,312	(23)
Other income (expense), net	4,185	(245)	4,430
Net loss	$ (82,177)	$ (76,398)	$ (5,779)

Research and Development

Research and development expenses increased by $12.1 million, to $71.0 million for the year ended December 31, 2019 from $58.9 million for the year ended December 31, 2018. The increase was primarily due to increases of $2.3 million for personnel-related expenses, which was partially offset by a decrease of $1.1 million related to non-cash stock compensation expense, $6.7 million for outside research and development activities and $3.1 million in lab and facilities-related costs.

General and Administrative

General and administrative expenses increased by $4.0 million, to $20.0 million for the year ended December 31, 2019 from $16.0 million for the year ended December 31, 2018. The increase was primarily due to increases of $3.4 million for personnel-related expenses, of which $2.5 million was related to non-cash stock

compensation expense, and $0.6 million in insurance-related expense partially offset by $0.5 million decrease in professional fees.

Change in fair value of contingent consideration

Change in fair value of contingent consideration reflects a decrease in the contingent consideration liability of $1.4 million for the year ended December 31, 2019. The decrease in the fair value of contingent consideration was primarily due to changes in our stock price.

Interest Income

Our interest income was $3.3 million for the year ended December 31, 2019, as compared to $3.3 million for the year ended December 31, 2018.

Other Income (Expense)

Other income of $4.1 million for the year ended December 31, 2019 was primarily due to a change in the fair value of our investment in the common stock of Ascentage International. In October 2019, Ascentage International completed an initial public offering of shares of its common stock on the Hong Kong stock exchange which caused a change in our underlying investment resulting in it meeting the definition of an equity security with a readily determinable fair value. The increase in the fair value of our investment in Ascentage International was due to changes in the quoted stock price following the initial public offering.

Comparison of the years ended December 31, 2018 and 2017

The following table sets forth the significant components of our results of operations (in thousands):

	Year Ended December 31,		
	2018	2017	Change
Summary of Operations Data:			
Contribution revenue	$ —	$ 1,382	$ (1,382)
Operating expenses:			
Research and development	58,907	37,373	21,534
General and administrative	16,016	9,617	6,399
Change in fair value of contingent consideration	4,542	—	4,542
Total operating expenses	79,465	46,990	32,475
Loss from operations	(79,465)	(45,608)	(33,857)
Interest income	3,312	1,055	2,257
Other expense, net	(245)	(103)	(142)
Net loss	$ (76,398)	$ (44,656)	$ (31,742)

Contribution Revenue

Contribution revenue for the year ended December 31, 2017 was related to funding we recognized from a third-party organization in 2017 for the performance of certain research and development activities in pursuit of that organization’s philanthropic mission.

Research and Development

Research and development expenses increased by $21.5 million, to $58.9 million for the year ended December 31, 2018 from $37.4 million for the year ended December 31, 2017. The increase was primarily due to

increases of $11.3 million for personnel-related expenses, of which $4.3 million was related to non-cash stock-based compensation, $7.8 million for direct research and development activities and $2.4 million for facilities-related costs.

General and Administrative

General and administrative expenses increased by $6.4 million, to $16.0 million for the year ended December 31, 2018 from $9.6 million for the year ended December 31, 2017. The increase was primarily due to increases of $4.8 million for personnel related expenses, of which $2.1 million was related to non-cash stock-based compensation, $1.9 million in professional services expenses primarily related to activities in preparation of becoming a public company, $0.5 million in insurance expense and $0.5 million for facilities-related costs. The increases were partially offset by a $1.3 million in unconditional funding provided to academic institutions.

Change in fair value of contingent consideration

Expenses related to the change in fair value of contingent consideration was $4.5 million for the year ended December 31, 2018. The contingent consideration expense was due to a change in the estimated fair value of the liability under our license agreements as the probability of milestone events requiring settlement through the issuance of shares of our common stock increase. The fair value is determined using a probability-weighted valuation approach model which considers our stock price and the probability and timing of the achievement of certain milestones at the balance sheet date.

Interest Income

Our interest income was $3.3 million for the year ended December 31, 2018, as compared to $1.1 million for the year ended December 31, 2017, as we invested our cash and proceeds from our Series C financing and IPO in marketable securities.

Liquidity, Capital Resources and Capital Requirements

Sources of Liquidity

We have incurred net losses each year since inception. We do not have any products approved for sale and have never generated any revenue from product sales. Historically, we have incurred operating losses as a result of ongoing efforts to develop our drug candidates, including conducting ongoing research and development, preclinical studies and providing general and administrative support for these operations. As of December 31, 2019, we had an accumulated deficit of $245.5 million, and we do not expect positive cash flows from operations in the foreseeable future. We expect our operating losses and net cash used in operating activities will increase over at least the next several years as we continue our research and development activities, advance our drug candidates through preclinical and clinical testing and move into later and more costly stages of drug development, hire personnel and prepare for regulatory submissions and the commercialization of our drug candidates.

We have historically financed our operations primarily through private placements of preferred stock and promissory notes and more recently through our IPO and proceeds from our ATM Offering Program, and will continue to be dependent upon equity and/or debt financing until we are able to generate positive cash flows from our operations.

Prior to our IPO in May 2018, we financed our operations primarily through issuance and sale of convertible preferred stock and convertible promissory notes and we will continue to be dependent upon equity and/or debt financing until we are able to generate positive cash flows from our operations. In March 2018, we sold 3,590,573 shares of Series C convertible preferred stock at $15.3317 per share for proceeds of $54.9 million. In April 2018, we sold 322,852 shares of Series C convertible preferred stock at $15.3317 per share for additional

proceeds of $5.0 million. In May 2018, we consummated our IPO and received net proceeds of $75.9 million, after deducting underwriting discounts, commissions and offering expenses payable by us.

In June 2019, we filed a Registration Statement on Form S-3, or the Shelf Registration Statement, covering the offering of up to $250.0 million of common stock, preferred stock, debt securities, warrants and units. The Shelf Registration Statement included a prospectus covering the offering, issuance and sale of up to $75.0 million of our common stock from time to time through the "ATM Offering Program. The SEC declared the Shelf Registration Statement effective in June 2019. In June 2019, we also entered into a sales agreement, or the Sales Agreement, with Cowen and Company LLC, or Cowen, pursuant to which we may sell from time to time, at our option, up to $75.0 million of our common stock through the ATM Offering Program under which Cowen will act as sales agent. During the year ended December 31, 2019, we issued and sold 3,974,908 shares of our common stock through the ATM Offering Program and received net proceeds of approximately $26.1 million, after deducting commissions and other offering expenses of $1.4 million.

Future Funding Requirements

To date we have not generated any revenue from contracts with customers and have received a contribution from a third-party organization for certain research and development activities to support their philanthropic mission. We expect to continue to incur significant losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our drug candidates, and begin to commercialize any approved products. We are subject to all of the risks typically related to the development of new drug candidates, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. Moreover, following the completion of our IPO, we have begun to incur additional ongoing costs associated with operating as a public company. We anticipate that we will need substantial additional funding in connection with our continuing operations.

Until we can generate a sufficient amount of revenue from the commercialization of our drug candidates or from collaborative agreements with third parties, if ever, we expect to finance our future cash needs through various means. Additional capital may be raised through the sale of our equity securities, incurring debt, entering into licensing or collaboration agreements with partners, receiving research contributions, grants or other sources of financing to fund our operations. There can be no assurance that sufficient funds will be available to us on attractive terms or at all. If we are unable to obtain additional funding from these or other sources, it may be necessary to significantly reduce our rate of spending through reductions in staff and delaying, scaling back, or stopping certain research and development programs. Insufficient liquidity may also require us to relinquish rights to drug candidates at an earlier stage of development or on less favorable terms than we would otherwise choose.

Since our inception, we have incurred significant losses and negative cash flows from operations. We have an accumulated deficit of $245.5 million through December 31, 2019. We expect to incur substantial additional losses in the future as we conduct and expand our research and development activities. We believe that our existing cash, cash equivalents and marketable securities will be sufficient to enable us to fund our projected operations through at least the next 12 months. Based on our current operating plans, we expect our existing capital resources will fund our planned operating expenses into the second half of 2021, including through clinical data readouts from the Phase 2 clinical study of UBX0101 we initiated in the fourth quarter of 2019 and, the higher dose and repeat dose Phase 1b study of UBX0101 we initiated in the first quarter of 2020, as well as initial data from Phase 1 clinical study of one of our lead molecules in age-related eye disease.

We have based our projections of operating capital requirements on assumptions that may prove to be incorrect and we may use all our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated with research, development and commercialization of biotechnology products, we are unable to estimate the exact amount of our operating capital requirements. Our future funding requirements will depend on many factors, including, but not limited to:

- the scope, progress, results and costs of researching and developing UBX0101, UBX132, UBX1967, or any other drug candidates, and conducting preclinical studies and clinical studies, including our ongoing Phase 2 clinical study of UBX0101, which we initiated in the fourth quarter of 2019, the Phase

1b clinical study of UBX0101, which we initiated in the first quarter of 2020, and our planned initial clinical studies in our ophthalmology program;

- the timing of, and the costs involved in, obtaining regulatory approvals for our lead drug candidates or any future drug candidates;
- the number and characteristics of any additional drug candidates we develop or acquire;
- the timing and amount of any milestone payments we are required to make pursuant to our license agreements;
- the cost of manufacturing our lead drug candidates or any future drug candidates and any products we successfully commercialize;
- the cost of building a sales force in anticipation of product commercialization;
- the cost of commercialization activities if our lead drug candidates or any future drug candidates are approved for sale, including marketing, sales and distribution costs;
- our ability to establish and maintain strategic collaborations, licensing or other arrangements and the financial terms of any such agreements, including the timing and amount of any future milestone, royalty or other payments due under any such agreement;
- any product liability or other lawsuits related to our products;
- the expenses needed to attract, hire and retain skilled personnel;
- the costs associated with being a public company;
- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing our intellectual property portfolio; and
- the timing, receipt and amount of sales of any future approved or cleared products, if any.

Cash Flows

The following table sets forth a summary of the primary sources and uses of cash and restricted cash for each of the periods presented below (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Cash used in operating activities	$ (72,421)	$ (56,623)	$ (38,358)
Cash provided by (used in) investing activities	67,953	(72,206)	(86,305)
Cash provided by financing activities	27,438	136,930	42,775
Net increase (decrease) in cash and restricted cash	$ 22,970	$ 8,101	$ (81,888)

Operating Activities

Cash used in operating activities of $72.4 million for the year ended December 31, 2019 consisted primarily of a net loss of $82.2 million adjusted for net non-cash charges of $6.2 million and net changes to our operating assets and liabilities of $3.6 million. Our non-cash charges consisted primarily of $10.9 million in stock-based compensation, $2.7 million in depreciation and amortization and $1.0 million in common stock granted to a third party, partially offset by a $1.4 million change in fair value of contingent consideration, $1.3 million in accretion of our tenant improvement allowance and $1.2 million in net accretion and amortization of premium and discounts on marketable securities. The net change in our operating assets and liabilities consisted of increases of $2.5 million in deferred rent, net of current portion, and $2.1 million in accrued compensation, partially offset by a decreases of $0.6 million in accrued liabilities and other current liabilities, $0.2 million in accounts payable and a $0.2 million increase in prepaid expenses and other current assets.

Cash used in operating activities of $56.6 million for the year ended December 31, 2018 consisted primarily of a net loss of $76.4 million adjusted for net non-cash charges of $14.6 million and net changes to our operating assets and liabilities of $5.1 million. Our non-cash charges consisted primarily of $9.4 million in stock-based compensation, $4.5 million change in fair value of contingent consideration and $2.2 million in depreciation and amortization, partially offset by a $1.0 million in amortization of premium and discounts on marketable securities and $0.6 million in accretion of our tenant improvement allowance. The net change in our operating assets and liabilities consisted of a decrease of $1.4 million in contribution receivable, and increases of $2.2 million in accounts payable, $1.6 million in accrued compensation and $1.4 million in accrued liabilities and other current liabilities, partially offset by a decrease of $0.6 million in other long-term assets and $0.8 million in prepaid expenses and other current assets.

Cash used in operating activities of $38.4 million for the year ended December 31, 2017 consisted primarily of a net loss of $44.7 million, which was partially offset by non-cash charges of $4.0 million and a decrease in our net operating assets of $2.3 million. Our non-cash charges primary consisted of $1.3 million for depreciation and amortization expense and $3.0 million for stock-based compensation expense. The decrease in our net operating assets of $2.3 million was primarily due to an increase in accrued compensation of $1.6 million related to our bonus accrual and increases in accounts payable of $1.2 million and accrued and other current liabilities of $1.3 million as we expand our operations, partially offset by an increase in our contribution receivable of $1.4 million.

Investing Activities

Cash provided by investing activities of $68.0 million for the year ended December 31, 2019 was related to maturities of marketable securities of $188.8 million which were offset by purchases of marketable securities of $119.2 million and purchases of property and equipment of $1.6 million.

Cash used in investing activities of $72.2 million for the year ended December 31, 2018 was related to purchases of marketable securities of $204.1 million, purchases of property and equipment of $1.2 million and the purchase of an investment in stock of $0.5 million, which were offset by maturities of marketable securities of $133.6 million.

Cash used in investing activities of $86.3 million for the year ended December 31, 2017 was related to purchases of marketable securities of $134.5 million and purchases of property and equipment of $1.7 million, which were partially offset by maturities of marketable securities of $49.8 million.

Financing Activities

Cash provided by financing activities of $27.4 million for the year ended December 31, 2019 was related to $26.1 million in proceeds from the sale of common stock through our ATM Offering Program, net of issuance costs, $0.8 million in proceeds from the issuance of common stock under the 2018 Employee Stock Purchase Plan and proceeds from issuance of common stock upon exercise of stock options, net of repurchases, of $0.6 million.

Cash provided by financing activities of $136.9 million for the year ended December 31, 2018 was primarily related to net proceeds from our sale of common stock in our IPO of $75.9 million, net proceeds from issuance of Series C convertible preferred stock of $59.9 million, proceeds from repayment of recourse notes of $0.9 million, and proceeds from issuance of common stock upon exercise of stock options of $0.4 million.

Cash provided by financing activities of $42.8 million for the year ended December 31, 2017 was primarily related to net proceeds from the issuance of shares of our convertible preferred stock.

Contractual Obligations and Other Commitments

Contractual obligations represent future cash commitments and liabilities under agreements with third parties, and exclude contingent liabilities for which we cannot reasonably predict future payment. The following table summarizes our contractual obligations as of December 31, 2019 (in thousands):

	Payments due by period				
	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years	Total
Contractual obligations:					
Operating lease[1]	$ 5,373	$ 12,089	$ 8,926	$ 24,732	$ 51,120
Capital lease	45	—	—	—	45
Total contractual obligations	$ 5,418	$ 12,089	$ 8,926	$ 24,732	$ 51,165

(1) Our contractual obligations and commitments primarily relate to our facilities lease agreements for laboratory and office space. At December 31, 2019, our lease agreements were for approximately 39,000 square feet in Brisbane, California, with the lease period expiring in October 2022 and approximately 63,000 square feet in South San Francisco, California, with the lease period expiring in October 2029.

In February 2019, we entered into a lease agreement for new office and laboratory space in South San Francisco, California. The term of the lease agreement commenced in May 2019. The lease has an initial term of ten years from the commencement date, and we have an option to extend the initial term for an additional eight years at the then market rental rates as determined pursuant to the lease agreement. The total base rent payment escalates annually based on a fixed percentage beginning from the 13th month of the lease agreement. We will also be responsible for the operating expenses and tax expenses allocated to the building, and the operating expenses and tax expenses attributable to the common areas. Pursuant to the lease agreement, the landlord provided us with a tenant improvement allowance of up to $7.8 million and will finance up to $2.9 million for additional tenant improvements subject to repayment provisions as described in the lease agreement.

We are party to various license agreements pursuant to which we have in-licensed rights to various technologies, including patents, research "know-how" and proprietary research tools, for the discovery, research, development and commercialization of drug candidates to treat age-related diseases. The license agreements obligate us to make certain milestone payments related to specified clinical development and sales milestone events, as well as tiered royalties in the low-single digits based on sales of licensed products. The table above does not include any milestone payments or royalty payments to third parties as the amounts, timing and likelihood of such payments are not known. See Note 5 to our financial statements "License Agreements" for additional information.

Indemnification

In the normal course of business, we enter into contracts and agreements that contain a variety of representations and warranties and provide for general indemnifications. Our exposure under these agreements is unknown because it involves claims that may be made against us in the future but have not yet been made. To date, we have not paid any claims or been required to defend any action related to our indemnification obligations. However, we may record charges in the future as a result of these indemnification obligations.

In accordance with our certificate of incorporation and bylaws, we have potential indemnification obligations to our officers and directors for specified events or occurrences, subject to some limits, while they are serving at our request in such capacities. There have been no claims to date, and we have director and officer insurance that may enable us to recover a portion of any amounts paid for future potential claims.

Off-Balance Sheet Arrangements

We have not entered into any off-balance sheet arrangements. While we have an investment in a variable interest entity, its purpose is not to provide off-balance sheet financing.

Critical Accounting Polices and Estimates

This discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP"). The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported expenses incurred during the reporting periods. These items are monitored and analyzed by us for changes in facts and circumstances, and material changes in these estimates could occur in the future. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Changes in estimates are reflected in reported results for the period in which they become known. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in the notes to our financial statements included elsewhere in this prospectus, we believe that the following accounting policies are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

Research and Development Expenses and Accruals

Costs related to research and development of drug candidates are charged to research and development expense as incurred. Research and development costs include, but are not limited to, payroll and personnel expenses for personnel contributing to research and development activities, laboratory supplies, outside services, licenses acquired to be used in research and development, manufacturing of clinical material, pre-clinical testing and consultants and allocated overhead, including rent, equipment, depreciation and utilities. Research and development costs are expensed as incurred unless there is an alternative future use in other research and development projects. Payments made prior to the receipt of goods or services to be used in research and development are deferred and recognized as expense in the period in which the related goods are received or services are rendered. Such payments are evaluated for current or long-term classification based on when they will be realized.

As part of the process of preparing our financial statements, we are required to estimate expenses resulting from our obligations under contracts with vendors and consultants and clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided under such contracts. Our objective is to reflect the appropriate expenses in our financial statements by matching those expenses with the period in which services and efforts are expended. We account for these expenses according to the progress of the production of clinical trial materials or based on progression of the clinical trial, as measured by patient progression and the timing of various aspects of the trial. We determine accrual estimates by taking into account discussion with applicable personnel and outside service providers as to the progress or state of consummation of goods and services, or the services completed. During the course of a clinical trial, we adjust the rate of expense recognition if actual results differ from our estimates. We make estimates of accrued expenses as of each balance sheet date in our financial statements based on the facts and circumstances known at that time. Our clinical trial accrual is dependent in part upon the timely and accurate reporting of contract research organizations, contract manufacturers and other third-party vendors. 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 our reporting changes in estimates in any particular period. Adjustments to prior period estimates have not been material for the years ended December 31, 2019 and 2018.

We have and may continue to enter into license agreements to access and utilize certain technology. We evaluate if the license agreement is an acquisition of an asset or a business. To date none of our license agreements have been considered to be an acquisition of a business. For asset acquisitions, the upfront payments to acquire such licenses, as well as any future milestone payments made before product approval, are immediately recognized as research and development expense when due, provided there is no alternative future use of the rights in other research and development projects. These license agreements may also include contingent consideration in the form of cash and additional issuances of our common stock.

