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, 2018

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 001-38662

SUTRO BIOPHARMA, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**47-0926186**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
310 Utah Avenue, Suite 150 South San Francisco, California	**94080**
(Address of principal executive offices)	**(Zip Code)**

(650) 392-8412

(Registrant's telephone number, including area code)

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

Title of each class	**Name of each exchange on which registered**
Common Stock, $0.001 par value	**The Nasdaq Global 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 Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the issuer (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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

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 $15.20 per share of common stock on The Nasdaq Stock Market on September 27, 2018, was $214.4 million. The Registrant has elected to use September 27, 2018 as the calculation date, which was the initial trading date of the Registrant's common stock on The Nasdaq Stock Market, because on June 30, 2018 (the last business day of the Registrant's second fiscal quarter), the Registrant was a privately-held company. Shares of common stock held by each executive officer, director, and their affiliated holders have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of shares of the registrant's common stock outstanding as of March 27, 2019, was 22,925,441.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement to be filed for its 2019 Annual Meeting of Stockholders are incorporated by reference into Part III hereof. 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.

Sutro Biopharma, Inc.

ANNUAL REPORT ON FORM 10-K

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Forward-Looking Statements

This Annual Report on Form 10-K, or Annual Report, contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and section 27A of the Securities Act of 1933, as amended, or the Securities Act. All statements contained in this Annual Report other than statements of historical fact, including statements regarding our future results of operations and financial position, business strategy, market size, potential growth opportunities, nonclinical and clinical development activities, efficacy and safety profile of our product candidates, our ability to maintain and recognize the benefits of certain designations received by product candidates, the timing and results of nonclinical studies and clinical trials, collaboration with third parties, and the receipt and timing of potential regulatory designations, approvals and commercialization of product candidates, are forward-looking statements. The words "believe," "may," "will," "potentially," "estimate," "continue," "anticipate," "predict," "target," "intend," "could," "would," "should," "project," "plan," "expect," and similar expressions that convey uncertainty of future events or outcomes are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described in Item 1A, "Risk Factors" and elsewhere in this Annual Report. Moreover, we operate in a very competitive and rapidly changing environment, and new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties, and assumptions, the forward-looking events and circumstances discussed in this Annual Report may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this report to conform these statements to actual results or to changes in our expectations, except as required by law. You should read this Annual Report with the understanding that our actual future results, levels of activity, performance and events and circumstances may be materially different from what we expect.

Except where the context otherwise requires, in this Annual Report on Form 10-K, "we," "us," "our" and the "Company" refer to Sutro Biopharma, Inc.

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. We do not intend our use or display of other companies' trade names, trademarks or service marks to imply a relationship with, or endorsement or sponsorship of us by, these other companies.

PART I

Item 1. *Business*

Overview

We are a clinical stage drug discovery, development and manufacturing company focused on deploying our proprietary integrated cell-free protein synthesis platform, XpressCF™, to create a broad variety of optimally designed, next-generation protein therapeutics initially for cancer and autoimmune disorders. We aim to design therapeutics using the most relevant and potent modalities, including cytokine-based targets, immuno-oncology, or I/O agents, antibody-drug conjugates, or ADCs, and bispecific antibodies that are directed primarily against clinically validated targets where the current standard of care is suboptimal. We believe our platform allows us to accelerate the discovery and development of potential first-in-class and best-in-class molecules by enabling the rapid and systematic evaluation of protein structure-activity relationships to create optimized homogeneous product candidates. Our mission is to transform the lives of patients by using our XpressCF™ Platform to create medicines with improved therapeutic profiles for areas of unmet need.

Our two most advanced product candidates are wholly owned: STRO-001, an ADC directed against CD74, for patients with multiple myeloma and non-Hodgkin lymphoma, or NHL, and STRO-002, an ADC directed against folate receptor-alpha, or FolRα, for patients with ovarian and endometrial cancers. STRO-001 is currently enrolling patients in a Phase 1 trial, with initial safety data expected in mid-2019 and initial efficacy data expected by year end 2019. In October 2018, we were granted Orphan Drug Designation by the FDA, for STRO-001 for the treatment of multiple myeloma. We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019, with initial safety data expected by year end 2019. We have also entered into multi-target, product-focused collaborations with leaders in the field of oncology, including a cytokine derivatives collaboration with Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, or Merck, a B Cell Maturation Antigen, or BCMA, and an immuno-oncology directed alliance with Celgene Corporation, or Celgene, and an oncology-focused collaboration with Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name “EMD Serono”).