Contingent Consideration Liability

We have entered into license agreements to access and utilize certain intellectual property and technology and may enter into additional license agreements in the future. In each case, we evaluate if the license agreement results in the acquisition of an asset or a business. To date, none of our license agreements have been considered an acquisition of a business. If a license agreement is deemed to constitute an asset acquisition, the upfront payments to acquire such licenses, as well as any future milestone payments made before product approval, are immediately recognized as research and development expense when due, provided there is no alternative future use of the rights in other research and development projects. Several of our license agreements also include contingent consideration in the form of an obligation to issue additional shares of our common stock if we achieve certain milestones. For contingent consideration related to our asset acquisitions, we assess on a continuous basis whether the contingent consideration meets the definition of a derivative and/or whether it can be classified within stockholders' equity, until such time that equity classification criteria are met or the milestones expire. The derivative related to the contingent consideration arising from our license agreements is measured at fair value as of each balance sheet date with the related change in fair value being reflected in operating expenses. Upon a reassessment event that results in the contingent consideration no longer meeting the definition of a derivative and/or meeting equity classification criteria, the final change in fair value of the instrument is recorded within operating expenses and the liability is reclassified into stockholders' equity.

We value the contingent consideration liability using a probability-weighted valuation approach model that reflects the probability and timing of achieving the milestones which trigger the obligation to issue additional shares of common stock. The probability of achieving the defined milestones for each licensed product is estimated on a quarterly basis by our management team. The total contingent consideration may change significantly over time as preclinical and/or clinical development progresses and additional data is obtained, impacting our assumptions regarding the probability of successfully achieving the relevant milestones and the time frame in which they are expected to be achieved. For example, significant increases in the estimated probability of achieving a milestone would result in a significantly higher fair value measurement, while significant decreases in the estimated probability of achieving a milestone would result in a significantly lower fair value measurement. Judgment is employed in determining these assumptions at each subsequent period. Updates to assumptions could have a significant impact on our results of operations in any given period. Actual results may differ from estimates.

We believe the fair values used to record contingent consideration liability are based upon reasonable estimates and assumptions given the facts and circumstances as of the related valuation dates.

Stock-Based Compensation

We recognize compensation costs related to stock-based awards granted to employees and nonemployees based on the estimated fair value of the awards on the date of grant, and we recognize forfeitures as they occur. For awards that vest solely based on service conditions or a combination of service and performance conditions, we estimate the grant date fair value, and the resulting stock-based compensation expense, using the Black-Scholes option-pricing model. The grant date fair value of the awards is generally recognized on a straight-line basis over the requisite service period, which is typically their vesting period. Forfeitures are recognized as they occur.

Prior to our IPO, the fair value of our shares of common stock underlying the stock options was the responsibility of and determined by our Board. Because there was no public market for our common stock, the Board determined the fair value of common stock at the time of grant of the option by considering a number of objective and subjective factors, including, among others: the prices at which we sold shares of our convertible preferred stock to outside investors in arms-length transactions; the rights, preferences and privileges of our convertible preferred stock relative to those of our common stock; our results of operations, financial position and capital resources; current business conditions and projections; the lack of marketability of our common stock; the hiring of key personnel and the experience of management; progress of our research and development activities; our stage of development and material risks related to its business; the fact that the stock option grants involve illiquid securities in a private company; and the likelihood of achieving a liquidity event, such as an initial public offering or sale, in light of prevailing market conditions.

Following the IPO, the market traded price of the shares of common stock underlying the stock-based awards is the fair value of our stock as reported on The Nasdaq Global Select Market on the grant date.

The Black-Scholes option-pricing model requires the use of highly subjective assumptions to determine the fair value of stock-based awards. These assumptions include:

- Expected term—The expected term represents the period that the stock-based awards are expected to be outstanding. We use, due to insufficient historical data, the simplified method to determine the expected term, which is based on the average of the time-to-vesting and the contractual life of the options.
- Expected volatility—Due to our limited trading history for our common stock, the expected volatility is estimated based on the average historical volatilities of common stock of comparable publicly traded entities over a period equal to the expected term of the stock option grants. The comparable companies are chosen based on their size, stage in the product development cycle or area of specialty. We will continue to apply this process until a sufficient amount of historical information regarding the volatility of our own stock price becomes available.
- Risk-free interest rate—The risk-free interest rate is based on the U.S. Treasury yield in effect at the time of grant for zero-coupon U.S. Treasury notes with maturities approximately equal to the expected term of the awards.
- Expected dividend—We have never paid dividends on our common stock and have no plans to pay dividends on our common stock. Therefore, we used an expected dividend yield of zero.

For stock options granted to non-employee consultants, the fair value of these options is also remeasured using the Black-Scholes option-pricing model reflecting consistent assumptions as applied to employee options in each of the reported periods, other than the expected term, which is assumed to be the remaining contractual life of the option.

We have also granted stock options to certain key employees that vest in conjunction with certain performance and market conditions. We estimate the fair value of these awards using a lattice model, taking into consideration the market conditions. No expense will be recorded related to these awards until the achievement of the performance condition becomes probable. Once the achievement of the performance condition becomes probable, expense related to these awards is recognized using the accelerated attribution method with a cumulative catch-up adjustment over the derived service period relating to the market conditions, if the market conditions have not been met. As these awards vest in their entirety upon achievement of the market conditions, any unrecognized expense would be accelerated if the market conditions are achieved prior to the completion of the derived service period.

We will continue to use judgment in evaluating the expected volatility, expected terms and forfeiture rates utilized for our stock-based compensation expense calculations on a prospective basis. In addition to the Black-Scholes assumptions, we estimate our forfeiture rate based on an analysis of our actual forfeitures and we will continue to evaluate the adequacy of the forfeiture rate based on actual forfeiture experience, analysis of employee turnover behavior and other factors. The impact from any forfeiture rate adjustment would be recognized in full in the period of adjustment, and if the actual number of future forfeitures differs from our estimates, we might be required to record adjustments to stock-based compensation in future periods.

As of December 31, 2019, we had $28.1 million of unrecognized compensation expense related to unvested stock options and restricted stock units, which is expected to be recognized over an estimated weighted-average period of 3.5 years. For stock-based awards subject to ratable vesting, we recognize compensation cost on a straight-line basis over the service period for the entire award. In future periods, our stock-based compensation expense is expected to increase as a result of recognizing our existing unrecognized stock-based compensation for awards that will vest and as we issue additional stock-based awards to attract and retain our employees.

JOBS Act Accounting Election

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 have elected to use this extended transition period to enable us to comply with new or revised accounting standards that have different effective dates for public and private companies until the earlier of the date we (i) are no longer an emerging growth company or (ii) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, our financial statements may not be comparable to companies that comply with new or revised accounting pronouncements as of public company effective dates.

Recent Accounting Pronouncements

See Note 2 to our Financial Statements "Summary of Significant Accounting Policies" for information.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

We are exposed to market risks in the ordinary course of our business. These risks primarily relate to interest rate sensitivities. We had cash, cash equivalents and marketable securities of $125.0 million as of December 31, 2019, which consist of bank deposits, money market funds, and marketable securities. The primary objective of our investment activities is to preserve capital to fund our operations. We also seek to maximize income from our investments without assuming significant risk. Because our investments are primarily short-term in duration, we believe that our exposure to interest rate risk is not significant, and a 1% movement in market interest rates would not have a significant impact on the total value of our portfolio. We had no debt outstanding as of December 31, 2019.

Item 8. Financial Statements and Supplementary Data.

UNITY BIOTECHNOLOGY, INC.
Index to Financial Statements

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of
Unity Biotechnology, Inc.

Opinion on the Financial Statements

We have audited the accompanying balance sheets of Unity Biotechnology, Inc. (the Company) as of December 31, 2019 and 2018, and related statements of operations and comprehensive loss, convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's 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 audits in accordance with the standards of the PCAOB. 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. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits 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 include 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/ Ernst & Young LLP

We have served as the Company's auditor since 2017.

Redwood City, California
March 11, 2020

UNITY BIOTECHNOLOGY, INC.
Balance Sheets
(in thousands, except for share amounts and par value)

	December 31,	
	2019	2018
Assets		
Current assets:		
Cash and cash equivalents	$ 37,473	$ 15,399
Short-term marketable securities	84,508	155,736
Strategic investments	5,507	—
Prepaid expenses and other current assets	1,999	1,830
Total current assets	129,487	172,965
Property and equipment, net	16,636	6,238
Long-term marketable securities	3,025	—
Restricted cash	1,446	550
Other long-term assets	627	1,622
Total assets	$ 151,221	$ 181,375
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 5,185	$ 4,847
Accrued compensation	5,905	3,791
Accrued and other current liabilities	4,995	4,990
Settlement liability	—	2,059
Contingent consideration liability	1,131	895
Total current liabilities	17,216	16,582
Deferred rent, net of current portion	13,298	2,467
Contingent consideration liability, net of current portion	—	1,588
Other non-current liabilities	—	45
Total liabilities	30,514	20,682
Commitments and contingencies (Note 7)		
Convertible preferred stock, $0.0001 par value; 10,000,000 shares authorized; no shares issued and outstanding	—	—
Stockholders' equity (deficit):		
Common stock, $0.0001 par value; 300,000,000 shares authorized as of December 31, 2019 and 2018; 47,227,065 and 42,414,294 shares issued and outstanding as of December 31, 2019 and 2018, respectively	5	4
Additional paid-in capital	366,695	324,663
Related party promissory notes for purchase of common stock	(210)	(201)
Employee promissory notes for purchase of common stock	(418)	(400)
Accumulated other comprehensive loss	90	(95)
Accumulated deficit	(245,455)	(163,278)
Total stockholders' equity	120,707	160,693
Total liabilities and stockholders' equity	$ 151,221	$ 181,375

See accompanying notes to the financial statements.

UNITY BIOTECHNOLOGY, INC.
Statements of Operations and Comprehensive Loss
(in thousands, except share and per share amounts)

	Year ended December 31,		
	2019	2018	2017
Contribution revenue	$ —	$ —	$ 1,382
Operating expenses:			
Research and development	70,957	58,907	37,373
General and administrative	20,046	16,016	9,617
Change in fair value of contingent consideration	(1,352)	4,542	—
Total operating expenses	89,651	79,465	46,990
Loss from operations	(89,651)	(79,465)	(45,608)
Interest income	3,289	3,312	1,055
Other income (expense), net	4,185	(245)	(103)
Net loss	$ (82,177)	$ (76,398)	$ (44,656)
Other comprehensive loss			
Unrealized gain (loss) on marketable debt securities, net of tax	185	9	(104)
Comprehensive loss	$ (81,992)	$ (76,389)	$ (44,760)
Net loss per share, basic and diluted	$ (1.88)	$ (2.70)	$ (13.97)
Weighted average number of shares used in computing net loss per share, basic and diluted	43,624,807	28,269,907	3,197,516

See accompanying notes to the financial statements.

UNITY BIOTECHNOLOGY, INC.
Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(in thousands, except share amounts)

	Convertible Preferred Stock		Common Stock		Additional Paid-In	Related Party Promissory Notes for Purchase of	Employee Promissory Notes for Purchase of	Accumulated Other Comprehensive	Accumulated	Total Stockholders'
	Shares	Amount	Shares	Amount	Capital	Common Stock	Common Stock	Loss	Deficit	Equity (Deficit)
Balances at December 31, 2016	**24,620,615**	**$ 131,089**	**4,303,538**	**$ 1**	**$ 889**	**$ (202)**	**$ —**	**$ —**	**$ (42,224)**	**$ (41,536)**
Issuance of Series B convertible preferred stock at $12.125 per share for cash, net of issuance costs of $43	3,539,109	42,867	—	—	—	—	—	—	—	—
Issuance of common stock upon exercise of stock options, net of amount related to early exercised options of $5	—	—	43,727	—	8	—	—	—	—	8
Vesting of early exercised options	—	—	—	—	97	—	—	—	—	97
Issuance of restricted stock	—	—	625,931	—	—	—	—	—	—	—
Common stock granted to third party	—	—	12,711	—	44	—	—	—	—	44
Stock-based compensation	—	—	—	—	3,034	—	—	—	—	3,034
Unrealized loss on marketable securities, net of tax	—	—	—	—	—	—	—	(104)	—	(104)
Repurchase of early exercised shares of common stock	—	—	(155,518)	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	—	(44,656)	(44,656)
Balances at December 31, 2017	**28,159,724**	**$ 173,956**	**4,830,389**	**$ 1**	**$ 4,072**	**$ (202)**	**$ —**	**$ (104)**	**$ (86,880)**	**$ (83,113)**
Issuance of Series C convertible preferred stock at $15.3317 per share for cash, net of issuance costs of $119	3,913,425	59,881	—	—	—	—	—	—	—	—
Issuance of common stock upon initial public offering, net of issuance costs of $9,149	—	—	5,000,000	1	75,851	—	—	—	—	75,852
Conversion of Series A-1, A-2, B and C convertible preferred stock to common stock	(32,073,149)	(233,837)	32,073,149	2	233,837	—	—	—	—	233,839
Issuance of common stock upon exercise of warrants and stock options, net of amount related to early exercised options of $1,212	—	—	510,756	—	374	—	—	—	—	374
Vesting of early exercised stock options	—	—	—	—	584	—	—	—	—	584
Stock-based compensation	—	—	—	—	9,441	—	—	—	—	9,441
Change in unrealized gain (loss) on available-for-sale marketable securities, net of tax	—	—	—	—	—	—	—	9	—	9
Receipt of promissory note from related party for purchase of common stock	—	—	—	—	—	(390)	—	—	—	(390)
Receipt of promissory note from employee for purchase of common stock	—	—	—	—	—	—	(400)	—	—	(400)
Repayment of promissory note from related party	—	—	—	—	504	391	—	—	—	895
Net loss	—	—	—	—	—	—	—	—	(76,398)	(76,398)
Balances at December 31, 2018	**—**	**$ —**	**42,414,294**	**$ 4**	**$ 324,663**	**$ (201)**	**$ (400)**	**$ (95)**	**$ (163,278)**	**$ 160,693**
Issuance of common stock, net of issuance costs, under at-the-market ("ATM") equity offering program	—	—	3,974,908	1	26,085	—	—	—	—	26,086
Issuance of common stock upon exercise of stock options	—	—	505,226	—	840	—	—	—	—	840
Vesting of early exercised stock options	—	—	—	—	647	—	—	—	—	647
Stock-based compensation	—	—	—	—	10,852	—	—	—	—	10,852
Common stock issued to third parties	—	—	253,334	—	3,022	(9)	(18)	—	—	2,995
Repurchased shares	—	—	(4,281)	—	—	—	—	—	—	—
Issuance of common stock under employee stock purchase plan ("ESPP")	—	—	83,584	—	586	—	—	—	—	586
Change in unrealized gain (loss) on available-for-sale marketable securities, net of tax	—	—	—	—	—	—	—	185	—	185
Net loss	—	—	—	—	—	—	—	—	(82,177)	(82,177)
Balances at December 31, 2019	**—**	**$ —**	**47,227,065**	**$ 5**	**$ 366,695**	**$ (210)**	**$ (418)**	**$ 90**	**$ (245,455)**	**$ 120,707**

See accompanying notes to the financial statements.

UNITY BIOTECHNOLOGY, INC.
Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2019	2018	2017
Operating activities			
Net loss	$ (82,177)	$ (76,398)	$ (44,656)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	2,663	2,180	1,304
Net accretion and amortization of premium and discounts on marketable securities	(1,151)	(955)	182
Stock-based compensation	10,852	9,441	3,034
Loss on disposal of property and equipment	—	45	15
Common stock granted to third party	965	—	44
Change in fair value of strategic investments	(4,507)	—	—
Accretion of tenant improvement allowance	(1,275)	(605)	(605)
Change in fair value of contingent consideration for license agreements	(1,352)	4,542	—
Changes in operating assets and liabilities:			
Contribution receivable	—	1,382	(1,382)
Prepaid expenses and other current assets	(169)	(842)	(746)
Other long-term assets	(31)	(604)	23
Accounts payable	(227)	2,228	1,198
Accrued compensation	2,114	1,610	1,607
Accrued liabilities and other current liabilities	(587)	1,446	1,258
Deferred rent, net of current portion	2,461	(93)	366
Net cash used in operating activities	(72,421)	(56,623)	(38,358)
Investing activities			
Purchase of marketable securities	(119,270)	(204,086)	(134,465)
Maturities of marketable securities	188,809	133,644	49,849
Purchase of investment in stock	—	(500)	—
Purchase of property and equipment	(1,586)	(1,264)	(1,689)
Net cash provided by (used in) investing activities	67,953	(72,206)	(86,305)
Financing activities			
Proceeds from issuance of common stock under ATM offering program, net of issuance costs	26,085	—	—
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	59,881	42,867
Proceeds from issuance of common stock upon exercise of stock options, net of repurchases	840	374	(37)
Proceeds from issuance of common stock under ESPP	586	—	—
Proceeds from initial public offering, net of issuance costs	—	79,055	—
Payment of initial public offering costs	—	(3,201)	—
Proceeds from repayment of recourse notes	—	895	—
Payments made on capital lease obligations	(73)	(74)	(55)
Net cash provided by financing activities	27,438	136,930	42,775
Net increase (decrease) in cash, cash equivalents and restricted cash	22,970	8,101	(81,888)
Cash, cash equivalents and restricted cash at beginning of year	15,949	7,848	89,736
Cash, cash equivalents and restricted cash at end of year	$ 38,919	$ 15,949	$ 7,848
Supplemental Disclosures of Non-Cash Investing and Financing Activities			
Property and equipment included in accounts payable	$ 565	$ 241	$ 314
Property and equipment acquired under capital leases	$ —	$ —	$ 243
Lessor funded lease incentives included in property and equipment	$ 10,651	$ —	$ 3,881
Receipt of promissory note for purchase of common stock	$ —	$ 400	$ —
Receipt of promissory note from related party for purchase of common stock	$ 27	$ 390	$ —

See accompanying notes to the financial statements.

1. Organization

Description of Business

Unity Biotechnology, Inc. (the "Company") is a biotechnology company engaged in the research and development of therapeutics to extend human healthspan. The Company devotes substantially all of its time and efforts to performing research and development, raising capital and recruiting personnel. The Company's headquarters are located in South San Francisco, California and was incorporated in the State of Delaware in 2009.

Need for Additional Capital

The Company has incurred operating losses and has an accumulated deficit as a result of ongoing efforts to develop drug product candidates, including conducting preclinical and clinical trials and providing general and administrative support for these operations. The Company had an accumulated deficit of $245.5 million as of December 31, 2019. During the year ended December 31, 2019, the Company incurred a net loss of $82.2 million and used $72.4 million of cash in operating activities. To date, none of the Company's drug candidates have been approved for sale. The Company has not generated any revenue from contracts with customers and does not expect positive cash flows from operations in the foreseeable future. The Company has financed its operations primarily through private placements of preferred stock and promissory notes and more recently through our IPO and proceeds from our ATM Offering Program, and will continue to be dependent upon equity and/or debt financing until we are able to generate positive cash flows from our operations. To date, none of the Company's drug candidates have been approved for sale and therefore the Company has not generated any revenue from contracts with customers.

The Company had cash, cash equivalents and marketable securities of $125.0 million as of December 31, 2019. The Company has evaluated and concluded there are no conditions or events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern for a period of 12 months following the date that these financial statements are issued. Management expects operating losses to continue for the foreseeable future. As a result, the Company will need to raise additional capital. If sufficient funds on acceptable terms are not available when needed, the Company could be required to significantly reduce its operating expenses and delay, reduce the scope of, or eliminate one or more of its development programs. Failure to manage discretionary spending or raise additional financing, as needed, may adversely impact the Company's ability to achieve its intended business objectives.

Reverse Stock Split

On April 19, 2018, the Company's board of directors approved an amendment to the Company's amended and restated certificate of incorporation to effect a 1-for-2.95 reverse split ("Reverse Split") of shares of the Company's common and convertible preferred stock, which was effected on April 20, 2018. The par value and authorized shares of common stock and convertible preferred stock were not adjusted as a result of the Reverse Split. All of the share and per share information included in the accompanying financial statements has been adjusted to reflect the Reverse Split.

2. Summary of Significant Accounting Policies

Basis of Presentation

These financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP") and the rules and regulations of Securities and Exchange Commission ("SEC") for reporting.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. The Company bases its estimates on historical experience and market-specific or other relevant assumptions that it believes are reasonable under the circumstances. The amounts of assets and liabilities reported in the Company's balance sheets and the amount of expenses and income reported for each of the periods presented are affected by estimates and assumptions, which are used for, but are not limited to, determining the fair value of assets and liabilities, contingent consideration liability, common stock valuation, and stock-based compensation. Actual results could differ from such estimates or assumptions.

Segments

The Company has one operating segment. The Company's chief operating decision maker, its Chief Executive Officer, manages the Company's operations on a consolidated basis for the purposes of allocating resources.

Cash, Cash Equivalents and Restricted Cash

The Company considers all highly liquid investments with original maturities of 90 days or less from the date of purchase to be cash equivalents. Cash equivalents primarily include money market funds that invest in U.S. Treasury obligations which are stated at fair value.

The Company has issued letters of credit under its lease agreements which have been collateralized. This cash is classified as noncurrent restricted cash on the balance sheet based on the term of the underlying lease.

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within the balance sheets that sum to the total of the same amounts shown in the statements of cash flows (in thousands).

	December 31,		
	2019	2018	2017
Cash and cash equivalents	$ 37,473	$ 15,399	$ 7,298
Restricted cash	1,446	550	550
Total cash, cash equivalents, and restricted cash	$ 38,919	$ 15,949	$ 7,848

Marketable Securities

The Company generally invests its excess cash in investment grade, short to intermediate-term, fixed income securities. Such investments are considered available-for-sale debt securities, and reported at fair value with unrealized gains and losses included as a component of stockholders' deficit. Marketable securities with original maturities of greater than 90 days from the date of purchase but less than one year from the balance sheet date that are available to be converted into cash to fund current operations are classified as short-term, while marketable securities with maturities in one year or beyond one year from the balance sheet date are classified as long-term. The amortized cost of debt securities is adjusted for amortization of premiums and accretion of discounts to maturity, which is included in interest income on the statements of operations and comprehensive loss. Realized gains and losses and declines in value judged to be other-than-temporary, if any, on marketable securities are included in interest income (expense), net. The cost of securities sold is determined using the specific identification method.

The Company periodically evaluates whether declines in fair values of its marketable securities below their book value are other-than-temporary. This evaluation consists of several qualitative and quantitative factors regarding the severity and duration of the unrealized loss as well as the Company's ability and intent to hold the marketable security until a forecasted recovery occurs. Additionally, the Company assesses whether it has plans to sell the security or it is more likely than not it will be required to sell any marketable securities before recovery of its amortized cost basis. Factors considered include quoted market prices, recent financial results and operating trends, implied values from any recent transactions or offers of investee securities, credit quality of debt instrument issuers,

other publicly available information that may affect the value of the marketable security, duration and severity of the decline in value, and management's strategy and intentions for holding the marketable security. To date, the Company has not recorded any impairment charges on its marketable securities related to other-than-temporary declines in market value.

Strategic Investments

The Company may make investments in strategic partners. The Company does not intend to have a controlling interest or significant influence when it makes these strategic investments. Investments in equity securities of strategic partners with readily determinable fair values are measured using quoted market prices in with changes recorded through other income (expense), net in the statement of operations. The Company currently holds a non-controlling equity investment in the common stock of a Hong-Kong based clinical-stage biopharmaceutical company called Ascentage Pharma Group International ("Ascentage International"), which was acquired in connection with certain license agreements (see Note 5, "License Agreements"). In October 2019, Ascentage International completed an initial public offering of shares of its common stock on the Hong Kong stock exchange at HK$34.20 (approximately USD $4.36) per share. The Company is subject to a lock-up agreement with Ascentage International that precludes the Company from selling shares prior to April 2020.

Fair Value Measurements

The Company's financial instruments during the periods presented consist of cash and cash equivalents, restricted cash, marketable securities, strategic investments, prepaid expenses and other current assets, accounts payable, accrued compensation, accrued and other current liabilities and contingent consideration liabilities. Fair value estimates of these instruments are made at a specific point in time, based on relevant market information. These estimates may be subjective in nature and involve uncertainties and matters of judgment.

Concentrations of Risk

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist primarily of cash, cash equivalents, restricted cash and marketable securities. Substantially all of the Company's cash and cash equivalents and restricted cash is deposited in accounts with financial institutions that management believes are of high credit quality. Such deposits have and will continue to exceed federally insured limits. The Company maintains its cash with accredited financial institutions and accordingly, such funds are subject to minimal credit risk. The Company has not experienced any losses on its cash deposits. The contribution receivable is unsecured and is concentrated with one third-party organization, and accordingly the Company may be exposed to credit risk. To date, the Company has not experienced any loss related to its contributions receivable.

The Company's investment policy limits investments to certain types of securities issued by the U.S. government, its agencies and institutions with investment-grade credit ratings and places restrictions on maturities and concentration by type and issuer. The Company is exposed to credit risk in the event of a default by the financial institutions holding its cash, cash equivalents, restricted cash and marketable securities and issuers of marketable securities to the extent recorded on the balance sheets. As of December 31, 2019, the Company had no off-balance sheet concentrations of credit risk.

The Company is also exposed to market risk in its strategic investments. As of December 31, 2019, the Company held an investment in common stock which is publicly traded.

The Company depends on third-party suppliers for key raw materials used in its manufacturing processes and is subject to certain risks related to the loss of these third-party suppliers or their inability to supply the Company with adequate raw materials.

Contribution Revenue

The Company recognizes contribution revenue related to the receipt of cash from third-party resource providers not considered to be customers and where the transfer of assets is not an exchange transaction or financing of research

and development. Contribution revenue and related receivables are recognized for conditional contributions as the conditions related to the contribution are relieved.

In July 2017, the Company entered an arrangement with a third-party organization under which the Company would be provided with up to $1.5 million of funding for the performance of certain research and development activities during the 90-day period following the arrangement in pursuit of the third-party organization's philanthropic mission. All conditions related to this contribution were met during 2017 and the Company recognized $1.4 million under this arrangement, which was recorded as contribution revenue in the statement of operations.

Research and Development Expenses and Accruals

Costs related to research, design and development of drug candidates are charged to research and development expense as incurred. Research and development costs include, but are not limited to, payroll and personnel expenses for personnel contributing to research and development activities, laboratory supplies, outside services, licenses acquired to be used in research and development, manufacturing of clinical material, pre-clinical testing and consultants and allocated overhead, including rent, equipment, depreciation and utilities. Research and development costs are expensed as incurred unless there is an alternative future use in other research and development projects. Payments made prior to the receipt of goods or services to be used in research and development are deferred and recognized as expense in the period in which the related goods are received or services are rendered. Such payments are evaluated for current or long-term classification based on when they will be realized.

As part of the process of preparing our financial statements, we are required to estimate expenses resulting from our obligations under contracts with vendors and consultants and clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided under such contracts. Our objective is to reflect the appropriate expenses in our financial statements by matching those expenses with the period in which services and efforts are expended. We account for these expenses according to the progress of the production of clinical trial materials or based on progression of the clinical trial, as measured by patient progression and the timing of various aspects of the trial. We determine accrual estimates by taking into account discussion with applicable personnel and outside service providers as to the progress or state of consummation of goods and services, or the services completed. During the course of a clinical trial, we adjust the rate of expense recognition if actual results differ from our estimates. We make estimates of accrued expenses as of each balance sheet date in our financial statements based on the facts and circumstances known at that time. Our clinical trial accrual is dependent in part upon the timely and accurate reporting of contract research organizations, contract manufacturers and other third-party vendors. 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 our reporting changes in estimates in any particular period. Adjustments to prior period estimates have not been material for the years ended December 31, 2019 and 2018.

We have and may continue to enter into license agreements to access and utilize certain technology. We evaluate if the license agreement is an acquisition of an asset or a business. To date none of our license agreements have been considered to be an acquisition of a business. For asset acquisitions, the upfront payments to acquire such licenses, as well as any future milestone payments made before product approval, are immediately recognized as research and development expense when due, provided there is no alternative future use of the rights in other research and development projects. These license agreements may also include contingent consideration in the form of cash and additional issuances of our common stock.

Contingent Consideration Liability

The Company has entered into and may continue to enter into, license agreements to access and utilize certain technology. In each case, the Company evaluates if the license agreement results in the acquisition of an asset or a business. To date none of the Company's license agreements have been considered an acquisition of a business. For asset acquisitions, the upfront payments to acquire such licenses, as well as any future milestone payments made before product approval, are immediately recognized as research and development expense when due, provided there is no alternative future use of the rights in other research and development projects. These license agreements

also include contingent consideration in the form of additional issuances of the Company's common stock based on the achievement of certain milestones. For asset acquisitions, the Company assesses on a continuous basis whether such contingent consideration meets the definition of a derivative and can or cannot be classified within stockholders' equity, until such time that equity classification criteria are met or the milestones expire. The derivative related to this contingent consideration is measured at fair value as of each balance sheet date with the related change in fair value being reflected in operating expenses. Upon a reassessment event that results in the contingent consideration no longer meeting the definition of a derivative and/or meeting equity classification criteria, the final change in fair value of the instrument is recorded within operating expenses and the liability is reclassified into stockholders' equity.

Variable Interest Entities

The Company reviews agreements it enters into with third-party entities, pursuant to which the Company may have a variable interest in the entity, in order to determine if the entity is a variable interest entity ("VIE"). If the entity is a VIE, the Company assesses whether or not it is the primary beneficiary of that entity. In determining whether the Company is the primary beneficiary of an entity, the Company applies a qualitative approach that determines whether it has both (i) the power to direct the economically significant activities of the entity and (ii) the obligation to absorb losses of, or the right to receive benefits from, the entity that could potentially be significant to that entity. If the Company determines it is the primary beneficiary of a VIE, it consolidates that VIE into the Company's financial statements. The Company's determination about whether it should consolidate such VIEs is made continuously as changes to existing relationships or future transactions may result in a consolidation or deconsolidation event.

Property and Equipment, Net

Property and equipment are stated at cost, less accumulated depreciation. Depreciation is calculated using the straight-line method over the estimated useful lives of the respective assets, generally three years. Leasehold improvements are amortized on a straight-line basis over the shorter of their estimated useful lives or the term of the lease. Depreciation and amortization begins at the time the asset is placed in service. Maintenance and repairs are charged to expense as incurred and costs of improvement are capitalized.

Impairment of Long-Lived Assets

The Company evaluates long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying value of an asset may not be fully recoverable. If indicators of impairment exist and the undiscounted future cash flows that the assets are expected to generate are less than the carrying value of the assets, the Company reduces the carrying amount of the assets through an impairment charge, to their estimated fair values based on a discounted cash flow approach or, when available and appropriate, to comparable market values. No impairment losses have been recorded for the periods presented.

Leases

The Company leases office space and laboratory facilities under non-cancelable operating lease agreements and recognizes related rent expense on a straight-line basis over the term of the lease. Incentives granted under the Company's facilities lease, including allowances to fund leasehold improvements and rent holidays, and are recognized as reductions to rental expense on a straight-line basis over the term of the lease. Lessor funded leasehold improvement incentives not yet received are recorded in prepaid expense and other current assets on the balance sheet. The Company does not assume renewals in its determination of the lease term unless they are deemed to be reasonably assured at the inception of the lease and begins recognizing rent expense on the date that it obtains the legal right to use and control the leased space. Deferred rent consists of the difference between cash payments and the rent expense recognized. The Company recognizes a liability for costs that will continue to be incurred under a lease contract for its remaining term without economic benefit at its fair value when the entity ceases using the right conveyed by the contract, which is it when the space is completely vacated.

The Company entered into capital lease agreements for certain equipment with a lease term of three years. The current portion of capital lease obligations is included in accrued and other liabilities and the noncurrent capital lease obligations is included in other noncurrent liabilities in the balance sheet.

Stock-Based Compensation

The Company measures employee and director stock-based compensation expense for all stock-based awards based on their grant date fair value. For stock-based awards with service conditions only, stock-based compensation expense is recognized over the requisite service period using the straight-line method. For awards with performance conditions, the Company evaluates the probability of achieving performance condition at each reporting date. The Company begins to recognize stock-based compensation expense using an accelerated attribution method when it is deemed probable that the performance condition will be met. Forfeitures are recognized as they occur.

The Company uses the Black-Scholes option-pricing model to estimate the fair value of stock option awards that do not contain market conditions. The Black-Scholes option-pricing model requires assumptions to be made related to the expected term of an award, expected dividends, expected volatility and risk-free rate. The Company uses the lattice models to estimate the fair value of stock option awards that contain market conditions. Lattice models require the use of subjective and complex assumptions which determine the fair value of such awards including price volatility of the underlying stock and derived service periods.

The Company recognizes stock-based compensation expense for stock options granted to non-employees based on the estimated fair value of the award as it is more readily measurable than the fair value of the services received. The fair value of stock options granted to non-employees is estimated at grant date and re-measured at each reporting period using the Black-Scholes option-pricing model until the awards vest and the resulting change in value, if any, is recognized in the statements of operations.

Income Taxes

The Company uses the asset and liability method of accounting for income taxes, in which deferred tax assets and liabilities are recognized for future tax consequences attributable to the differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using the enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be reversed. The effect on deferred tax assets and liabilities of a change in tax rates is recognized as income in the period that includes the enactment date. A valuation allowance is established if it is more likely than not that all or a portion of the deferred tax asset will not be realized.

The Company’s tax positions are subject to income tax audits. The Company recognizes the tax benefit of an uncertain tax position only if it is more likely than not that the position is sustainable upon examination by the taxing authority, based on the technical merits. The tax benefit recognized is measured as the largest amount of benefit which is more likely than not to be realized upon settlement with the taxing authority. The Company recognizes interest accrued and penalties related to unrecognized tax benefits in its tax provision. The Company evaluates uncertain tax positions on a regular basis. The evaluations are based on a number of factors, including changes in facts and circumstances, changes in tax law, correspondence with tax authorities during the course of the audit, and effective settlement of audit issues. The provision for income taxes includes the effects of any accruals that the Company believes are appropriate, as well as the related net interest and penalties.

Net Loss per Common Share

Basic net loss per share is calculated by dividing net loss by the weighted average number of shares outstanding for the period. Diluted net loss per share is calculated by dividing net loss by the weighted average number of shares of common stock and potential dilutive common stock equivalents outstanding during the period if the effect is dilutive. The calculation of diluted earnings (loss) per share also requires that, to the extent the presumed issuance of additional shares as contingent consideration is dilutive to earnings (loss) per share for the period, adjustments to net income or net loss used in the calculation are required to remove the change in fair value of the contingent consideration liability for the period. Likewise, adjustments to the denominator are required to reflect the related

dilutive shares. In all periods presented, the Company's outstanding stock options, convertible preferred stock, early exercised common stock subject to future vesting, restricted stock accounted for as options common and preferred stock warrants and presumed issuance of additional shares as contingent consideration were excluded from the calculation of diluted net loss per share because their effects were antidilutive.

Comprehensive Loss

Comprehensive loss includes net loss and certain changes in stockholders' deficit that are excluded from net loss, primarily unrealized losses on the Company's marketable securities.

Recently Adopted Accounting Pronouncements

In January 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-01, *Financial Instruments Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities.* This guidance makes amendments to the classification and measurement of financial instruments and revises the accounting related to: (1) the classification and measurement of investments in equity securities (except for investments accounted for under the equity method of accounting); and (2) the presentation of certain fair value changes for financial liabilities measured at fair value. In addition, the update also amends certain disclosure requirements associated with the fair value of financial instruments. The guidance is effective for the Company for annual periods beginning in 2019 and interim periods beginning in 2020. Early adoptions of certain amendments within the update are permitted. The Company adopted this guidance during the first quarter of fiscal year 2019. The adoption of this guidance did not have a material impact on the Company's financial statements other than to the treatment of its strategic investment in Ascentage International subsequent to their initial public offering.

In January 2017, the FASB issued ASU No. 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business*. This ASU clarifies the definition of a business when evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The guidance is effective for the Company for fiscal years beginning after December 15, 2018, and interim periods within fiscal years beginning after December 15, 2019. Early adoption is permitted. The Company adopted this ASU during the first quarter of fiscal year 2019. The adoption of this ASU did not have a significant impact on its financial statements and related disclosures.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 230: Classification of Certain Cash Receipts and Cash Payments)*. This guidance addresses specific cash flow issues with the objective of reducing the diversity in practice for the treatment of these issues. The areas identified include: debt prepayment or debt extinguishment costs; settlement of zero-coupon debt instruments; contingent consideration payments made after a business combination; proceeds from the settlement of insurance claims; proceeds from the settlement of corporate-owned life insurance policies; distributions received from equity method investees; beneficial interests in securitization transactions; and application of the predominance principle with respect to separately identifiable cash flows. The guidance will generally be applied retrospectively and is effective for fiscal years beginning after December 15, 2018, and interim periods within fiscal years beginning after December 15, 2019. Early adoption is permitted. The Company adopted this ASU during the first quarter of fiscal year 2019. The adoption of this ASU did not have a significant impact on its financial statements and related disclosures.

Recently Issued Accounting Pronouncements Not Yet Adopted

In November 2018, the FASB issued ASU No. 2018-18, Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606 (ASU 2018-18), which clarifies that certain transactions between collaborative arrangement participants should be accounted for as revenue under the guidance for contracts with customers (Topic 606) when the collaborative arrangement participant is a customer in the context of a unit of account. The standard is effective for interim and annual periods beginning after December 15, 2020 , with early adoption permitted, including adoption in any interim period for public business entities for periods in which financial statements have not been issued. The Company is still finalizing its analysis and evaluating the impact adopting this new accounting standard will have on its financial statements and related disclosures.

In August 2018, the FASB issued ASU No. 2018-15, *Intangibles (Topic 350): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract*, which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. This new standard also requires customers to expense the capitalized implementation costs of a hosting arrangement that is a service contract over the term of the hosting arrangement. This standard is effective for the Company for annual reporting periods beginning after December 15, 2020, and interim periods within annual periods beginning after December 15, 2021. This new standard can be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. The Company is currently evaluating the impact of adoption on its financial statements.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement*. This ASU eliminates, modifies and adds disclosure requirements for fair value measurements. The amendments in this ASU are effective for fiscal years, and for interim periods within those fiscal years, beginning after December 15, 2019, with early adoption permitted. The Company does not expect the adoption of this new standard to have a significant impact on its disclosures.

In June 2018, the FASB issued ASU No. 2018-07, *Compensation – Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*. The amendments in this ASU expand the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. This new guidance is effective for the Company in fiscal years beginning after December 15, 2019, and interim periods within fiscal years beginning after December 15, 2020. Early adoption is permitted. The Company will adopt this standard on January 1, 2020 and does not currently expect it will have a material impact on its financial statements.