We believe our XpressCF™ platform is the first and only current Good Manufacturing Practices, or cGMP, compliant and scalable cell-free protein synthesis technology that has resulted in product candidates in clinical development. We believe key advantages of our cell-free protein synthesis platform over conventional biologic drug discovery and development include:

- ability to rapidly produce a wide variety of protein structures in-house;
- ability to incorporate multiple, different non-natural amino acids in a single protein;
- faster cycle time;
- efficient drug discovery and early pharmacology and safety assessment; and
- rapid and predictable scalability.

We plan to leverage these capabilities to accelerate the discovery and development of potential first-in-class and best-in-class molecules.

The benefits of our XpressCF™ Platform have resulted in collaborations with leaders in the field of oncology, including Merck, Celgene and EMD Serono. As a result of discovery efforts enabled through our XpressCF+™ Platform, Merck has the right to develop up to three cytokine derivatives for cancer and autoimmune disorders, with Merck to make a specific payment for the third product candidate. Additionally, Celgene has the worldwide right to develop an anti-cancer ADC and an anti-cancer bispecific antibody, with Celgene to make specific payments to us to obtain such worldwide rights to the second of the two product candidates, and development rights to two additional anti-cancer bispecific antibodies outside of the U.S. The lead candidate in this collaboration is a novel ADC therapeutic directed against BCMA for which an IND submission is expected in the first half of 2019. Under the collaboration with EMD Serono, we are using our XpressCF+™ Platform to discover and develop mono, bispecific or multispecific ADC product candidates against multiple cancer targets. The most advanced candidate in this collaboration is a bispecific ADC that is currently undergoing preclinical studies. To date, we have received in aggregate approximately $355 million in payments from all of our collaborations, which includes approximately $54 million in investments in our stock. We intend to selectively enter into additional collaborations with partners who are seeking efficient and effective drug discovery, preclinical development and manufacturing capabilities for the creation of novel therapeutics.

Our first internally developed product candidate is STRO-001, which we believe has the potential to be a first-in-class and best-in-class ADC directed against CD74, an antigen that is highly expressed in many B cell malignancies. In multiple preclinical models, STRO-001 has demonstrated potent anti-tumor activity. In addition, the properties of STRO-001 suggest a low likelihood of off-target toxicity and potential for an improved therapeutic index. STRO-001 is currently enrolling patients in a Phase 1 trial for multiple myeloma and NHL and we expect initial safety data in mid-2019 and expect initial efficacy data by year end 2019.

We are also internally developing STRO-002, an ADC directed against FolRα, initially targeted for the treatment of ovarian and endometrial cancers. Our experiments show that FolRα expression can be detected in 90% or more of ovarian and endometrial cancers. In preclinical models, STRO-002 has demonstrated the potential for enhanced and selective activity against cells expressing FolRα, superior inhibition of tumor growth and greater linker stability, in comparison to experiments we conducted with a benchmark FolRα-targeting molecule. We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019, with initial safety data expected by year end 2019.

Although we believe our product candidates have the potential to be first-in-class and/or best-in-class and to provide potent anti-tumor activity with reduced off-target toxicity, we will need to complete additional studies to determine the safety and efficacy of our product candidates. The results of these future studies may be different than the results of our earlier studies. We have not received regulatory approval for any of our product candidates, and in order to obtain regulatory approval and commercialize our product candidates, the FDA or foreign regulatory agencies will need to determine that our product candidates are safe and effective. We may not obtain regulatory approval on the timeline we currently expect, or at all, and competing therapies and products may ultimately reach the market faster or have more favorable safety and efficacy profiles than our products candidates.

Beyond these wholly owned programs and collaborations, we are developing a broader pipeline of next-generation protein therapeutics using our XpressCF™ Platform. Our protein engineering and chemistry efforts are focused on maximizing therapeutic indices, and our technology allows us to rapidly test our therapeutic hypothesis in significantly more product candidates than conventional protein synthesis allows in order to identify the best molecule to advance to the clinic. Our drug discovery teams are exploring novel immuno-oncology therapies, including cytokine-based therapies. We are also actively pursuing the discovery and development of other novel ADC and bispecific antibodies, including T cell-engager discovery programs.

Our Strategy

Our goal is to use our proprietary XpressCF™ Platform to create cytokine-based immuno-oncology therapeutics, ADCs and bispecific antibodies primarily against clinically validated targets. Key elements of our strategy are to:

- **Advance STRO-001 and STRO-002 through clinical development.** We are currently evaluating STRO-001 in a Phase 1 trial for patients with advanced and/or refractory multiple myeloma and NHL. Based on compelling preclinical data, we believe STRO-001 has the potential to be a first-in-class and best-in-class ADC directed against CD74, which is highly expressed in many B cell malignancies. We expect initial safety data in mid-2019 and expect initial efficacy data by year end 2019. In October 2018, we were granted Orphan Drug Designation by the FDA, for STRO-001 for the treatment of multiple myeloma. We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019, with initial safety data expected by year end 2019. Given that FolRα is a clinically validated target for ovarian cancer, along with STRO-002's homogeneous design, we believe it could be a best-in-class FolRα-targeted ADC and provide greater activity, stability and safety as compared to other investigational agents in development.
- **Develop a diverse pipeline of novel product candidates with optimal therapeutic profiles.** We intend to build a broad pipeline of optimally designed, next-generation protein therapeutics for cancer and autoimmune disorders using our XpressCF™ Platform. Our cell-free-based protein synthesis system enables the rapid and systematic evaluation of protein structure-activity relationships, which we believe will accelerate the discovery and development of molecules. We aim to take advantage of the most potent modalities, including cytokines, ADCs and bispecifics, to create drugs that are directed primarily against clinically validated targets where the current standard of care is suboptimal.

- **Strategically pursue additional collaborations to broaden the reach of our XpressCF™ Platform.** To maximize the value of our XpressCF™ Platform technology, we have entered into multi-target, product-focused collaborations with leaders in the field of oncology, including a cytokine derivatives collaboration with Merck, a BCMA and immuno-oncology directed alliance with Celgene and an oncology-focused ADC collaboration with EMD Serono. We intend to selectively enter into additional collaborations with partners who are seeking efficient and effective drug discovery and manufacturing capabilities for the development of novel therapeutics. As with some of our current collaborations, we intend to retain certain development and commercial rights to maximize the future potential value of product candidates discovered and developed using our XpressCF™ Platform.
- **Maintain worldwide rights to our core product candidates.** We own the worldwide commercial rights to our lead product candidates, STRO-001 and STRO-002. We have assembled a management team with extensive experience in the biopharmaceutical industry, including drug discovery and development through commercialization, and our plan is to independently pursue the development and commercialization of our product candidates. As we continue to advance our products, we may opportunistically pursue strategic partnerships that maximize the value of our pipeline.
- **Selectively expand the scope of our XpressCF™ Platform into other therapeutic areas.** Due to the versatility of our platform, we can explore additional therapeutic areas outside of oncology, such as autoimmune diseases. We intend to make further investment in the development of our XpressCF™ Platform to expand our pipeline of product candidates.

Cancer Remains a Major Unmet Medical Need

Cancer is the second leading cause of mortality in the United States, accounting for nearly one in every four deaths. Approximately 40% of Americans will develop cancer and, according to the American Cancer Society, there will be 1.8 million new cases of cancer and 607,000 deaths due to cancer in the United States in 2019.

Traditional Cancer Therapeutics

Cancer treatment has traditionally included chemotherapy, radiation, surgery or a combination of these approaches. Chemotherapy agents and other small molecule targeted therapies can be effective in certain types of cancer, but they can also cause toxicities that may lead to life-threatening consequences, lower quality of life or untimely termination of treatment. Furthermore, these agents offer limited efficacy in many types of cancer.

Over the last twenty years, new paradigms of cancer research and treatment have emerged to address the limitations of existing treatments. Some of the most promising new approaches involve biologic therapies, including monoclonal antibodies. Monoclonal antibodies are proteins that bind to antigen targets on tumor cells and inhibit tumor growth, or block processes that provide nourishment for the tumor. As a drug class, monoclonal antibodies have transformed the treatment of oncology and represent some of the top selling therapies on the market. For example, Roche's Avastin, Rituxan/CD20, and Herceptin/HER-2 franchises dominated the market with over $23 billion in combined 2018 annual sales.

Despite the success of conventional monoclonal antibodies, they still have limitations. For example, the response seen with monoclonal antibodies can be variable, with some patients responding, while others do not. In addition, the response is often not durable and many patients relapse or become refractory to treatment. Also, safety and tolerability concerns often limit the use of higher, potentially more efficacious doses. We believe our XpressCF™ Platform will provide enhanced therapeutic approaches for treating cancer to address these unmet needs. A new generation of biologics is emerging, including immuno-oncology agents, ADCs and bispecific antibodies. The expectation is that multiple therapeutic modalities will be used in novel combinations to treat patients and provide the most potent anti-cancer effect.