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments-Credit Losses (Topic 326), Measurement of Credit Losses on Financial Instruments*, as clarified in subsequent amendments. ASU 2016-13 changes the impairment model for certain financial instruments. The new model is a forward-looking expected loss model and will apply to financial assets subject to credit losses and measured at amortized cost and certain off-balance sheet credit exposures. This includes loans, held-to-maturity debt securities, loan commitments, financial guarantees and net investments in leases, as well as trade receivables. For available-for-sale debt securities with unrealized losses, credit losses will be measured in a manner similar to today, except that the losses will be recognized as allowances rather than reductions in the amortized cost of the securities. In October 2019, the FASB voted to delay the effective date of this standard. Topic 326 will be effective for the Company for fiscal years beginning after December 15, 2022. Early adoption is permitted. The Company is currently assessing the effect that this ASU will have on its financial position, results of operations, and disclosures.

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*, and related amendments which supersedes the guidance in former ASC 840, Leases. The new standard, as amended by subsequent ASUs on the Topic, requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less will be accounted for similar to existing guidance for operating leases today. On November 15, 2019, the FASB issued ASU 2019-10 to delay the effective date of this standard. Topic 842 is now effective for the Company for annual reporting periods beginning after December 15, 2020, and interim periods within annual periods beginning after December 15, 2021. Early adoption is permitted. The Company expects to adopt this standard on January 1, 2020 using the modified retrospective approach with a cumulative effect adjustment to accumulated deficit at the beginning of the period of adoption. The Company also expects to adopt certain practical expedients provided by Topic 842. Topic 842 is expected to impact the Company's financial statements as the Company has certain operating lease arrangements for which the Company is the lessee. As permitted by the standard, the Company will elect the transition practical expedient package, which among other things, allows the carryforward of historical lease classifications. The adoption of this accounting standard update is also expected to impact the Company's financial statement disclosures. While the Company is finalizing its evaluation of the impact of adopting this accounting standard update on its financial statements and related disclosures, the Company expects to recognize on its balance sheet for associated leases a new right of use ("ROU") assets ranging from $22.0 million to $27.0 million

and lease liability ranging from $37.0 million to $42.0 million, with the difference between ROU assets and lease liability attributed to the elimination of remaining unamortized lease incentive obligations, and deferred rent balances. The adoption of this standard are also expected to impact the Company's financial statement disclosures.

3. Fair Value Measurements

The Company determines the fair value of financial and non-financial assets and liabilities based on the assumptions that market participants would use in pricing the asset or liability in an orderly transaction between market participants at the measurement date. The identification of market participant assumptions provides a basis for determining what inputs are to be used for pricing each asset or liability. A fair value hierarchy has been established which gives precedence to fair value measurements calculated using observable inputs over those using unobservable inputs. This hierarchy prioritized the inputs into three broad levels as follows:

- Level 1: Quoted prices in active markets for identical instruments
- Level 2: Other significant observable inputs (including quoted prices in active markets for similar instruments)
- Level 3: Significant unobservable inputs (including assumptions in determining the fair value of certain investments)

The carrying amounts of financial instruments such as cash and cash equivalents, restricted cash, prepaid expenses and other current assets, accounts payable, accrued compensation, accrued and other current liabilities approximate the related fair values due to the short maturities of these instruments.

The fair value of the Company's cost method investment was measured when it was deemed to be other-than-temporarily impaired until the nature of the underlying investment changed to be an equity security with a readily determinable fair value which is measured at fair value on a recurring basis.

The Company's financial assets subject to fair value measurements on a recurring basis and the level of inputs used in such measurements were as follows (in thousands):

	December 31, 2019			
	Total	Level 1	Level 2	Level 3
Assets:				
Cash equivalents:				
Money market funds	$ 29,377	$ 29,377	$ —	$ —
U.S. and foreign commercial paper	4,999	—	4,999	—
U.S government debt securities	2,550	—	2,550	—
Total cash equivalents	36,926	29,377	7,549	—
Short-term marketable securities:				
U.S. treasuries	15,063	—	15,063	—
U.S. and foreign commercial paper	11,972	—	11,972	—
U.S. and foreign corporate debt securities	8,755	—	8,755	—
U.S. government debt securities	48,718	—	48,718	—
Total short-term marketable securities	84,508	—	84,508	—
Strategic investments				
Foreign equity securities	5,507	5,507	—	—
Total strategic investments	5,507	5,507	—	—
Long-term marketable securities				
U.S. treasuries	3,025	—	3,025	—
Total long-term marketable securities	3,025	—	3,025	—
Total assets subject to fair value measurements on a recurring basis	$ 129,966	$ 34,884	$ 95,082	$ —
Liabilities:				
Contingent consideration liability	$ 1,131	$ —	$ —	$ 1,131
Total liabilities subject to fair value measurements on a recurring basis	$ 1,131	$ —	$ —	$ 1,131

	December 31, 2018			
	Total	Level 1	Level 2	Level 3
Assets:				
Cash equivalents:				
Money market funds	$ 14,131	$ 14,131	$ —	$ —
Total cash equivalents	14,131	14,131	—	—
Short-term marketable securities:				
U.S. treasuries	34,121	—	34,121	—
U.S. and foreign commercial paper	10,635	—	10,635	—
U.S. and foreign corporate debt securities	26,533	—	26,533	—
Asset-backed securities	2,748	—	2,748	—
U.S. government debt securities	81,699	—	81,699	—
Total short-term marketable securities	155,736	—	155,736	—
Total assets subject to fair value measurements on a recurring basis	$ 169,867	$ 14,131	$ 155,736	$ —
Liabilities:				
Contingent consideration liability	$ 2,483	$ —	$ —	$ 2,483
Total liabilities subject to fair value measurements on a recurring basis	$ 2,483	$ —	$ —	$ 2,483

The Company estimates the fair value of its money market funds, U.S. and foreign commercial paper, U.S. and foreign corporate debt securities, asset-backed securities, U.S. treasuries, U.S. government debt securities and

foreign debt securities by taking into consideration valuations obtained from third-party pricing services. The pricing services utilize industry standard valuation models, including both income and market-based approaches, for which all significant inputs are observable, either directly or indirectly, to estimate fair value. These inputs include reported trades of and broker/dealer quotes on the same or similar securities, issuer credit spreads; benchmark securities; prepayment/default projections based on historical data; and other observable inputs.

The fair value of the contingent consideration liability includes inputs not observable in the market and thus represents a Level 3 measurement. The Company has recorded a contingent consideration liability related to three agreements with a clinical-stage biopharmaceutical company (see Note 5, “License Agreements”). As of December 31, 2019, these Commercial Agreements included contingent consideration of up to an aggregate of 533,336 additional shares of common stock to be issued in specified portions to Ascentage Pharma and an academic institution from which Ascentage Pharma had previously in-licensed the underlying technology based on achievement of certain specified preclinical and clinical development and sales milestone events. The probability of achieving the defined milestone events under the Commercial Agreements is estimated on a quarterly basis by the Company’s management using a probability-weighted valuation approach model which reflects the probability and timing of future issuances of shares. Total contingent consideration may change significantly as preclinical and clinical development related to the compounds covered by the Commercial Agreements progresses and additional data is obtained, impacting the Company’s assumptions regarding probabilities of and timing for successful achievement of the related milestone events. For example, significant increases in the estimated probability of achieving a milestone would result in a significant higher fair value measurement while significant decreases in the estimated probability of achieving a milestone would result in a significantly lower fair value measurement. The potential outstanding contingent consideration value results in shares to be issued ranging from zero, if none of the milestones are achieved, to a maximum of $4.6 million (using the Company’s stock price as of December 31, 2019). As of December 31, 2019, and December 31, 2018, none of the commercial milestones had been achieved and no royalties were due from the sales of licensed products.

As of December 31, 2018, the Company determined that the net settlement criteria of the definition of a derivative had been met for 133,333 shares of common stock to the third parties and recorded a settlement liability of $2.0 million. The Company issued 106,667 of these shares in January 2019 and the remaining 26,667 shares in March 2019. The settlement liability recorded at December 31, 2018 was reclassified to stockholders’ equity upon the issuance of these shares. The Company recorded a contingent consideration liability of $1.1 million at December 31, 2019 related to additional potential shares subject to the achievement of certain specified clinical development and sales milestone events under the agreements. The following table provides a reconciliation of assets and liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) (in thousands):

	Amount
Balance at December 31, 2018	$ 2,483
Additions	—
Settlements	—
Change in fair value	(1,352)
Balance at December 31, 2019	$ 1,131

The Company holds an equity investment in a clinical-stage biopharmaceutical company. The equity interest represents an insignificant level of ownership in the investee and has been recorded within strategic investments on the Company’s balance sheet (see Note 5, “License Agreements”). In October 2019, the investee completed an initial public offering of common stock on the Hong Kong stock exchange at HK$34.20 (approximately USD $4.36) per share. Following the initial public offering, the underlying investment changed to be an equity security with a readily determinable fair value which is measured at fair value on a recurring basis based on quoted stock price available on the Hong Kong Stock Exchange, which are considered observable inputs (Level 1). The investment was $5.5 million as of December 31, 2019 and is included in strategic investments. The investment was $1.0 million as of December 31, 2018 and is included in other long-term assets. The change in fair value of this investment for the twelve months ended December 31, 2019 and December 31, 2018 was $4.5 million and zero, respectively.

There were no transfers between the hierarchies during the years ended December 31, 2019 and 2018.

See Note 4, ‘Investments,” for further information regarding the carrying value of the Company's financial instruments.

4. Investments

Marketable Securities

Marketable debt securities, which are classified as available-for-sale, consisted of the following (in thousands):

	December 31, 2019			
	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
Cash equivalents:				
Money market funds	$ 29,377	$ —	$ —	$ 29,377
U.S. and foreign commercial paper	4,999	—	—	4,999
U.S. government debt securities	2,550	—	—	2,550
Total cash equivalents	36,926	—	—	36,926
Short-term marketable securities:				
U.S. and foreign commercial paper	11,965	7	—	11,972
U.S. and foreign corporate debt securities	8,748	8	(1)	8,755
U.S. government debt securities	48,647	71	—	48,718
U.S. treasuries	15,057	6	—	15,063
Total short-term marketable securities	84,417	92	(1)	84,508
Long-term marketable securities				
U.S. treasuries	3,025	—	—	3,025
Total long-term marketable securities	3,025	—	—	3,025
Total marketable securities	$ 124,368	$ 92	$ (1)	$ 124,459

	December 31, 2018			
	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
Cash equivalents:				
Money market funds	$ 14,131	$ —	$ —	$ 14,131
Total cash equivalents	14,131	—	—	14,131
Short-term marketable securities:				
U.S. and foreign commercial paper	10,638	—	(3)	10,635
U.S. and foreign corporate debt securities	26,552	2	(21)	26,533
Asset-backed securities	2,750	—	(2)	2,748
U.S. government debt securities	81,755	1	(57)	81,699
U.S. treasuries	34,136	1	(16)	34,121
Total short-term marketable securities	155,831	4	(99)	155,736
Total marketable securities	$ 169,962	$ 4	$ (99)	$ 169,867

At December 31, 2019, the remaining contractual maturities of available-for-sale debt securities were less than two years. There have been no significant realized gains or losses on available-for-sale debt securities for the periods presented. Available-for-sale debt securities that were in a continuous loss position but were not deemed to be other than temporarily impaired were immaterial at both December 31, 2019 and 2018. The Company does not intend to and believes it is not more likely than not that it will be required to sell these debt securities before their maturities.

See Note 3, “Fair Value Measurements,” for further information regarding the fair value of the Company's financial instruments.

5. License Agreements

License and Compound Library and Option Agreement and Related License Agreements with Ascentage

The Company is a party to three agreements with Ascentage Pharma Group Corp. Limited, a clinical-stage biopharmaceutical company based in Hong Kong, China ("Ascentage Pharma"): (a) a compound library and option agreement executed in February 2016 granting the Company the right to identify and take licenses to research, develop, and seek and obtain marketing approval for library compounds for the treatment of indications outside of oncology, (b) an initial license agreement executed in February 2016 granting the Company rights to an initial licensed compound, and (c) a second license agreement executed in January 2019 granting the Company rights to a second licensed compound (collectively, the "Commercial Agreements"). As of December 31, 2019, as part of these agreements, the Company had issued 640,002 shares of common stock to Ascentage Pharma and 160,000 shares of common stock to an academic institution from whom Ascentage Pharma had previously licensed the technology.

The Commercial Agreements referenced above include cash payments of up to $70.3 million as well as remaining equity payments of up to an aggregate 533,336 additional shares of common stock, in each case to be issued based on the Company's achievement of certain specified clinical development and sales milestone events. The milestones include the filing of an investigational drug application, the commencement of clinical studies, Food and Drug Administration and/or European Medicines Agency approval, and a net sales threshold. The license agreement also includes tiered royalties in the low-single digits based on sales of licensed products.

In December 2018, the Company elected to advance the second compound into formal preclinical development which gave rise to an obligation under the compound library and option agreement to issue 133,334 shares of common stock to Ascentage Pharma and the academic institution. These shares were issued to Ascentage Pharma in January 2019 and the academic institution in March 2019. In connection with the additional shares of common stock that the Company may be obligated to issue under the Commercial Agreements upon achievement of the specified milestones events, the Company recorded a contingent consideration liability of $1.1 million at December 31, 2019 and $2.5 million at December 31, 2018. The $1.1 million contingent consideration liability was recorded as a current liability based on the latest estimates for milestone achievements. To date, no royalties were due from the sales of licensed products.

In April 2016, in connection with the Commercial Agreements the Company purchased an interest in an affiliate of Ascentage Pharma for an aggregate purchase price of $0.5 million. In May 2018, this interest was exchanged for an interest in a newly formed affiliate of Ascentage Pharma called Ascentage Pharma Group International ("Ascentage International") as part of a reorganization of those entities. The Company also invested an additional $0.5 million in Ascentage International in May 2018 which was recorded within other long-term assets on the Company's balance sheet as of December 31, 2018.

In October 2019, Ascentage International completed an initial public offering of shares of its common stock on the Hong Kong stock exchange at HK$34.20 (approximately USD $4.36) per share. In connection with Ascentage International's initial public offering, the Company's interest converted into shares of common stock of Ascentage International. The Company determined that its investment in Ascentage International met the definition of an equity security with a readily determinable fair value which is measured at fair value on a recurring basis based on quoted stock price available on the Hong Kong Stock Exchange. The Company is subject to a lock-up agreement with Ascentage International that precludes the Company from selling shares prior to April 2020. The fair value of the Company's investment in Ascentage International as of December 31, 2019 was $5.5 million, which was included in strategic investments. The fair value investment of the Company's in Ascentage International as of December 31, 2018 was $1.0 million, which was included in other long-term assets.

The Company agreed to provide funding to Ascentage Pharma for research and development work performed at a cost of up to $2.0 million through February 2020. The research and development expense under the research services agreement was $0.5 million and $0.5 million for the years ended December 31, 2019 and 2018.

Under the consolidation guidance, the Company had previously determined that Ascentage Pharma was a VIE and the Company did not have the power to direct the activities that most significantly affect the economic performance of this entity. As such, the Company was not the primary beneficiary and consolidation is not required. Upon

completion of its initial public offering of common stock on the Hong Kong stock exchange, the Company determined that Ascentage Pharma no longer meets the definition of a VIE. As of December 31, 2019 and 2018, the Company has not provided financial, or other, support to Ascentage Pharma that was not contractually required.

Other License Agreements with Research Institutions

In May 2019, the Company entered into a license agreement with The Regents of the University of California on behalf its San Francisco campus (collectively, "UCSF") which provides the Company the rights to certain patents and related know-how to make, use, sell, offer for sale and import certain products and practice certain methods for use in the development of human therapeutics, which excludes the provision of services to third parties for consideration of any kind. The license to the Company is subject to UCSF's reserved rights under the licensed intellectual property for educational and non-commercial research purposes and a requirement to substantially manufacture any licensed products in the United States. The Company is obligated to use diligent efforts to develop and obtain regulatory approval for at least one product commercialized pursuant to the agreement, and must meet certain regulatory and development milestones. In June 2019, as part of this license agreement, the Company issued 120,000 shares of its common stock to UCSF. In addition, the Company is obligated to pay an annual license maintenance fee and may be obligated to make milestone payments or issue up to an additional 34,000 shares of its common stock upon the occurrence of specified development events, up to aggregate milestone payments of $13.6 million for each product licensed under the agreement, and upon commercialization, to make royalty payments in the low single digit percentages (subject to a specified minimum annual royalty) based on net sales of products commercialized pursuant to the agreement. None of these events had occurred and no milestone payments or royalty payments had been recognized as of December 31, 2019. The upfront issuance of 120,000 shares of the Company's common stock was valued at $1.0 million at the time of issuance and recorded as additional paid-in capital upon issuance in June 2019.

The Company has also entered into license agreements with various research institutions which have provided the Company with rights to patents, and in certain cases, research "know-how" and proprietary research tools to research, develop and commercialize drug candidates. In addition to upfront consideration paid to these various research institutions in either cash or shares of the Company's common stock, the Company may be obligated to make milestone payments, payable in cash and/or the issuance of shares of the Company's common stock upon achievement of certain specified clinical development and/or sales events. The contingent consideration liability considered to be a derivative associated with the potential issuance of common stock related to these license agreements was not significant at December 31, 2019 or 2018. To date, none of these events has occurred and no contingent consideration, milestone or royalty payments have been recognized.

6. Balance Sheet Components

Property and Equipment, Net

Property and equipment, net, consists of the following (in thousands):

	December 31,	
	2019	2018
Laboratory equipment	$ 5,219	$ 4,162
Computer equipment	472	247
Furniture and fixtures	825	113
Leasehold improvements	16,436	5,366
Total property and equipment	22,952	9,888
Less: accumulated depreciation and amortization	(6,316)	(3,650)
Total property and equipment, net	$ 16,636	$ 6,238

Depreciation expense related to property and equipment was $2.7 million, $2.2 million and $1.3 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Accrued and Other Current Liabilities

Accrued and other current liabilities consist of the following (in thousands):

	December 31,	
	2019	2018
Accrued research and development	$ 2,214	$ 1,837
Deferred rent, current portion	1,849	783
Liability related to early exercise shares	237	885
Accrued other	695	1,485
	$ 4,995	$ 4,990

7. Commitments and Contingencies

Operating Lease

In February 2019, the Company entered into a lease agreement for new office and laboratory space in South San Francisco, California. The term of the lease agreement commenced in May 2019. The lease has an initial term of ten years from the commencement date, and the Company has an option to extend the initial term for an additional eight years at the then market rental rates as determined pursuant to the lease agreement. The total base rent payment escalates annually based on a fixed percentage beginning from the 13th month of the lease agreement. The Company will also be responsible for the operating expenses and tax expenses allocated to the building, and the operating expenses and tax expenses attributable to the common areas. Pursuant to the lease agreement, the landlord provided the Company with a tenant improvement allowance of up to $7.8 million and will finance up to $2.9 million for additional tenant improvements subject to repayment provisions as described in the lease agreement. The value of this tenant improvement allowance of $10.7 million was included in deferred rent and leasehold improvements on the balance sheet at December 31, 2019. In connection with the execution of the lease agreement, the Company delivered a letter of credit of approximately $0.9 million to the landlord.