Immuno-Oncology

The immune system is capable of recognizing and eliminating tumor cells. However, some cancer cells over express proteins, called immune checkpoints, which suppress the immune system, and enable the tumor cells to evade destruction. Immuno-oncology has emerged as a promising new therapeutic approach that aims to enhance anti-tumor immune responses by using monoclonal antibodies to overcome these immune checkpoint blockades.

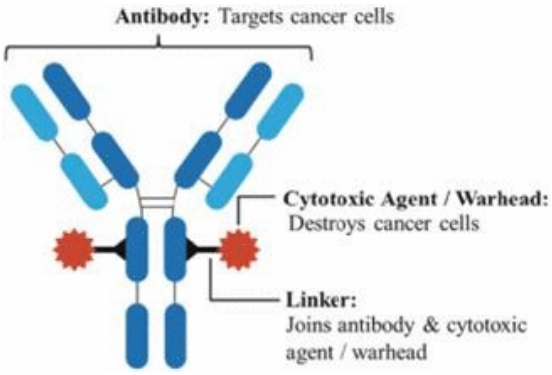
Monoclonal antibody immune checkpoint inhibitors, such as Opdivo, Keytruda and Yervoy, have been approved for the treatment of a number of cancer indications such as, melanoma, non-small cell lung cancer, or NSCLC, renal cancer and bladder cancer. The 2018 combined sales of these three checkpoint inhibitors are projected to be $16 billion and by 2022, forecasted sales are projected to exceed $27 billion.

Limitations to Current Immuno-Oncology Approaches

The effectiveness of any cancer immunotherapy is dependent on the status of an individual patient's immune system. While many single-agent immunotherapies have resulted in remarkable clinical results, only a minority of patients have realized durable benefits from these treatments. An immunotherapy cannot succeed if a patient's immune cells are too impaired to benefit from a particular checkpoint inhibitor or cytokine-based therapeutic. As a result, combination therapies have been explored clinically and are designed to provide an additional boost to revive a patient's ability to mount an immune response against their tumor. However, combination therapies will likely have to provide a significant risk-benefit advantage in order to justify the cumulative costs of combining two separate immunotherapies. New single agent approaches to achieving combinatorial stimulation of a patient's immune system may therefore create the preferred option for many patients and physicians.

Antibody-Drug Conjugates

After two decades of industry efforts, several new modalities of highly potent monoclonal antibody-based therapies have emerged, including ADCs. The key components of ADCs include an antibody, a stable linker and a cytotoxic agent (warhead). The antibody is used to target and deliver the cytotoxic agent to tumor cells. ADCs can be mono, bispecific or multi-specific. The intended result of this powerful and targeted approach is greater tumor cell death and less systemic tolerability issues as compared to traditional chemotherapy. The following diagram shows the component parts of an ADC.



Currently, there are more than 100 ADCs being explored in clinical development. Kadcyla and Adcetris are ADCs that have been approved for the treatment of specific subsets of breast cancer and lymphoma, respectively. In the second half of 2017, Besponsa and Mylotarg were approved for the treatment of specific subsets of leukemia. All four of these newly approved therapies demonstrate that ADCs have an emerging role in the armamentarium of cancer therapeutics.

Limitations to Current ADC Approaches

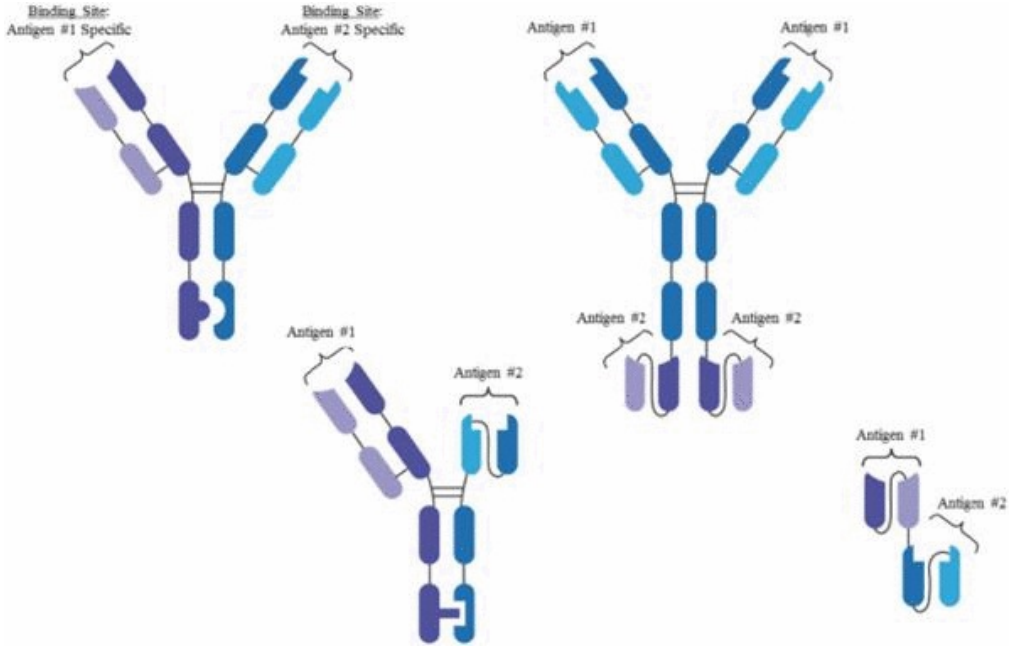
Despite the approvals of these ADCs, there have been challenges in achieving the full clinical potential of this modality. We believe these challenges are directly related to the following:

- *Heterogeneity as a Result of Imprecise and Variable Conjugation.* The approved ADCs and many that are in development use imprecise technologies that opportunistically attach the cytotoxic payload to naturally occurring amino acids within the antibody and result in a heterogeneous mixture. In these mixtures, the number and site location of the linker-warhead can vary significantly from antibody to antibody within the single ADC product. These many different forms in the final product are likely to perform differently, with some forms carrying insufficient cytotoxin to kill the tumor, and some forms carrying too high a load resulting in unintended toxicities. The overall performance of the heterogeneous ADC is therefore the average activity of the different species within the ADC mixture, which may limit both efficacy and tolerability. For these reasons, we believe this current class of ADCs, which are heterogeneous mixtures, are suboptimal for effective cancer treatment. The figure below compares homogeneous and heterogeneous ADCs.

- *Suboptimal Linker-Warhead Positioning.* Conventional ADC technologies use conjugation chemistry to attach linker-warheads to naturally occurring amino acids within an antibody; therefore, the position is dictated by the pre-existing amino acid sequence. Published research studies have demonstrated that linker-warhead positioning along an antibody can have significant effect on the ability of an ADC to kill tumor cells, with some positions resulting in suboptimal killing. This position effect also contributes to the challenge of a heterogeneous ADC mixture. We believe that superior ADCs can be developed using technologies that allow linker-warhead positioning to be fine-tuned to empirically determined sites for maximal therapeutic benefit.
- *Instability Due to Linker Design.* One of the major challenges in ADC technology has been to develop linking chemistries that ensure that warheads are only released from the antibody within a tumor cell, and not released within the blood or healthy tissue as the ADC is delivered systemically and travels through the body. We believe that safer ADCs can be developed by utilizing non-natural amino acids that enable state-of-the-art chemistries to ensure that the warhead is not prematurely released.

Bispecific Antibodies

Bispecific antibodies are engineered proteins that can simultaneously bind to two different types of antigens. Targeting two individual antigens simultaneously is expected to drive a larger clinical impact than conventional monoclonal antibodies. As a class, bispecific antibodies are projected to have potential sales on a worldwide basis of up to $4.4 billion by 2023 and over 40 molecules are currently in clinical development. Bispecific antibodies can be engineered in a variety of different formats as shown below.



Bispecific antibodies come in a wide variety of structural formats that can be used in multiple therapeutic modalities, including dual blocking bispecific antibodies, T cell-engaging bispecific antibodies and dual antigen targeting bispecific antibodies. Given the potential synergistic nature of these approaches, they have the potential to provide a similar, if not improved, therapeutic benefit as compared to a traditional combination approach. In addition, they may also demonstrate an improved safety and tolerability profile. These characteristics could allow for a wider therapeutic index as compared to the comparable combination therapy approach. Additionally, combining two mechanisms in a single bispecific antibody could have advantages in manufacturing, clinical development and patient convenience.

Limitations to Current Bispecific Antibody Approaches

Bispecific antibodies are highly engineered proteins with structural features not found in nature. The generation of these molecules therefore presents significant design and development challenges especially when using conventional cell-based technologies. These challenges include:

- *Optimization Challenges.* Bispecific antibodies simultaneously engage two different targets and therefore have precise requirements for the binding properties and spatial orientation of each domain in order to have pharmacologic activity. Combinatorial pairing of antibody binding arms to identify an optimized bispecific antibody requires many distinct cell lines that must be engineered during the discovery process, a cumbersome process when using conventional cell-based technologies.
- *Challenges to T Cell-Engagers.* Discovery of bispecific T cell-engagers is further limited by the challenge of designing bispecific pairs that can safely activate T cells specifically in the tumor environment without activating peripheral T cells, which would result in severe toxicities.
- *Difficulties in Protein Expression and Manufacturing.* Because bispecific antibodies are highly engineered proteins, conventional cell-based systems have significant difficulties in protein expression, particularly at a larger scale.

We believe that new protein engineering technologies will enable significantly broader design opportunities to discover new bispecific antibodies optimized for therapeutic activity, safety and manufacturability.

Cytokine-Based Immuno-Oncology Therapeutics

Cytokines are small biologically active proteins that play an essential role in immune cell function. Cytokines are important for cell-to-cell communication and are responsible for controlling immune cell growth and differentiation. Recombinant human cytokines were among the first biotechnology products engineered for therapeutic use, and, in the field of oncology, cytokines that stimulate the immune system to attack cancer cells have been viewed as a potential new approach.

Certain cytokines play a central role in T cell function, contributing to the careful balance between helpful and harmful immune responses. These can be powerful activators of the immune system but can also suppress immune responses through certain specialized T cells that have suppressive functions. A previously approved cytokine therapeutic Proleukin had shown therapeutic benefit in a small number of cancer patients but its therapeutic use was limited due to toxicity. Scientists at other companies have focused research on finding ways to modify cytokines so as to reduce toxicity while maintaining therapeutic benefit. The observed efficacy of a modified cytokine in combination with an immune checkpoint inhibitor indicates the potential of this new approach. In light of these data and our prior research into cytokines, we commenced a cytokine-based research program using our XpressCF+™ Platform technology and are now collaborating with Merck on developing cytokine derivatives. We believe that recent advances in immuno-oncology combined with new protein engineering technologies create opportunities to identify novel cytokine-based therapeutics with superior therapeutic indexes.

Our Proprietary XpressCF™ Platform

While cytokine-based immuno-oncology therapeutics, ADCs and bispecific antibodies hold significant promise, drug developers working with these complex biologics face significant design and development challenges. Optimizing these complex biological structures is a challenging, trial and error process that requires the refinement of several properties in tandem. This iterative process is cumbersome and fraught with significant limitations. As a result, the drug candidate nominated for development is often plagued by inefficient design properties, which then translates to a suboptimal therapeutic index when investigated in the clinic.

Our XpressCF™ Platform seeks to address these significant shortcomings. We believe our cell-free-based protein synthesis technology allows for efficient and proper design exploration to be conducted prior to nominating a lead drug candidate. In addition, we believe we can optimally design these types of complex biologics in a manner that is ideal for subsequent production at relevant scale and manufacture. We are the only company with products in clinical development that has the capability to produce cell-free-based protein synthesis at scale. We believe we have a significant advantage over other development approaches in this space.

Limitations of Current Cell-Based Synthesis Approaches

All existing therapeutic proteins rely on cell-based design, production and manufacturing technologies. The conventional biotechnology approach for the production of these complex biologics relies primarily on CHO cell lines. This first requires low yield transient production from cells that enable characterization of a new protein over several months. This is then followed by development of stable cell lines over several months to a year to enable larger scale preclinical, clinical and commercial production. The characterization process has to be reproduced for every minor variant of the therapeutic protein, which may or may not result in improved properties. Each change requires development of new cell-based methods to generate protein of sufficient quality and quantity to evaluate. Therefore, it is extremely laborious and resource intensive to elucidate principles of structure-activity relationship, and drug discovery is limited by the number of cell lines that can be practically managed in parallel. In addition, they have limited ability to introduce non-natural amino acids into proteins. We believe these limitations hinder the efficiency of drug discovery and often result in suboptimal protein selection.

Overview of Our XpressCF™ Platform

Our XpressCF™ Platform is fundamentally different from the conventional cell-based protein synthesis approach in that we separate the production of the cell mass from the production of the protein.

We first generate a cellular mass from our propriety cell line from which we harvest the inner cellular machinery for making proteins. The cellular mass is generated from our highly engineered variant of Escherichia coli, or E.coli bacteria, and has been optimized to make extract that produces complex mammalian proteins. These cells are grown over the course of several days, harvested, broken apart, clarified and stored as a cell mass for future production of our protein therapeutics. We refer to this proprietary cell mass as extract, or XtractCF. The extract includes necessary components for energy production, transcription and translation and can be used to support cell-free protein synthesis. This extract can then be used agnostically to manufacture a wide variety of therapeutic proteins and protein fragments without the need to generate further cell lines.