In May 2016, the Company executed a non-cancellable lease agreement for office and laboratory space in Brisbane, California which commenced in May 2016 and continues through October 2022. The lease agreement includes an escalation clause for increased rent and a renewal provision allowing the Company to extend this lease for an additional four years by giving the landlord written notice of the election to exercise the option at least fifteen months prior to the original expiration of the lease term. The lease provides for monthly base rent amounts escalating over the term of the lease and the lessor provided the Company a $3.9 million tenant improvement allowance to complete the laboratory and office renovation which was recorded as deferred rent liability and leasehold improvements within property and equipment, net. In May 2017, the Company entered into an amendment to expand the leased space and received a three-month rent holiday for the expanded space.

As of December 31, 2019, the Company's future minimum payments under the noncancelable operating leases were as follows (in thousands):

	Amount
2020	$ 5,373
2021	6,230
2022	5,859
2023	4,386
2024 and later	29,272
Total future minimum lease payments	$ 51,120

Rent expense was $4.5 million, $1.8 million and $2.0 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Indemnifications

The Company indemnifies each of its officers and directors for certain events or occurrences, subject to certain limits, while the officer or director is or was serving at the Company's request in such capacity, as permitted under Delaware law and in accordance with the Company's amended and restated certificate of incorporation and bylaws. The term of the indemnification period lasts as long as an officer or director may be subject to any proceeding arising out of acts or omissions of such officer or director in such capacity.

The maximum amount of potential future indemnification is unlimited; however, the Company currently holds director and officer liability insurance. This insurance allows the transfer of risk associated with the Company's exposure and may enable the Company to recover a portion of any future amounts paid. The Company believes that the fair value of these potential indemnification obligations is minimal. Accordingly, the Company has not recognized any liabilities relating to these obligations for any period presented.

8. Related-Party Transactions

Recourse Notes

In December 2015, April 2016, and July 2016, the Company issued three full-recourse promissory notes to two executive officers for an aggregate principal amount of $0.2 million with an interest rate of 2.5% per annum. All of the principal was used to early exercise options for 667,253 shares of the Company's common stock, in aggregate. All of these related party full-recourse notes were repaid on April 4, 2018 in accordance with the terms of such notes.

In October 2017, the Company issued two promissory notes to an executive officer for $1.6 million and $0.5 million, each with an interest rate of 1.85% per annum. The aggregate principal amount of $2.1 million was used to purchase 625,084 shares of restricted stock. The promissory notes were considered to be non-recourse in substance and accordingly, the shares sold subject to such promissory notes are considered to be an option for accounting purposes. In April 2018, the Company's board of directors approved the forgiveness of all outstanding principal and accrued interest of the $1.6 million non-recourse promissory note. The non-recourse promissory note outstanding of $0.5 million was repaid on April 4, 2018 in accordance with the terms of the note. The forgiveness of the promissory note was accounted for as a modification of a share-based payment. The Company recorded an incremental charge of $1.5 million related to the modification for the year ended December 31, 2018.

In January 2018, the Company issued full-recourse promissory notes to an executive and an executive officer of the Company for an aggregate principal amount of $0.4 million with an interest rate of 2.5% per annum. All of the principal was used to early exercise options for 114,406 shares of the Company's common stock. The full recourse note of $0.2 million for the executive officer was repaid on April 4, 2018 in accordance with the terms of the note. In December 2019, the full recourse note to an executive was deemed satisfied and superseded by a new full recourse promissory note agreement with a principal amount of $0.2 million and an interest rate of 1.51% per annum.

Financing Activities

During the year ended December 31, 2018, the Company issued convertible preferred stock for total proceeds of $3.0 million to shareholders who are considered to be related parties.

9. Common and Preferred Stock

The Company has 10,000,000 shares of convertible preferred stock authorized for issuance, par value of $0.0001 per share. As of December 31, 2019 and 2018, no shares of preferred stock were issued and outstanding. In connection with the Company's IPO, all outstanding shares of convertible preferred stock were automatically converted into 32.1 million shares of common stock.

The Company has 300,000,000 shares of common stock authorized for issuance, par value of $0.0001 per share. Holders of the Company's common stock are entitled to one vote per share. As of December 31, 2019 and 2018, there were 47,227,065 and 42,414,294 shares of common stock issued and outstanding.

Sale of Common and Preferred Stock

In March 2017, the Company issued an aggregate of 659,821 shares of Series B convertible preferred stock at $12.125 per share for gross proceeds of $8.0 million.

In June 2017, the Company closed the second and final tranche of its Series B convertible preferred stock round of financing by selling an aggregate of 2,879,288 shares of Series B convertible preferred stock at $12.125 per share for gross proceeds of $34.9 million.

In March 2018, the Company amended and restated its certificate of incorporation to, among other things, (i) increase its authorized shares of common stock from 122,000,000 to 140,000,000 shares, (ii) increase its authorized shares of preferred stock from 91,739,149 to 103,283,818 shares, of which 11,544,669 shares were designated as Series C convertible preferred stock, and (iii) set forth the rights, preferences and privileges of the Series C convertible preferred stock. In March 2018, the Company sold 3,590,573 shares of Series C convertible preferred stock at $15.3317 per share for net proceeds of $54.9 million and in April 2018, the Company sold an additional 322,852 shares of Series C convertible preferred stock $15.3317 per share for net proceeds of $5.0 million.

On May 7, 2018, the Company closed its initial public offering ("IPO"), of 5,000,000 shares of common stock, at an offering price to the public of $17.00 per share. The Company received net proceeds of approximately $75.9 million, after deducting underwriting discounts, commissions and offering related transaction costs of approximately $9.1 million. In connection with the IPO, all of the Company's outstanding shares of convertible preferred stock were automatically converted into 32,073,149 shares of common stock. In addition, all of the Company's convertible preferred stock warrants were converted into warrants to purchase shares of common stock.

In connection with the completion of its IPO, on May 7, 2018, the Company's certificate of incorporation was amended and restated to provide for 300,000,000 authorized shares of common stock with a par value of $0.0001 per share and 10,000,000 authorized shares of preferred stock with a par value of $0.0001 per share.

In June 2019, the Company filed a Registration Statement on Form S-3 (the "Shelf Registration Statement"), covering the offering of up to $250.0 million of common stock, preferred stock, debt securities, warrants and units. The Shelf Registration Statement included a prospectus covering the offering, issuance and sale of up to $75.0 million of the Company's common stock from time to time through an "at-the-market" offering under the Securities Act of 1933, as amended (the "ATM Offering Program"). The SEC declared the Shelf Registration Statement effective on June 6, 2019.

In June 2019, the Company also entered into a sales agreement (the "Sales Agreement") with Cowen and Company, LLC ("Cowen") to sell shares of the Company's common stock, from time to time, with aggregate gross sales proceeds of up to $75.0 million, through the ATM Offering Program under which Cowen will act as its sales agent Cowen is entitled to compensation for its services equal to up to 3.0% of the gross proceeds of any shares of common stock sold through Cowen under the Sales Agreement. In addition, the Company has agreed to reimburse a portion of the expenses of Cowen in connection with the offering up to a maximum of $0.1 million. During the year ended December 31, 2019, the Company issued and sold 3,974,908 shares of its common stock through its ATM Offering Program and received net proceeds of approximately $26.1 million, after deducting commissions and other offering expenses of $1.4 million.

10. Stock-Based Compensation

Equity Incentive Plans

In March 2018, the Company's board of directors adopted the Company's 2018 Incentive Award Plan (the "2018 Plan"). The 2018 Plan was approved by the Company's stockholders in April 2018 and became effective on May 2,

2018. The 2018 Plan initially reserved 4,289,936 shares for the issuance of stock options as well as any automatic annual increases in the number of shares of common stock reserved for future issuance under the 2018 Plan. Awards granted under the 2018 Plan expire no later than ten years from the date of grant. For stock options, the option price shall not be less than 100% of the estimated fair value on the day of grant. Options granted typically vest over a four-year period but may be granted with different vesting terms. Unvested options not exercised at the time of an employee's termination of employment are added back to the 2018 Plan.

Following the Company's IPO and in connection with the effectiveness of the 2018 Plan, the 2013 Equity Incentive Plan (the "2013 Plan") terminated and no further awards will be granted under that plan. All outstanding awards under the 2013 Plan will continue to be governed by their existing terms and the shares that remained outstanding for issuance under the 2013 Plan were transferred into the 2018 Plan. As of December 31, 2019, there was an aggregate 6,846,928 shares of common stock authorized for issuance under the 2018 Plan.

Prior to its termination, the 2013 Plan provided for the granting of incentive stock options ("ISOs"), non-statutory stock options ("NSOs") and restricted shares to employees, directors, and consultants at the discretion of management and the Board of Directors. The exercise price of an ISO and NSO shall not be less than 100% of the estimated fair value of the shares on the date of grant, and the exercise price of an ISO and NSO granted to a 10% stockholder shall not be less than 110% of the estimated fair value of the shares on the date of grant. For awards granted between September 2017 and February 2018 with an exercise price of $3.42, a deemed fair value ranging from $3.95 to $8.47 per share was used in calculating stock-based compensation expense, which was determined using management hindsight. Options granted under the 2013 Plan expire no later than 10 years from the date of grant and generally vest over a four-year period but may be granted with different vesting terms. Unvested options not exercised at the time of an employee's termination of employment are added back to the 2018 Plan.

Under the 2013 Plan, the Company permitted early exercise of certain stock options prior to vesting. These unvested shares are subject to repurchase by the Company at the original issuance price in the event the optionee's employment is terminated either voluntarily or involuntarily. The amounts paid for shares purchased under an early exercise of stock options and subject to repurchase by the Company are reported as a liability and reclassified into additional paid-in capital as the shares vest.

Stock Options and Restricted Stock Units (RSUs) Activity

A summary of the Company's stock option activity under the 2013 and 2018 Plan is as follows:

	Shares Available for Grant	Outstanding Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contract Term (in Years)	Aggregate Intrinsic Value (in thousands)
Balance at December 31, 2018	3,027,802	5,500,531	$ 6.75		
Shares Added	2,357,131	—	—		
Granted	(2,935,629)	2,582,912	8.78		
Exercised	—	(505,226)	1.66		
Canceled	467,016	(671,319)	9.47		
Balance at December 31, 2019	2,916,320	6,906,898	$ 7.62	8.20	$ 12,297
Vested and exercisable at December 31, 2019		2,574,677	$ 6.21	7.36	$ 7,269
Vested and expected to vest at December 31, 2019		6,906,898	$ 7.62	8.20	$ 12,297

The total intrinsic value of options exercised was $5.8 million, $1.5 million and $0.1 million for the years ended December 31, 2019, 2018 and 2017, respectively. The weighted-average estimated fair value of stock options granted was $7.12, $13.20 and $3.40 for the years ended December 31, 2019, 2018 and 2017, respectively.

The aggregate intrinsic value of options exercisable was $7.3 million and $21.9 million as of December 31, 2019 and 2018, respectively.

The following table summarizes the Company's RSU activity for the year ended December 31, 2019.

	Shares	Weighted-Average Grant Date Fair Value
Unvested at December 31, 2018	—	$ —
Granted	352,717	$ 9.00
Forfeited	(26,830)	$ 9.00
Unvested at December 31, 2019	325,887	$ 9.00

As of December 31, 2019, the total stock-based compensation cost related to options and RSUs granted but not yet amortized was $28.1 million and will be recognized over a weighted-average period of approximately 3.5 years. The total grant-date fair value of stock options granted to employees that vested during the years ended December 31, 2019 and 2018 was approximately $14.2 million and $3.5 million, respectively.

Stock Options Granted to Employees with Service-Based Vesting

The fair value of stock options granted to employees was estimated on the date of grant using the Black-Scholes option pricing model using the following assumptions:

	Year Ended December 31,		
	2019	2018	2017
Expected dividend yield	—	—	—
Expected term of options (in years)	6.1	6.1	5.6–6.7
Risk-free interest rate	1.59%-2.27%	2.6%-3.0%	1.8%–2.2%
Expected stock price volatility	99.4%-111.3%	87.4%-92.6%	77.0%–82.0%

The valuation assumptions were determined as follows:

Expected Term—The expected term represents the period that the options granted are expected to be outstanding and is determined using the simplified method (based on the mid-point between the vesting date and the end of the contractual term) as the Company has concluded that its stock option exercise history does not provide a reasonable basis upon which to estimate expected term.

Expected Volatility—The Company used an average historical stock price volatility of comparable public companies within the biotechnology and pharmaceutical industry that were deemed to be representative of future stock price trends as the Company does not have a sufficient historical trading history for its own common stock. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

Risk-Free Interest Rate—The Company based the risk-free interest rate over the expected term of the options based on the constant maturity rate of U.S. Treasury securities with similar maturities as of the date of the grant.

Expected Dividends—The Company has never paid any dividends and does not plan to pay dividends in the foreseeable future. Therefore, the expected dividend yield is zero.

Performance Contingent Stock Options Granted to Employees

During the year ended December 31, 2018, the Board of Directors granted performance contingent stock option awards exercisable for 53,575 shares, to certain members of the Company's executive team. These awards had a

weighted average exercise price of $3.42 which was based on the fair market value on the grant date, as determined by the Board of Directors, and vest upon the successful achievement of one or more specified performance goals.

The total estimated fair value of these awards was $0.4 million at the date of grant and was estimated using a Black-Scholes option-pricing model using the same assumptions as the stock options granted to employees with service-based vesting conditions.

As of December 31, 2018, there were 329,499 total performance contingent stock option awards outstanding with a total grant date fair value of $0.7 million. During the year ended December 31, 2019, the Company determined that the achievement of the requisite performance conditions was probable and, as a result, compensation cost of $0.7 million was recognized for these awards.

Performance and Market Contingent Stock Options Granted to Employees

During the year ended December 31, 2018, the Board of Directors granted performance and market contingent stock option awards exercisable for 160,727 shares of common stock to certain members of the Company's executive team. These awards had a weighted average exercise price of $3.42, which was based on the fair market value on the grant date, as determined by the Board of Directors. The total estimated grant-date fair value of these options was $1.0 million. Key assumptions in the valuation model included expected volatility, a risk-free interest rate, expected dividend yield, and an expected term unique to the terms of these awards.

Under the performance and market contingent awards, 53,575 of the shares have three separate market triggers for vesting based upon (i) the closing of a financing where the Company sells shares of its equity securities to institutional investors at a minimum price per share, (ii) a change in control with aggregate proceeds payable for the Company's common stock at a minimum price per share, or (iii) an initial public offering that becomes effective at a minimum specified price per share. The remaining 107,152 shares have three separate market triggers for vesting based upon (i) the closing of a financing where the Company sells shares of its equity securities to institutional investors at a minimum pre-money valuation, (ii) a change in control with minimum aggregate proceeds payable for the Company's common stock at a minimum price per share, or (iii) either an initial public offering or an achievement of a minimum market capitalization, as measured by a trailing 30 day volume-weighted average price.

By definition, the market condition in these awards can only be achieved after the performance condition of a liquidity event has been achieved. As such, the requisite service period is based on the estimated period over which the market condition can be achieved. When a performance goal is deemed to be probable of achievement, which for liquidity events is generally upon achievement, time-based vesting and recognition of stock-based compensation expense commence.

As of December 31, 2019 and 2018, there were 454,584 performance and market contingent stock option awards outstanding with a grant date total fair value of $1.5 million, respectively. As of December 31, 2019 and 2018, the Company determined that the achievement of the requisite performance conditions was not probable and, as a result, no compensation cost was recognized for these awards.

Stock-Based Compensation for Nonemployees

The Company has granted options to purchase shares of common stock to consultants in exchange for services performed. During the year ended December 31, 2018, the Company granted options to purchase an aggregate of 20,337 shares (of which an aggregate of 169,491 were issued outside of the 2018 and 2013 Plans) of the Company's common stock with a weighted average exercise price of $6.19 per share.

The fair value of stock options granted to nonemployees was estimated on the date of grant using the Black-Scholes option pricing model. The valuation assumptions used were substantially consistent with the assumption used to value the employee options with the exception of the expected term which was based on the contractual term of the award. During the years ended December 31, 2019 and 2018, stock-based compensation expense recognized related to nonemployee options was $0.4 million and $1.2 million, respectively.

Restricted Stock

A summary of the Company's restricted stock activity for the year ended December 31, 2019 is as follows:

	Shares	Weighted-Average Grant Date Fair Value
Unvested at December 31, 2018	359,229	$ 4.57
Vested	(359,229)	$ 4.57
Unvested at December 31, 2019	—	$ —

In October 2017, the Company and an executive officer entered into two restricted stock agreements whereby the executive officer purchased an aggregate of 625,084 shares of restricted stock of which 146,113 shares vested immediately, 119,742 shares vest on January 1, 2018 and 359,229 shares vest on January 1, 2019. As discussed in Note 8, Related-Party Transactions, the purchase of the restricted stock was through the issuance of promissory notes which were considered to be non-recourse in substance and accordingly, considered an option for accounting purposes. The Company measured compensation cost for this option based on its fair value on the grant date using the Black-Scholes option pricing model considering an expected term commensurate with the expected timing to a liquidity event which would trigger repayment of these promissory notes and an exercise price consistent with the repayment term of the promissory notes. The Company recognized compensation cost over the requisite service period with an offsetting credit to additional paid-in capital. The shares of restricted stock have only been included in the shares issued and outstanding as such shares are legally issued.

2018 Employee Stock Purchase Plan

In March 2018, the Company's board of directors adopted the Company's 2018 Employee Stock Purchase Plan (the "2018 ESPP"). The 2018 ESPP was approved by the Company's stockholders in April 2018 and became effective on May 2, 2018. The 2018 ESPP reserved 536,242 shares of common stock for issuance pursuant to future awards, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under this plan.

Under the 2018 ESPP, employees are offered the option to purchase the Company's common stock at a discount during the offering periods, at semi-annual intervals, with their accumulated payroll deductions. The option purchase price will be 85% of the lower of the closing trading price per share at the beginning of the offering period or at the purchase date. The 2018 ESPP provides for consecutive offering periods and eligible employees may elect to withhold up to 15% of their compensation through payroll deductions during the offering period for the purchase of stock. The maximum number of shares that may be purchased by any one participant is limited to 15,000 shares in each offering period and $25,000 in fair market value during any calendar year per the Internal Revenue Code limits. The first offering period commenced on September 16, 2018.

Stock-Based Compensation Expense

The following table sets forth the total stock-based compensation expense for all options granted to employees and nonemployees, including shares sold through the issuance of non-recourse promissory notes which are considered to be options for accounting purposes, and costs associated with the Company's 2018 ESPP included in the Company's statement of operations (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Research and development	$ 4,979	$ 6,043	$ 1,695
General and administrative	5,873	3,398	1,339
Total	$ 10,852	$ 9,441	$ 3,034

11. Warrants

In June 2013, the Company granted warrants to its then Chief Executive Officer ("CEO"), considered to be a related party, to purchase 192,823 shares of Series A-1 convertible preferred stock with an exercise price of $0.65 per share and 190,226 shares of Series A-2 convertible preferred stock at a price of $0.66 per share as compensation. In January 2015, the Company granted warrants to the aforementioned CEO to purchase an aggregate of 380,452 shares of Series A-2 convertible preferred stock with an exercise price of $0.66 per share as compensation. Upon the completion of the IPO, these warrants converted to common stock warrants. These warrants were exercisable beginning on January 1, 2018 and expired on the earlier of (i) December 31, 2018, (ii) December 31 of the year in which a change of control occurs or (iii) December 31 of the year in which the holder terminates service. All of the vested warrants expired unexercised on December 31, 2018.