As a result, protein synthesis then becomes a predictable and reproducible biochemical reaction, independent of the constraints of a cell. A specific DNA sequence is added to the extract, which results in the coding and expression of the desired protein in less than 24 hours. Using this process, we express hundreds or thousands of DNA sequences simultaneously within the same cell-free extract system and therefore can make and purify hundreds or thousands of unique proteins at the same time. This allows us to perform rapid expression, testing and characterization of many variants early in discovery to elucidate structure-activity relationships. Structure-activity relationship refers to how changes to the structure of a protein can lead to improvements in a molecule's properties, such as binding, internalization, functional activity and stability, which are properties that are key to the therapeutic protein's efficacy and tolerability in the patient. We are thereby able to optimize many properties with high specificity including: binding efficiency to each antigen target, spatial orientation, linker design, target killing efficiency, immunological activity, protein expression and folding efficiency and stability.

Advantages of Our XpressCF™ Platform

We believe our drug discovery platform provides significant advantages over conventional cell-based protein synthesis approaches and has the ability to produce a large number of variants during the development stage, while preserving the ability to design and test large families of molecules for optimized efficacy and safety features. As a result, we believe that our drug discovery platform can accelerate time to IND by nine to fifteen months compared to conventional technologies.

We believe the advantages of our cell-free-based protein synthesis technology platform include:

- *Ability to Rapidly Produce and Evaluate a Wide Variety of Protein Structures In-house*. By decoupling the production of the cell-free extract from the production of the protein, we are able to stockpile large quantities of cell-free extract from which we are able to manufacture a wide variety of proteins without the need to generate individual cell lines, including cytokine-based immuno-oncology therapeutics, ADCs and bispecific antibodies.
- *Ability to Incorporate Non-Natural Amino Acids.* Our technology allows for efficient incorporation of a non-natural amino acid in any location in an antibody or protein with high precision and fidelity, which we believe allows for the design of optimized protein conjugates.
- *Faster Cycle Time.* Our ability to produce thousands of protein variants in parallel overnight allows us to rapidly express, test and characterize many variants early in discovery to elucidate structure-activity relationships and identify opportunities for superior therapeutic profiles, as well as new intellectual property. We are therefore able to efficiently optimize many properties with high specificity in parallel.
- *Efficient Drug Discovery and Early Pharmacology and Safety Assessment.* Our cell-free technology creates the opportunity for accelerated pharmacology and safety assessments during the design and discovery phase of product development. This approach allows us to generate optimized proteins early in our discovery process, which can be transitioned seamlessly to clinical scale production using the same cell-free process.
- *Rapid and Predictable Scalability*. Our cell-free extract does not need to be modified in any manner as we scale from research to preclinical to clinical to commercial production. This enables us to move more rapidly to the clinic by eliminating master cell banking activities and significantly de-risks scale-up to manufacturing.

Our XpressCF™ Solution for cytokine, ADCs and bispecific antibodies-based drug therapeutics

As a result, we believe our technology enables new approaches to cytokine, ADCs and bispecific antibody-based drug discovery, development and manufacturing. Key attributes are:

- *Homogeneous Design.* Our XpressCF™ Platform enables precise and specific placement of non-natural amino acids in defined numbers and positions within our engineered proteins. These non-natural amino acids then serve as highly stable attachment sites, also known as conjugation sites, for chemical functional groups. For example, we attach linker-warheads to non-natural amino acids within our antibodies to create single-species, tumor-killing ADCs. Similarly, we attach polyethylene glycol polymers onto non-natural amino acids within our cytokine-based therapeutics to create single-species immunotherapies designed for extended pharmacokinetics and safety.
- *Experimentally Defined Structure-Activity Relationships*. Our cell-free technology enables rational design of protein therapeutics through a rapid, reiterative process that experimentally defines structure-activity relationship for cytokine-based therapeutics, ADCs and bispecific antibodies. This approach allows us to explore a wide variety of structural features and formats in parallel as we optimize therapeutic candidates. For example, the precise location of chemical conjugation sites directly affects the activity of both ADCs and cytokine-based therapeutics. Our proprietary technology is key to our ability to define the best number and positions of non-natural amino acids for conjugation based on: conjugation efficiency; functional activity/pharmacological properties; and pharmacokinetics and safety. This design flexibility is also an important aspect of our discovery approach to other protein therapeutics. For example, we are able to make and directly compare a variety of pairings and structural formats for our immuno-oncology bispecific antibody and bispecific T cell-engager programs. This allows us to identify antibody pairs and formats with the best binding properties, spatial orientations and structural stability to create the optimal balance of therapeutic activity and safety.
- *Rapid and Efficient Transition from Discovery to the Clinic.* Protein therapeutics can encounter obstacles, or even fail, during the transition from research-grade cell lines to cGMP cell lines appropriate for clinical development and commercialization. Our XpressCF™ Platform can rapidly produce different protein types from a single proprietary extract, which can be scaled for discovery, development and ultimately, we believe, commercialization of cytokine-based immuno-oncology therapeutics, ADCs and bispecific antibodies and bispecific T cell-engagers.