In October 2013, the Company granted warrants to a nonemployee to purchase an aggregate of 96,610 shares of common stock with an exercise price of $0.18 per share of which 9,425 warrants vested immediately. During April 2018 the nonemployee exercised the vested shares and the remaining unvested warrants expired on May 3, 2018 upon the closing of the IPO.

12. Net Loss per Common Share

Basic net loss per share is calculated by dividing net loss by the weighted average number of shares outstanding for the period. Diluted net loss per share is calculated by dividing net loss by the weighted average number of shares of common stock and potential dilutive common stock equivalents outstanding during the period if the effect is dilutive.

The calculation of diluted earnings (loss) per share also requires that, to the extent the presumed issuance of additional shares as contingent consideration is dilutive to earnings (loss) per share for the period, adjustments to net income or net loss used in the calculation are required to remove the change in fair value of the contingent consideration liability for the period. Likewise, adjustments to the denominator are required to reflect the related dilutive shares. In all periods presented, the Company's outstanding stock options, convertible preferred stock, early exercised common stock subject to future vesting, restricted stock accounted for as options common and preferred stock warrants, shares subject to the 2018 ESPP and presumed issuance of additional shares as contingent consideration were excluded from the calculation of diluted net loss per share because their effects were antidilutive.

A reconciliation of the numerators and denominators used in computing net loss from continuing operations per share is as follows (in thousands, except per share amounts):

	December 31,		
	2019	2018	2017
	(in thousands, except share and per share amounts)		
Numerator:			
Net loss	$ (82,177)	$ (76,398)	$ (44,656)
Denominator:			
Weighted average number of shares outstanding—basic and diluted	43,624,807	28,269,907	3,197,516
Net loss per share—basic and diluted	$ (1.88)	$ (2.70)	$ (13.97)

Since the Company was in a loss position for all periods presented, basic net loss per common share is the same as diluted net loss per common share as the inclusion of all potential common shares outstanding would have been anti-dilutive. Potentially dilutive securities that were not included in the diluted per share calculations because they would be anti-dilutive were as follows:

	Year Ended December 31,		
	2019	2018	2017
Convertible preferred stock	—	—	28,159,724
Options to purchase common stock	6,906,898	5,500,531	4,365,694
Early exercised common stock subject to future vesting	146,915	704,028	831,439
Restricted stock accounted for as options	—	359,228	625,084
RSUs	325,887	—	—
Warrants to purchase convertible preferred stock	—	—	763,501
Warrants to purchase common stock	—	—	96,610
Shares subject to the 2018 ESPP	47,597	27,622	—
Total	7,427,297	6,591,409	34,842,052

Up to 640,218 shares may be contingently issued, if certain performance conditions are met under the Company's in-licensing agreements.

13. Defined Contribution Plan

The Company sponsors a 401(k) Plan that stipulates that eligible employees can elect to contribute to the 401(k) Plan, subject to certain limitations, on a pretax basis. The Company does not match any employee contributions. In January 2019, the Company began to match 4% of employees' salary.

14. Income Taxes

The Company has incurred net operating losses for all the periods presented. The Company has not reflected the benefit of any such net operating loss carryforwards in the accompanying financial statements. The Company has established a full valuation allowance against its deferred tax assets due to the uncertainty surrounding the realization of such assets. All losses to date have been incurred domestically as the Company has no international operations or subsidiaries.

No provision for U.S. income taxes exists due to tax losses incurred in all periods presented. All losses incurred were U.S. based.

The effective tax rate for the years ended December 31, 2019, 2018 and 2017 is different from the federal statutory rate primarily due to the valuation allowance against deferred tax assets as a result of insufficient sources of income. The effective tax rate of the Company's provision for income taxes differs from the federal statutory rate as follows:

	Year Ended December 31,		
	2019	2018	2017
Taxes at the U.S. statutory income tax rate	21.0 %	21.0 %	34.0 %
State tax, net of federal benefit	(2.2)	0.9	—
Other	(0.9)	(0.1)	(2.2)
Stock-based compensation	(0.5)	0.3	—
Research and development tax credits	(0.2)	1.0	—
Reduction to state net operating losses	(3.9)	—	—
Change in valuation allowance	(13.3)	(23.1)	(13.3)
Change in income tax rate due to Tax Act	—	—	(18.5)
Total provision for income taxes	— %	— %	— %

On December 22, 2017, the U.S. federal government enacted the Tax Cuts and Jobs Act (the “Tax Act”). The Tax Act contains, among other things, significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21% for tax years beginning after December 31, 2017, limitation of the deduction for net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, implementing a territorial tax system, and requiring a mandatory one-time tax on U.S. owned undistributed foreign earnings and profits known as the transition tax.

Pursuant to SAB 118, an entity may select between one of three scenarios to determine a reasonable estimate arising from the Tax Act. The scenarios are (i) a final estimate which effectively closes the measurement window; (ii) a reasonable estimate leaving the measurement window open for future revisions; and (iii) no estimate as the law is still being analyzed. The Company was able to provide a reasonable estimate for the revaluation of deferred taxes. As such, the Company recorded a $8.3 million reduction in deferred tax assets for the revaluation of deferred taxes in 2017 which was offset by a corresponding decrease to the Company’s full valuation allowance. The ultimate impact of the Act did not differ materially from provision amounts recorded. Adjustments, if any, would not have impacted the statement of operations and comprehensive loss due to the full valuation allowance on the Company’s deferred tax assets

Deferred income taxes reflect the net tax effects of (a) temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, and (b) operating losses and tax credit carryforwards.

The tax effects of significant items comprising the Company’s deferred tax assets are as follows:

	December 31,	
	2019	2018
	(in thousands)	
Deferred tax assets:		
Federal and state operating loss carryforwards	$ 40,435	$ 29,926
Research and development tax credits	3,436	3,865
Stock-based compensation	3,514	1,839
Accruals and other	1,473	1,040
Contingent consideration	670	954
Charitable contributions	253	253
Total deferred tax assets	49,781	37,877
Deferred tax liabilities:		
Unrealized gain on equity investment	(947)	—
Total deferred tax liabilities	(947)	—
Valuation allowance	(48,834)	(37,877)
Net deferred tax assets	$ —	$ —

The tax benefit of net operating losses, temporary differences and credit carryforwards should be recorded as an asset to the extent that management assesses that their realization is "more likely than not." Realization of the future tax benefits is dependent on the Company's ability to generate sufficient taxable income within the carryforward period. Because of the Company's recent history of operating losses, management believes that recognition of the deferred tax assets arising from the above-mentioned future tax benefits is currently not likely to be realized and, accordingly, has provided a valuation allowance.

Realization of the net deferred tax assets is dependent upon future taxable income, if any, the amount and timing of which is uncertain. Based on the weight of available positive and negative objective evidence, management believes it more likely than not that the Company’s deferred tax assets are not realizable. Accordingly, the net deferred tax assets have been fully offset by a valuation allowance. The valuation allowance increased by $11.0 million, $17.6 million and $9.4 million during the years ended December 31, 2019, 2018 and 2017, respectively.

Net operating losses and tax credit carryforwards as of December 31, 2019 are as follows:

	Amount	Expiration Years
Net operating losses, federal (post December 31, 2017)	$ 137,097	Do Not Expire
Net operating losses, federal (pre January 1, 2018)	64,136	2030 - 2037
Net operating losses, state	26,123	2030 - 2036
Research and development tax credits, federal	5,931	2031 - 2039
Research and development tax credits, state	5,216	Indefinite

Federal and state laws impose restrictions on the utilization of net operating loss carryforwards and R&D credit carryforwards in the event of a change in ownership of the Company, which constitutes an 'ownership change' as defined by Internal Revenue Code Section 382 and 383. The Company experienced an ownership change in the past that impacts the availability of its net operating losses and tax credits. The amounts indicated in the above tables reflect the reduction of net operating losses and credit carryforwards as a result of previous ownership changes that the Company experienced. Should there be additional ownership changes in the future, the Company's ability to utilize existing carryforwards could be substantially restricted.

The Company determines its uncertain tax positions based on a determination of whether and how much of a tax benefit taken by the Company in its tax filings is more likely than not to be sustained upon examination by the relevant income tax authorities.

As of December 31, 2019, the Company has no accrued interest or penalties related to uncertain tax positions.

The following table summarizes the activity related to our unrecognized tax benefits:

	December 31,	
	2019	2018
	(in thousands)	
Gross unrecognized tax benefits at January 1	$ 3,714	$ 3,065
Additions for tax positions taken in the current year	6,221	753
Reductions for tax positions taken in the prior year	(173)	(104)
Gross unrecognized tax benefits at December 31	$ 9,762	$ 3,714

If recognized, none of the unrecognized tax benefits as of December 31, 2019 and 2018 would reduce the annual effective tax rate, primarily due to corresponding adjustments to the valuation allowance. The Company will recognize both accrued interest and penalties related to unrecognized benefits in income tax expense. As of December 31, 2019 and 2018, no liability has been recorded for potential interest or penalties. The Company does not expect the unrecognized tax benefits to change significantly over the next 12 months.

The Company files income tax returns in the U.S. federal jurisdiction and California, Colorado and Delaware. The Company is not currently under audit by the Internal Revenue Service or other similar state or local authorities. All tax years remain open to examination by major taxing jurisdictions to which the Company is subject.

15. Selected Quarterly Financial Data (Unaudited)

The following tables show a summary of the Company’s quarterly financial information for each of the four quarters of 2019 and 2018 and have been prepared in accordance with GAAP for interim financial reporting (in thousands, except for per share data):

	Quarter			
Year Ended December 31, 2019	First	Second	Third	Fourth
Loss from operations	$ (19,737)	$ (24,470)	$ (22,354)	$ (23,090)
Net loss	$ (18,767)	$ (23,673)	$ (21,710)	$ (18,027)
Net loss per common share, basic and diluted	$ (0.44)	$ (0.56)	$ (0.51)	$ (0.39)

Year Ended December 31, 2018	Quarter			
	First	Second	Third	Fourth
Loss from operations	$ (16,482)	$ (20,798)	$ (19,377)	$ (22,808)
Net loss	$ (16,133)	$ (20,002)	$ (18,346)	$ (21,917)
Net loss per common share, basic and diluted	$ (4.69)	$ (0.76)	$ (0.45)	$ (0.53)

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our chief executive and financial officers, evaluated the effectiveness of our disclosures controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, as of December 31, 2019. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate, to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of December 31, 2019, our chief executive officer and chief financial officer concluded that, as of such date, our disclosure controls and procedures were effective at a reasonable assurance level.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) under the Securities Exchange Act of 1934. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles in the United States and includes those policies and procedures that:

- Pertain to the maintenance of records that accurately and fairly reflect in reasonable detail the transactions and dispositions of the assets of our company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- Provide reasonable assurances regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material adverse effect on our financial statements.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2019. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013 framework). Based on our assessment, management concluded our internal control over financial reporting was effective as of December 31, 2019, based on the COSO criteria.

Attestation Report of the Registered Public Accounting Firm

This Annual Report on Form 10-K does not include an attestation report of our registered public accounting firm due to an exemption established by the JOBS Act for "emerging growth companies."

Changes in Internal Control over Financial Reporting

Management determined that, as of December 31, 2019, there were no changes in our internal control over financial reporting that occurred during the fiscal quarter then ended that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Controls and Procedures

In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Item 9B. Other Information.

On March 9, 2020, we entered into amendments to the employment agreements with each of our executive officers (other than Mr. Leonard). The amendment provides each executive officer with the following benefits:

- In the event s/he is terminated by the Company without “cause” or resigns for “good reason” (each, as defined in the employment agreement) outside of a period of time that begins three months prior to and ends 18 months following a change in control, then s/he will be entitled to receive: (i) continued base salary for 9 months following the date of termination; and (ii) payment or reimbursement of continued healthcare coverage for up to 9 months following the date of termination, subject to his/her execution and delivery of a release of claims against the Company; and
- In the event s/he is terminated without cause or resigns for good reason, during a period of time that begins three months prior to and ends 18 months following a change in control, then s/he will be eligible to receive: (i) a lump sum severance payment equal to his/her annual base salary and target annual incentive payment; (ii) payment or reimbursement of continued healthcare coverage for up to 12 months following the date of termination; and (iii) full acceleration of his/her equity awards, subject to his execution and delivery of a release of claims against the Company.

The foregoing description of the terms of the employment agreement amendments is qualified in its entirety by the full amendment and agreements filed as exhibits to the Annual Report on Form 10-K.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Information required by this Item is incorporated herein by reference to the sections titled “Executive Officers,” “Election of Directors,” “Corporate Governance” and “Section 16(a) Beneficial Ownership and Reporting Compliance” in our Definitive Proxy Statement with respect to our 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

Item 11. Executive Compensation.

Information required by this Item is incorporated herein by reference to the section titled “Executive Compensation,” “Director Compensation” and “Corporate Governance” in our Definitive Proxy Statement with respect to our 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

Information required by this Item is incorporated herein by reference to the section titled “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information” in our Definitive Proxy Statement with respect to our 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

Information required by this Item is incorporated herein by reference to the section titled “Certain Relationships and Related Party Transactions” and “Corporate Governance” in our Definitive Proxy Statement with respect to our 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

Item 14. Principal Accounting Fees and Services.

Information required by this Item is incorporated herein by reference to the section titled “Ratification of Selection of Independent Registered Public Accounting Firm” in our Definitive Proxy Statement with respect to our 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) The following documents are filed as part of this report:

1. Financial Statements

See Index to Financial Statements in Part II Item 8 of this Annual Report on Form 10-K.

2. Financial Statement Schedules

All schedules are omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

3. Exhibits

Exhibit Index

Exhibit Number	Description	Incorporated by Reference			Filed Herewith
		Form	Number	Filing Date	
3.1	Amended and Restated Certificate of Incorporation of Unity Biotechnology, Inc.	8-K	3.1	5-7-18	
3.2	Amended and Restated Bylaws of Unity Biotechnology, Inc.	8-K	3.2	5-7-18	
4.1	Reference is made to exhibits 3.1 through 3.2.				
4.2	Form of Common Stock Certificate.	S-1	4.2	4-23-18	
4.3	Amended and Restated Investors' Rights Agreement, dated as of March 15, 2018, by and among Unity Biotechnology, Inc. and the investors party thereto.	S-1	4.3	4-5-18	
4.4	Description of Unity's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934.				X
10.1(a)	Lease Agreement, dated as of May 13, 2016, by and between Unity Biotechnology, Inc. and BMR-Bayshore Boulevard L.P.	S-1	10.1(a)	4-5-18	
10.1(b)	First Amendment to Lease Agreement, dated as of May 23, 2017, by and between Unity Biotechnology, Inc. and BMR-Bayshore Boulevard L.P.	S-1	10.1(b)	4-5-18	
10.2(a)	Space License Agreement, dated as of October 20, 2016, by and between Unity Biotechnology, Inc. and BMR-Bayshore Boulevard L.P.	S-1	10.2(a)	4-5-18	
10.2(b)	First Amendment to Space License Agreement, dated as of December 5, 2016, by and between Unity Biotechnology, Inc. and BMR-Bayshore Boulevard L.P.	S-1	10.2(b)	4-5-18	
10.2(c)	Second Amendment to Space License Agreement, dated as of January 30, 2017, by and between Unity Biotechnology, Inc. and BMR-Bayshore Boulevard L.P.	S-1	10.2(c)	4-5-18	
10.3(a)#	2013 Equity Incentive Plan.	S-1	10.3(a)	4-5-18	
10.3(b)#	Form of Stock Option Agreement under 2013 Equity Incentive Plan.	S-1	10.3(b)	4-5-18	
10.4(a)#	2018 Incentive Award Plan.	S-1	10.4(a)	4-23-18	
10.4(b)#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2018 Incentive Award Plan.	S-1	10.4(b)	4-5-18	
10.4(c)#	Form of Restricted Stock Award Grant Notice and Restricted Stock Award Agreement under the 2018 Incentive Award Plan.	S-1	10.4(c)	4-5-18	
10.4(d)#	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under the 2018 Incentive Award Plan.	S-1	10.4(d)	4-5-18	
10.5#	2018 Employee Stock Purchase Plan.	S-1	10.5	4-23-18	
10.6#	Amended and Restated Non-Employee Director Compensation Program (Effective January 1, 2019)	10-K	10.6	3-6-19	
10.7#	Form of Indemnification Agreement for directors and officers.	S-1	10.7	4-5-18	
10.8#	Employment Agreement, dated January 29, 2018, by and between Unity Biotechnology, Inc. and Keith R. Leonard Jr.	S-1	10.8	4-5-18	
10.9#	Employment Agreement, dated January 29, 2018, by and between Unity Biotechnology, Inc. and Nathaniel E. David.	S-1	10.9	4-5-18	
10.10#	Employment Agreement, dated January 29, 2018, by and between Unity Biotechnology, Inc. and Robert C. Goeltz II.	S-1	10.10	4-5-18	
10.11#	Employment Agreement, dated January 29, 2018, by and between Unity Biotechnology, Inc. and Jamie Dananberg.	S-1	10.11	4-5-18	
10.12#	Employment Agreement, dated January 29, 2018, by and between Unity Biotechnology, Inc. and Daniel G. Marquess.	S-1	10.12	4-5-18	

10.13#	Employment Agreement, dated January 29, 2018, by and between Unity Biotechnology, Inc. and Tamara L. Tompkins.	S-1	10.13	4-5-18
10.14†	Compound Library and Option Agreement, dated as of February 2, 2016, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	S-1	10.14	4-23-18
10.15†	APG1252 License Agreement, dated as of February 2, 2016, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	S-1	10.15	4-23-18
10.16†	Research Services Agreement, dated as of February 2, 2016, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	S-1	10.16	4-5-18
10.17†	Amendment to APG1252 License Agreement, dated as of February 2, 2016, by and between Ascentage Pharma Group Corp. Ltd.	S-1	10.17	4-5-18
10.18†	Amendment to Compound Library and Option Agreement, dated as of February 2, 2016, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	S-1	10.18	4-5-18
10.19(a)†	Exclusive License Agreement, dated as of June 28, 2013, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(a)	4-23-18
10.19(b)†	Amendment No. 1 to Exclusive License Agreement, dated as of September 10, 2014, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(b)	4-23-18
10.19(c)†	Amendment No. 2 to Exclusive License Agreement, dated as of November 17, 2014, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(c)	4-23-18
10.19(d)†	Amendment No. 3 to Exclusive License Agreement, dated as of May 5, 2015, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(d)	4-23-18
10.19(e)†	Amendment No. 4 to Exclusive License Agreement, dated as of September 15, 2016, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(e)	4-23-18
10.19(f)†	Addendum to Amendment No. 4 to Exclusive License Agreement, dated as of September 15, 2016, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(f)	4-23-18
10.19(g)†	Amendment No. 5 to Exclusive License Agreement, dated as of October 17, 2016, by and between the Mayo Foundation for Medical Education and Research and Unity Biotechnology, Inc.	S-1	10.19(g)	4-23-18
10.20†	Amended and Restated License Agreement, dated as of January 27, 2017, by and between the Buck Institute for Research on Aging and Unity Biotechnology, Inc.	S-1	10.20	4-23-18
10.21†	License Agreement, dated as of November 3, 2016, by and between The Johns Hopkins University and Unity Biotechnology, Inc.	S-1	10.21	4-23-18
10.22††	License Agreement for APG1197, dated as of January 2, 2019, by and between Ascentage Pharma Group Corp. Ltd. And Unity Biotechnology, Inc.	10-K	10.22	3-6-19
10.23	Lease Agreement, dated as of February 28, 2019, by and between Unity Biotechnology, Inc. and Bayside Area Development, LLC	10-K	10.23	3-6-19
10.24††††	First Amendment to Compound License Agreement for APG1197, dated as of November 19, 2019, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	8-K	10.1	11-25-19

10.25†††	Second Amendment to APG1252 License Agreement, dated as of November 19, 2019, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	X
10.26††††	Second Amendment to Compound Library and Option Agreement, dated as of January 8, 2020, by and between Ascentage Pharma Group Corp. Ltd. and Unity Biotechnology, Inc.	X
10.27#	Amendment to Employment Agreement, dated March 9, 2020, by and between Unity Biotechnology, Inc. and Nathaniel E. David.	X
10.28#	Amendment to Employment Agreement, dated March 9, 2020, by and between Unity Biotechnology, Inc. and Robert C. Goeltz II.	X
10.29#	Amendment to Employment Agreement, dated March 9, 2020, by and between Unity Biotechnology, Inc. and Jamie Dananberg.	X
10.30#	Amendment to Employment Agreement, dated March 9, 2020, by and between Unity Biotechnology, Inc. and Daniel G. Marquess.	X
10.31#	Amendment to Employment Agreement, dated March 9, 2020, by and between Unity Biotechnology, Inc. and Tamara L. Tompkins.	X
23.1	Consent of Independent Registered Public Accounting Firm	X
24.1	Power of Attorney. Reference is made to the signature page.	X
31.1	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X
31.2	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X
32.1**	Certification of Principal Executive Officer and Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
101.INS	XBRL Instance Document	X
101.SCH	XBRL Taxonomy Extension Schema Document	X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	X

† Confidential treatment has been granted for certain information contained in this exhibit. Such information has been omitted and filed separately with the Securities and Exchange Commission.

†† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment filed separately with the Securities and Exchange Commission.

††† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to Regulation S-K, Item 601(b)(10). Such omitted information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

†††† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to Regulation S-K, Item 601(b)(10). Such omitted information is not material and would likely cause competitive harm to the registrant if publicly disclosed. Additionally, schedules and attachments to this exhibit have been omitted pursuant to Regulation S-K, Item 601(a)(5).

# Indicates management contract or compensatory plan.

** The certification attached as Exhibit 32.1 that accompanies this Annual Report on Form 10-K is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Unity Biotechnology, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Annual Report on Form 10-K, irrespective of any general incorporation language contained in such filing.

Item 16. Form 10-K Summary.

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized**.**

Unity Biotechnology, Inc.

Date: March 11, 2020

By: /s/ Keith R. Leonard Jr.
Keith R. Leonard Jr.
Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints each of Keith R. Leonard, Robert C. Goeltz II and Tamara L. Tompkins his or her true and lawful attorney-in-fact and agent, with full power of substitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the U.S. 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 requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming that all said attorneys-in-fact and agents, or their, his or her substitutes or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ Keith R. Leonard Jr. **Keith R. Leonard Jr.**	Chairman, Chief Executive Officer and Director (Principal Executive Officer)	March 11, 2020
/s/ Robert C. Goeltz II **Robert C. Goeltz II**	Chief Financial Officer (Principal Financial and Accounting Officer)	March 11, 2020
/s/ Paul L. Berns **Paul L. Berns**	Director	March 11, 2020
/s/ Kristina M. Burow **Kristina M. Burow**	Director	March 11, 2020
/s/ Graham K. Cooper **Graham K. Cooper**	Director	March 11, 2020
/s/ Nathaniel E. David **Nathaniel E. David**	President and Director	March 11, 2020
/s/ David L. Lacey **David L. Lacey**	Director	March 11, 2020
/s/ Robert T. Nelsen **Robert T. Nelsen**	Director	March 11, 2020
/s/ Margo Roberts **Margo Roberts**	Director	March 11, 2020
/s/ Camille D. Samuels **Camille D. Samuels**	Director	March 11, 2020

DESCRIPTION OF UNITY'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

As of December 31, 2019, Unity Biotechnology, Inc. ("UBX") had common stock, $0.0001 par value per share, registered under Section 12 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and listed on The Nasdaq Global Select Market under the trading symbol "UBX."

DESCRIPTION OF COMMON STOCK

The following description of our capital stock is a summary. This summary is subject to the General Corporation Law of the State of Delaware (the "DGCL") and the complete text of our amended and restated certificate of incorporation (the "certificate of incorporation") and amended and restated bylaws (the "bylaws") are summaries of material terms and provisions and are qualified by reference to our certificate of incorporation and bylaws, filed as Exhibits 3.1 and 3.2, respectively, to UBX's Annual Report on Form 10-K. We encourage you to read that law and those documents carefully.

Common Stock

General

Our authorized capital stock consists of 300,000,000 shares of common stock, $0.0001 par value per share.

Voting Rights

Each holder of our common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, including the election of directors. Our stockholders do not have cumulative voting rights in the election of directors. Accordingly, holders of a majority of the voting shares are able to elect all of the directors. In addition, the affirmative vote of holders of sixty-six and two-thirds percent (66 2/3%) of the voting power of all of the then outstanding voting stock is required to take certain actions, including amending certain provisions of our amended and restated certificate of incorporation, such as the provisions relating to amending our amended and restated bylaws, the classified board and director liability.

Dividends

Subject to preferences that may be applicable to any then outstanding preferred stock, holders of our common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of legally available funds.

Liquidation

In the event of our liquidation, dissolution or winding up, holders of our common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then outstanding shares of preferred stock.

Rights and Preferences

Holders of our common stock have no preemptive, conversion, subscription or other rights, and there are no redemption or sinking fund provisions applicable to our common stock. The rights, preferences and privileges of the holders of our common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of our preferred stock that we may designate in the future.

Anti-Takeover Effects of Provisions

Certain provisions of Delaware law and our certificate of incorporation and bylaws contain provisions that could make the following transactions more difficult: acquisition of us by means of a tender offer; acquisition of us by means of a proxy contest or otherwise; or removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interests, including transactions that might result in a premium over the market price for our shares.

These provisions, summarized below, are expected to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of increased protection of our potential ability to

negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Delaware Anti-Takeover Statute

We are subject to Section 203 of the DGCL, which prohibits persons deemed "interested stockholders" from engaging in a "business combination" with a publicly-held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an "interested stockholder" is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation's voting stock. Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors, such as discouraging takeover attempts that might result in a premium over the market price of our common stock.

Undesignated Preferred Stock

Under our certificate of incorporation, our board of directors has the authority, without further action by our stockholders, to designate and issue up to 10,000,000 shares of preferred stock, par value $0.0001 per share, in one or more series and to fix the rights, preferences, privileges and restrictions thereof. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, terms of redemption, liquidation preferences, sinking fund terms and the number of shares constituting, or the designation of, such series, any or all of which may be greater than the rights of our common stock. The issuance of our preferred stock could adversely affect the voting power of holders of common stock and the likelihood that such holders will receive dividend payments and payments upon our liquidation. The ability to authorize undesignated preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change control of us. These and other provisions may have the effect of deterring hostile takeovers or delaying changes in control or management of our company.

Special Stockholder Meetings

Our bylaws provide that a special meeting of stockholders may be called at any time by our board of directors, or our President or Chief Executive Officer or President (in the absence of a Chief Executive Officer), but such special meetings may not be called by the stockholders or any other person or persons.

Classified Board; Election and Removal of Directors; Filling Vacancies

Our board of directors is divided into three classes. The directors in each class serve for a three-year term, with one class being elected each year by our stockholders, with staggered three-year terms. Only one class of directors will be elected at each annual meeting of our stockholders, with the other classes continuing for the remainder of their respective three-year terms. Because our stockholders do not have cumulative voting rights, our stockholders holding a majority of the shares of common stock outstanding will be able to elect all of our directors. Furthermore, the size of the board of directors shall be determined from time to time exclusively by the board of directors pursuant to a resolution adopted by the board of directors, provided the board of directors may not consist of fewer than one member. Our certificate of incorporation provides for the removal of any of our directors only for cause and requires a stockholder vote by the holders of at least sixty-six and two-thirds percent (66 2/3%) of the voting power of the then outstanding shares of voting stock. Furthermore, any vacancy on our board of directors, including a vacancy resulting from an increase in the size of the board, may be filled only by a majority vote of the board of directors then in office, although less than a quorum, or by a sole remaining director. This system of electing and removing directors and filling vacancies may tend to discourage a third party from making a tender offer or otherwise attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

Amendment of the Certificate of Incorporation and Bylaws

The amendment of any of the above provisions in our certificate of incorporation, except for the provision making it possible for our board of directors to issue undesignated preferred stock, would require approval by holders of at least sixty-six and two-thirds percent (66 2/3%) of the voting power of the then outstanding voting stock, voting together as a single class. Subject to limitations set forth in the bylaws or the certificate of incorporation, the board is expressly empowered to adopt, amend or repeal the bylaws. Stockholders shall have the power to amend the bylaws

provided that any such amendment would require approval by holders of at least sixty-six and two-thirds percent (66 2/3%) of the voting power of the then outstanding voting stock, voting together as a single class.

The provisions of the DGCL, our certificate of incorporation and bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions may 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 may otherwise deem to be in their best interests.

Limitations of Liability and Indemnification Matters

Our certificate of incorporation contains provisions that limit the liability of our directors for monetary damages to the fullest extent permitted by Delaware law. Consequently, our directors will not be personally liable to us or our stockholders for monetary damages for any breach of fiduciary duties as directors, except liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the DGCL; or
- any transaction from which the director derived an improper personal benefit.

Each of our certificate of incorporation and bylaws provides that we are required to indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law. Our bylaws also obligate us to advance expenses incurred by a director or officer in advance of the final disposition of any action or proceeding, and permit us to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in that capacity regardless of whether we would otherwise be permitted to indemnify him or her under Delaware law. We have entered and expect to continue to enter into agreements to indemnify our directors, executive officers and other employees as determined by our board of directors. With specified exceptions, these agreements provide for indemnification for related expenses including, among other things, attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding. We believe that these bylaw provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers. We also maintain directors' and officers' liability insurance.

The limitation of liability and indemnification provisions in our certificate of incorporation and bylaws may discourage stockholders from bringing a lawsuit against our directors and officers for breach of their fiduciary duty. They may also reduce the likelihood of derivative litigation against our directors and officers, even though an action, if successful, might benefit us and our stockholders. Further, a stockholder's investment may be adversely affected to the extent that we pay the costs of settlement and damages.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. The transfer agent and registrar's address is 480 Washington Boulevard, 29th Floor, Jersey City, New Jersey 07130.

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item 601(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed.

SECOND AMENDMENT TO APG1252 LICENSE AGREEMENT

This Amendment (the "Second Amendment"), dated as of November 19, 2019 (the "Second Amendment Effective Date") is made by and between Ascentage Pharma Group Corp. Ltd., a Hong Kong corporation ("Ascentage"), with a business address at 11/F, AXA CENTRE, Gloucester Road, Wanchai, Hong Kong, and Unity Biotechnology, Inc., a Delaware corporation ("Unity"), with a business address at 3280 Bayshore Blvd, Suite 100, Brisbane, California 95002. Ascentage and Unity are sometimes referred to herein as individually as a "Party" and collectively as the "Parties".

BACKGROUND

Ascentage and Unity are parties to that certain APG1252 License Agreement dated February 2, 2016, which was amended by a First Amendment dated March 28, 2018 (as amended, the "1252 License Agreement") pursuant to which Ascentage granted Unity exclusive rights to a BCL Compound known as APG-1252 for the prophylaxis and treatment of, and palliation of symptoms associated with, age related indications other than Oncology Indications.

The Parties now wish to further amend the 1252 License Agreement. Except as expressly modified hereby, the 1252 License Agreement shall continue in full force according to its terms.

NOW, THEREFORE, for and in consideration of the covenants, conditions and undertakings hereinafter set forth, it is agreed by and between the Parties as follows:

AGREEMENT

1. Diligence Milestone. The time period associated with the first milestone set forth in the table in Section 3.2 ("[***]") shall be amended to read as set forth below (amended text set is forth in italics):

Milestone	**Time Period**
1. [***]	[***]
2. [***]	Within [***] ([***]) [***] of the Effective Date
3. [***]	Within [***] ([***]) [***] of the Effective Date
4. [***]	Within [***] ([***]) [***] of the Effective Date

2. Miscellaneous. This Amendment shall inure to the benefit of and be binding upon the parties and their respective heirs, successors, trustees, transferees and assigns. In the event of a conflict between the provisions of this Amendment and the provisions of the Library Agreement, the provisions of this Amendment shall control. This Amendment may be executed in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have caused this Second Amendment to be duly executed by their authorized representatives and delivered in duplicate originals as of the Second Amendment Effective Date.

ASCENTAGE PHARMA GROUP CORP. LTD. **UNITY BIOTECHNOLOGY, INC.**

By: /s/ Dajun Yang, MD, PhD By: /s/ Keith Leonard

Name: Dajun Yang, MD, PhD Name: Keith Leonard

Title: Chief Executive Officer Title: Chief Executive Officer

[***] Certain information in this document has been excluded pursuant to Regulation S-K, Item 601(b)(10). Such excluded information is not material and would likely cause competitive harm to the registrant if publicly disclosed. Additionally, schedules and attachments to this exhibit have been omitted pursuant to Regulation S-K, Item 601(a)(5).

SECOND AMENDMENT TO COMPOUND LICENSE AGREEMENT FOR APG-1197

This second amendment (the "Second Amendment"), dated as of January 8, 2020 (the "Amendment Effective Date") is made by and between Ascentage Pharma Group Corp. Ltd., a Hong Kong corporation ("Ascentage"), with a business address at 11/F, AXA CENTRE, Gloucester Road, Wanchai, Hong Kong, and Unity Biotechnology, Inc., a Delaware corporation ("Unity"), with a business address at 3280 Bayshore Blvd, Suite 100, Brisbane, California 95002. Ascentage and Unity are sometimes referred to herein as individually as a "Party" and collectively as the "Parties."

BACKGROUND

Ascentage and Unity are parties to that certain Compound License Agreement for APG1197 dated January 2, 2019, (the "Original APG-1197 License Agreement") pursuant to which Ascentage granted Unity exclusive rights to a BCL Compound known as APG-1197 for the prophylaxis and treatment of, and palliation of symptoms associated with, age related indications other than Oncology Indications.

The Parties amended the Original APG-1197 License Agreement on November 19, 2019 to reflect certain updates to the Licensed Patents. The Parties now wish to further amend the Original APG-1197 License Agreement to update the descriptions of the Licensed Patents. Except as expressly modified hereby, the Original APG-1197 License Agreement shall continue in full force according to its terms.

NOW, THEREFORE, for and in consideration of the covenants, conditions and undertakings hereinafter set forth, it is agreed by and between the Parties as follows:

AGREEMENT

1. Exclusivity with Respect to Licensed Compound. Section 2.5 shall be amended and restated in its entirety to read as follows:

> "Ascentage hereby covenants that except as expressly permitted under any future agreement that the Parties may enter into pursuant to Article 9 below pertaining to the China JVCO, Ascentage shall not: (a) research, develop, use or commercialize, and shall not authorize any Affiliate or other Third Party to research, develop, use or commercialize, the Licensed Compound or any Licensed Product, or (b) manufacture, or authorize any Third Party to manufacture, the Licensed Compound or any Licensed Product."

2. Licensed Patents. Schedule 1.5 ("Licensed Patents") shall be amended and restated in its entirety as set forth on Exhibit A hereto.

3. Miscellaneous. This Second Amendment shall inure to the benefit of and be binding upon the parties and their respective heirs, successors, trustees, transferees and assigns. In the event of a conflict between the provisions of this Second Amendment and the provisions of the Original APG-1197 License Agreement or that Compound Library and Option Agreement by and between the Parties dated February 22, 2016, as amended on March 28, 2018, the provisions of this Second Amendment shall control. This Second Amendment may be executed in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have caused this Second Amendment to be duly executed by their authorized representatives and delivered in duplicate originals as of the Second Amendment Effective Date.

ASCENTAGE PHARMA GROUP CORP. LTD. **UNITY BIOTECHNOLOGY, INC.**

By: /s/ Dajun Yang, MD, PhD By: /s/ Keith Leonard

Name: Dajun Yang, MD, PhD Name: Keith Leonard

Title: Chief Executive Officer Title: Chief Executive Officer

EXHIBIT A

SCHEDULE 1.15

LICENSED PATENTS

(as may be amended from time to time)

Omitted pursuant to Regulation S-K, Item 601(a)(5)

UNITY BIOTECHNOLOGY, INC.

AMENDMENT TO
EMPLOYMENT AGREEMENT

THIS AMENDMENT TO EMPLOYMENT AGREEMENT (this "Amendment") is made and entered into effective as of March 9, 2020 (the "Effective Date"), by and between Unity Biotechnology, Inc., a Delaware corporation ("Company") and Nathaniel E. David ("Executive").

WHEREAS, the Company and Executive are parties to that certain Employment Agreement dated as of January 29, 2018 (the "Agreement"), which sets forth the terms of Executive's employment with the Company;

WHEREAS, the Company and Executive desire to amend the Agreement, as set forth herein.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and conditions herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and Executive hereby agree as follows, effective as of the Effective Date.

1. The reference to "Section 6(b)(iii)" in the last sentence of Section 4(c) of the Agreement is hereby deleted and replaced with "Section 6(b)(ii)(C)".

2. Section 6(b) of the Agreement is hereby deleted and replaced in its entirety with the following:

"(b) Severance Payments upon Termination Without Cause or For Good Reason.

(i) Termination Other than During a Change in Control Period. If, during the Term of Employment but outside the period beginning three months prior to and ending 18 months following a Change in Control (such period, a "Change in Control Period"), Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a waiver and release of claims agreement in a form approved by the Company that becomes effective and irrevocable in accordance with Section 11(d) hereof (a "Release"):

(A) During the nine-month period commencing on the Date of Termination (the "Severance Period"), the Company shall continue to pay Executive the Executive's Annual Base Salary, such payment to be made in accordance with the Company's regular payroll procedures, with the first such installment to occur on the first payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof and inclusive of any installments that would have been made had the Release been immediately effective and irrevocable.

(B) During the period commencing on the Date of Termination and ending on the last day of the Severance Period or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Internal Revenue Code of 1986, as amended (the "Code") and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; provided, however, that if (1) any plan

pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the COBRA Period (or remaining portion thereof).

(ii) Termination During a Change in Control Period. If, during the Term of Employment and during a Change in Control Period, Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a Release that becomes effective and irrevocable in accordance with Section 11(d) hereof:

(A) The Company shall pay to Executive an amount equal to the sum of (i) Executive's Annual Base Salary and (ii) Executive's target Annual Bonus. Such amount will be subject to applicable withholdings and payable in a single lump sum cash payment on the first regular payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof.

(B) During the period commencing on the Date of Termination and ending on the first anniversary thereof or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "CiC COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Code and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; *provided*, *however*, that if (1) any plan pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the CiC COBRA Period (or remaining portion thereof).

(C) The Company shall cause any unvested equity awards, including any stock options, restricted stock awards and any such awards subject to performance-based vesting, held by Executive as of the Date of Termination, to become fully vested and, if applicable, exercisable, and cause all restrictions and rights of repurchase on such awards to lapse with respect to all of the shares of the Company's Common Stock subject thereto."

3. **Counterparts**. This Amendment may be executed in one or more facsimile, electronic or original counterparts, each of which shall be deemed an original and both of which together shall constitute the same instrument.

4. **Ratification**. All terms and provisions of the Agreement not amended hereby, either expressly or by necessary implication, shall remain in full force and effect. The Agreement, as hereby amended, and any attachments thereto, constitute the entire agreement between the parties with respect to

their subject matter and supersede all prior agreements, arrangements, dealings or writings between the parties, and from and after the date of this Amendment, all references to the term "Agreement" in this Amendment or the original Agreement shall include the terms contained in this Amendment.

IN WITNESS WHEREOF, this Amendment to Employment Agreement has been duly executed by or on behalf of the parties hereto as of the Effective Date.

UNITY BIOTECHNOLOGY, INC.

By:/s/ Keith R. Leonard Jr.
Name: Keith R. Leonard Jr.
Title: Chief Executive Officer

EXECUTIVE

By:/s/ Nathaniel E. David
Name: Nathaniel E. David

UNITY BIOTECHNOLOGY, INC.

AMENDMENT TO
EMPLOYMENT AGREEMENT

THIS AMENDMENT TO EMPLOYMENT AGREEMENT (this "Amendment") is made and entered into effective as of March 9, 2020 (the "Effective Date"), by and between Unity Biotechnology, Inc., a Delaware corporation ("Company") and Robert C. Goeltz II ("Executive").

WHEREAS, the Company and Executive are parties to that certain Employment Agreement dated as of January 29, 2018 (the "Agreement"), which sets forth the terms of Executive's employment with the Company;

WHEREAS, the Company and Executive desire to amend the Agreement, as set forth herein.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and conditions herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and Executive hereby agree as follows, effective as of the Effective Date.

1. The reference to "Section 6(b)(iii)" in the last sentence of Section 4(c) of the Agreement is hereby deleted and replaced with "Section 6(b)(ii)(C)".

2. Section 6(b) of the Agreement is hereby deleted and replaced in its entirety with the following:

"(b) Severance Payments upon Termination Without Cause or For Good Reason.

(i) Termination Other than During a Change in Control Period. If, during the Term of Employment but outside the period beginning three months prior to and ending 18 months following a Change in Control (such period, a "Change in Control Period"), Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a waiver and release of claims agreement in a form approved by the Company that becomes effective and irrevocable in accordance with Section 11(d) hereof (a "Release"):

(A) During the nine-month period commencing on the Date of Termination (the "Severance Period"), the Company shall continue to pay Executive the Executive's Annual Base Salary, such payment to be made in accordance with the Company's regular payroll procedures, with the first such installment to occur on the first payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof and inclusive of any installments that would have been made had the Release been immediately effective and irrevocable.

(B) During the period commencing on the Date of Termination and ending on the last day of the Severance Period or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Internal Revenue Code of 1986, as amended (the "Code") and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; provided, however, that if (1) any plan

pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the COBRA Period (or remaining portion thereof).

(ii) Termination During a Change in Control Period. If, during the Term of Employment and during a Change in Control Period, Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a Release that becomes effective and irrevocable in accordance with Section 11(d) hereof:

(A) The Company shall pay to Executive an amount equal to the sum of (i) Executive's Annual Base Salary and (ii) Executive's target Annual Bonus. Such amount will be subject to applicable withholdings and payable in a single lump sum cash payment on the first regular payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof.

(B) During the period commencing on the Date of Termination and ending on the first anniversary thereof or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "CiC COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Code and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; *provided*, *however*, that if (1) any plan pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the CiC COBRA Period (or remaining portion thereof).

(C) The Company shall cause any unvested equity awards, including any stock options, restricted stock awards and any such awards subject to performance-based vesting, held by Executive as of the Date of Termination, to become fully vested and, if applicable, exercisable, and cause all restrictions and rights of repurchase on such awards to lapse with respect to all of the shares of the Company's Common Stock subject thereto."

3. **Counterparts**. This Amendment may be executed in one or more facsimile, electronic or original counterparts, each of which shall be deemed an original and both of which together shall constitute the same instrument.

4. **Ratification**. All terms and provisions of the Agreement not amended hereby, either expressly or by necessary implication, shall remain in full force and effect. The Agreement, as hereby amended, and any attachments thereto, constitute the entire agreement between the parties with respect to

their subject matter and supersede all prior agreements, arrangements, dealings or writings between the parties, and from and after the date of this Amendment, all references to the term "Agreement" in this Amendment or the original Agreement shall include the terms contained in this Amendment.

IN WITNESS WHEREOF, this Amendment to Employment Agreement has been duly executed by or on behalf of the parties hereto as of the Effective Date.

UNITY BIOTECHNOLOGY, INC.

By:/s/ Keith R. Leonard Jr.
Name: Keith R. Leonard Jr.
Title: Chief Executive Officer

EXECUTIVE

By:/s/ Robert C. Goeltz II
Name: Robert C. Goeltz II

UNITY BIOTECHNOLOGY, INC.

AMENDMENT TO
EMPLOYMENT AGREEMENT

THIS AMENDMENT TO EMPLOYMENT AGREEMENT (this "Amendment") is made and entered into effective as of March 9, 2020 (the "Effective Date"), by and between Unity Biotechnology, Inc., a Delaware corporation ("Company") and Jamie Dananberg ("Executive").

WHEREAS, the Company and Executive are parties to that certain Employment Agreement dated as of January 29, 2018 (the "Agreement"), which sets forth the terms of Executive's employment with the Company;

WHEREAS, the Company and Executive desire to amend the Agreement, as set forth herein.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and conditions herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and Executive hereby agree as follows, effective as of the Effective Date.

1. The reference to "Section 6(b)(iii)" in the last sentence of Section 4(c) of the Agreement is hereby deleted and replaced with "Section 6(b)(ii)(C)".

2. Section 6(b) of the Agreement is hereby deleted and replaced in its entirety with the following:

"(b) Severance Payments upon Termination Without Cause or For Good Reason.

(i) Termination Other than During a Change in Control Period. If, during the Term of Employment but outside the period beginning three months prior to and ending 18 months following a Change in Control (such period, a "Change in Control Period"), Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a waiver and release of claims agreement in a form approved by the Company that becomes effective and irrevocable in accordance with Section 11(d) hereof (a "Release"):

(A) During the nine-month period commencing on the Date of Termination (the "Severance Period"), the Company shall continue to pay Executive the Executive's Annual Base Salary, such payment to be made in accordance with the Company's regular payroll procedures, with the first such installment to occur on the first payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof and inclusive of any installments that would have been made had the Release been immediately effective and irrevocable.

(B) During the period commencing on the Date of Termination and ending on the last day of the Severance Period or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Internal Revenue Code of 1986, as amended (the "Code") and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; provided, however, that if (1) any plan

pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the COBRA Period (or remaining portion thereof).

(ii) Termination During a Change in Control Period. If, during the Term of Employment and during a Change in Control Period, Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a Release that becomes effective and irrevocable in accordance with Section 11(d) hereof:

(A) The Company shall pay to Executive an amount equal to the sum of (i) Executive's Annual Base Salary and (ii) Executive's target Annual Bonus. Such amount will be subject to applicable withholdings and payable in a single lump sum cash payment on the first regular payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof.

(B) During the period commencing on the Date of Termination and ending on the first anniversary thereof or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "CiC COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Code and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; *provided*, *however*, that if (1) any plan pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the CiC COBRA Period (or remaining portion thereof).

(C) The Company shall cause any unvested equity awards, including any stock options, restricted stock awards and any such awards subject to performance-based vesting, held by Executive as of the Date of Termination, to become fully vested and, if applicable, exercisable, and cause all restrictions and rights of repurchase on such awards to lapse with respect to all of the shares of the Company's Common Stock subject thereto."

3. **Counterparts**. This Amendment may be executed in one or more facsimile, electronic or original counterparts, each of which shall be deemed an original and both of which together shall constitute the same instrument.

4. **Ratification**. All terms and provisions of the Agreement not amended hereby, either expressly or by necessary implication, shall remain in full force and effect. The Agreement, as hereby amended, and any attachments thereto, constitute the entire agreement between the parties with respect to

their subject matter and supersede all prior agreements, arrangements, dealings or writings between the parties, and from and after the date of this Amendment, all references to the term "Agreement" in this Amendment or the original Agreement shall include the terms contained in this Amendment.

IN WITNESS WHEREOF, this Amendment to Employment Agreement has been duly executed by or on behalf of the parties hereto as of the Effective Date.

UNITY BIOTECHNOLOGY, INC.

By:/s/ Keith R. Leonard Jr.
Name: Keith R. Leonard Jr.
Title: Chief Executive Officer

EXECUTIVE

By:/s/ Jamie Dananberg
Name: Jamie Dananberg

UNITY BIOTECHNOLOGY, INC.

AMENDMENT TO
EMPLOYMENT AGREEMENT

THIS AMENDMENT TO EMPLOYMENT AGREEMENT (this "Amendment") is made and entered into effective as of March 9, 2020 (the "Effective Date"), by and between Unity Biotechnology, Inc., a Delaware corporation ("Company") and Daniel G. Marquess ("Executive").

WHEREAS, the Company and Executive are parties to that certain Employment Agreement dated as of January 29, 2018 (the "Agreement"), which sets forth the terms of Executive's employment with the Company;

WHEREAS, the Company and Executive desire to amend the Agreement, as set forth herein.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and conditions herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and Executive hereby agree as follows, effective as of the Effective Date.

1. The reference to "Section 6(b)(iii)" in the last sentence of Section 4(c) of the Agreement is hereby deleted and replaced with "Section 6(b)(ii)(C)".

2. Section 6(b) of the Agreement is hereby deleted and replaced in its entirety with the following:

"(b) Severance Payments upon Termination Without Cause or For Good Reason.

(i) Termination Other than During a Change in Control Period. If, during the Term of Employment but outside the period beginning three months prior to and ending 18 months following a Change in Control (such period, a "Change in Control Period"), Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a waiver and release of claims agreement in a form approved by the Company that becomes effective and irrevocable in accordance with Section 11(d) hereof (a "Release"):

(A) During the nine-month period commencing on the Date of Termination (the "Severance Period"), the Company shall continue to pay Executive the Executive's Annual Base Salary, such payment to be made in accordance with the Company's regular payroll procedures, with the first such installment to occur on the first payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof and inclusive of any installments that would have been made had the Release been immediately effective and irrevocable.

(B) During the period commencing on the Date of Termination and ending on the last day of the Severance Period or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Internal Revenue Code of 1986, as amended (the "Code") and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; provided, however, that if (1) any plan

pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the COBRA Period (or remaining portion thereof).

(ii) Termination During a Change in Control Period. If, during the Term of Employment and during a Change in Control Period, Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a Release that becomes effective and irrevocable in accordance with Section 11(d) hereof:

(A) The Company shall pay to Executive an amount equal to the sum of (i) Executive's Annual Base Salary and (ii) Executive's target Annual Bonus. Such amount will be subject to applicable withholdings and payable in a single lump sum cash payment on the first regular payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof.

(B) During the period commencing on the Date of Termination and ending on the first anniversary thereof or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "CiC COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Code and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; *provided*, *however*, that if (1) any plan pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the CiC COBRA Period (or remaining portion thereof).

(C) The Company shall cause any unvested equity awards, including any stock options, restricted stock awards and any such awards subject to performance-based vesting, held by Executive as of the Date of Termination, to become fully vested and, if applicable, exercisable, and cause all restrictions and rights of repurchase on such awards to lapse with respect to all of the shares of the Company's Common Stock subject thereto."

3. **Counterparts**. This Amendment may be executed in one or more facsimile, electronic or original counterparts, each of which shall be deemed an original and both of which together shall constitute the same instrument.

4. **Ratification**. All terms and provisions of the Agreement not amended hereby, either expressly or by necessary implication, shall remain in full force and effect. The Agreement, as hereby amended, and any attachments thereto, constitute the entire agreement between the parties with respect to

their subject matter and supersede all prior agreements, arrangements, dealings or writings between the parties, and from and after the date of this Amendment, all references to the term "Agreement" in this Amendment or the original Agreement shall include the terms contained in this Amendment.

IN WITNESS WHEREOF, this Amendment to Employment Agreement has been duly executed by or on behalf of the parties hereto as of the Effective Date.

UNITY BIOTECHNOLOGY, INC.

By:/s/ Keith R. Leonard Jr.
Name: Keith R. Leonard Jr.
Title: Chief Executive Officer

EXECUTIVE

By:/s/ Daniel G. Marquess
Name: Daniel G. Marquess

UNITY BIOTECHNOLOGY, INC.

AMENDMENT TO
EMPLOYMENT AGREEMENT

THIS AMENDMENT TO EMPLOYMENT AGREEMENT (this "Amendment") is made and entered into effective as of March 9, 2020 (the "Effective Date"), by and between Unity Biotechnology, Inc., a Delaware corporation ("Company") and Tamara L. Tompkins ("Executive").

WHEREAS, the Company and Executive are parties to that certain Employment Agreement dated as of January 29, 2018 (the "Agreement"), which sets forth the terms of Executive's employment with the Company;

WHEREAS, the Company and Executive desire to amend the Agreement, as set forth herein.

NOW, THEREFORE, in consideration of the premises and the mutual covenants and conditions herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and Executive hereby agree as follows, effective as of the Effective Date.

1. The reference to "Section 6(b)(iii)" in the last sentence of Section 4(c) of the Agreement is hereby deleted and replaced with "Section 6(b)(ii)(C)".

2. Section 6(b) of the Agreement is hereby deleted and replaced in its entirety with the following:

"(b) Severance Payments upon Termination Without Cause or For Good Reason.

(i) Termination Other than During a Change in Control Period. If, during the Term of Employment but outside the period beginning three months prior to and ending 18 months following a Change in Control (such period, a "Change in Control Period"), Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a waiver and release of claims agreement in a form approved by the Company that becomes effective and irrevocable in accordance with Section 11(d) hereof (a "Release"):

(A) During the nine-month period commencing on the Date of Termination (the "Severance Period"), the Company shall continue to pay Executive the Executive's Annual Base Salary, such payment to be made in accordance with the Company's regular payroll procedures, with the first such installment to occur on the first payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof and inclusive of any installments that would have been made had the Release been immediately effective and irrevocable.

(B) During the period commencing on the Date of Termination and ending on the last day of the Severance Period or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Internal Revenue Code of 1986, as amended (the "Code") and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; provided, however, that if (1) any plan

pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the COBRA Period (or remaining portion thereof).

(ii) Termination During a Change in Control Period. If, during the Term of Employment and during a Change in Control Period, Executive's employment is terminated by the Company without Cause or Executive resigns for Good Reason, then, in addition to the payments and benefits described in Section 6(a) above and subject to Executive's delivery to the Company of a Release that becomes effective and irrevocable in accordance with Section 11(d) hereof:

(A) The Company shall pay to Executive an amount equal to the sum of (i) Executive's Annual Base Salary and (ii) Executive's target Annual Bonus. Such amount will be subject to applicable withholdings and payable in a single lump sum cash payment on the first regular payroll date following the date the Release becomes effective and irrevocable or as otherwise provided in Section 11(d) hereof.

(B) During the period commencing on the Date of Termination and ending on the first anniversary thereof or, if earlier, the date on which Executive becomes eligible for comparable replacement coverage under a subsequent employer's group health plan (in any case, the "CiC COBRA Period"), subject to Executive's valid election to continue healthcare coverage under Section 4980B of the Code and the regulations thereunder, the Company shall, in its sole discretion, either (x) continue to provide to Executive and Executive's dependents, at the Company's sole expense, or (y) reimburse Executive and Executive's dependents for coverage under its group health plan (if any) at the same levels in effect on the Date of Termination; *provided*, *however*, that if (1) any plan pursuant to which such benefits are provided is not, or ceases prior to the expiration of the continuation coverage period to be, exempt from the application of Section 409A under Treasury Regulation Section 1.409A-1(a)(5), (2) the Company is otherwise unable to continue to cover Executive or Executive's dependents under its group health plans, or (3) the Company cannot provide the benefit without violating applicable law (including, without limitation, Section 2716 of the Public Health Service Act), then, in any such case, an amount equal to each remaining Company subsidy shall thereafter be paid to Executive in substantially equal monthly installments over the CiC COBRA Period (or remaining portion thereof).

(C) The Company shall cause any unvested equity awards, including any stock options, restricted stock awards and any such awards subject to performance-based vesting, held by Executive as of the Date of Termination, to become fully vested and, if applicable, exercisable, and cause all restrictions and rights of repurchase on such awards to lapse with respect to all of the shares of the Company's Common Stock subject thereto."

3. **Counterparts**. This Amendment may be executed in one or more facsimile, electronic or original counterparts, each of which shall be deemed an original and both of which together shall constitute the same instrument.

4. **Ratification**. All terms and provisions of the Agreement not amended hereby, either expressly or by necessary implication, shall remain in full force and effect. The Agreement, as hereby amended, and any attachments thereto, constitute the entire agreement between the parties with respect to

their subject matter and supersede all prior agreements, arrangements, dealings or writings between the parties, and from and after the date of this Amendment, all references to the term "Agreement" in this Amendment or the original Agreement shall include the terms contained in this Amendment.

IN WITNESS WHEREOF, this Amendment to Employment Agreement has been duly executed by or on behalf of the parties hereto as of the Effective Date.

UNITY BIOTECHNOLOGY, INC.

By:/s/ Keith R. Leonard Jr.
Name: Keith R. Leonard Jr.
Title: Chief Executive Officer

EXECUTIVE

By:/s/ Tamara L. Tompkins
Name: Tamara L. Tompkins

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-3 No. 333-231893) and related Prospectus of Unity Biotechnology, Inc.,
(2) Registration Statement (Form S-8 No. 333-224726) pertaining to the 2013 Equity Incentive Plan, the 2018 Incentive Award Plan and, 2018 Employee Stock Purchase Plan of Unity Biotechnology, Inc., and
(3) Registration Statement (Form S-8 No. 333-230086) pertaining to the 2018 Incentive Award Plan and 2018 Employee Stock Purchase Plan of Unity Biotechnology, Inc.

of our report dated March 11, 2020, with respect to the financial statements of Unity Biotechnology, Inc. included in this Annual Report (Form 10-K) of Unity Biotechnology, Inc. for the year ended December 31, 2019.

/s/ Ernst & Young LLP

Redwood City, California
March 11, 2020

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Keith R. Leonard Jr., certify that:

1. I have reviewed this Annual Report on Form 10-K of Unity Biotechnology, Inc. for the year ended December 31, 2019;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 11, 2020

By: /s/ Keith R. Leonard Jr.

Keith R. Leonard Jr.
Chairman and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Robert C. Goeltz II, certify that:

1. I have reviewed this Annual Report on Form 10-K of Unity Biotechnology, Inc. for the year ended December 31, 2019;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 11, 2020

By: /s/ Robert C. Goeltz II

Robert C. Goeltz II
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Unity Biotechnology, Inc. (the "Company") on Form 10-K for the year ending December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Keith R. Leonard Jr., Chairman and Chief Executive Officer of the Company, and Robert C. Goeltz II, Chief Financial Officer of the Company, do each hereby certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 11, 2020 By: /s/ Keith R. Leonard Jr.
Keith R. Leonard Jr.
Chairman and Chief Executive Officer
(Principal Executive Officer)

Date: March 11, 2020 By: /s/ Robert C. Goeltz II
Robert C. Goeltz II
Chief Financial Officer
(Principal Financial Officer)