Accordingly, we use our XpressCF™ Platform to discover and develop cancer therapeutics by empirically determining the optimum structure-activity relationships for cytokine-based immuno-oncology therapeutics, ADCs, bispecific antibodies, and transitioning those products to cGMP compliant manufacturing. The following chart illustrates the applicability of these attributes across the range of modalities we are developing.

XpressCF™ Attributes for Various Therapeutic Modalities

XpressCF™ Attribute	ADCs	Bispecific I/O, Bispecific ADCs and Bispecific T cell-engagers	Cytokine-based therapeutics
Homogeneous Design			
Stable, site-specific attachment of chemical functionality	✓	✓ (if needed)	✓
Experimentally Defined Structure-Activity Relationships			
Rapid, direct comparison of a wide variety of protein variants	✓	✓	✓
Rapid and Efficient Transition from Discovery to the Clinic			
Single-source scalability from discovery to clinical / commercial	✓	✓	✓

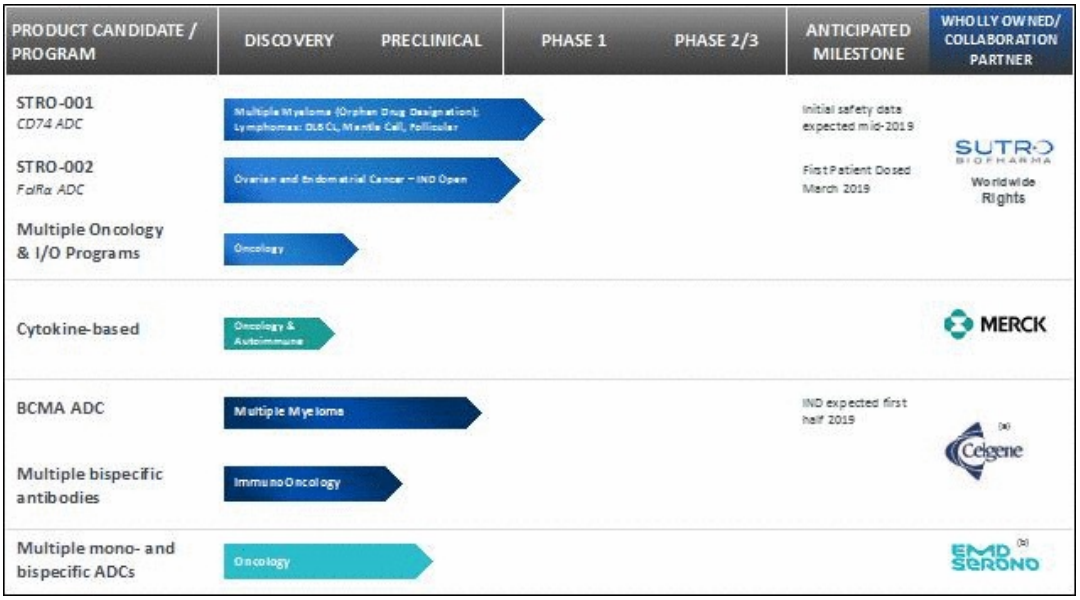
Our Collaborations Demonstrate our Capabilities

Our XpressCF™ Platform has garnered the attention of leading pharmaceutical and biopharmaceutical companies and resulted in collaborations to discover and develop novel therapeutics. We have leveraged these strategic partnerships to extend our own capabilities and broaden the scope of our XpressCF™ Platform. To date, all of our collaborations have provided us with approximately $355 million in payments, which includes approximately $54 million in investments in our stock. Our collaborations include:

- ***Merck Programs.*** We have granted Merck the right to jointly develop up to three research programs directed to cytokine derivatives for cancer and autoimmune disorders, including rights to certain prior cytokine-based research efforts.
- ***Celgene Programs.*** We have granted Celgene the right to jointly develop up to four anti-cancer bispecific antibodies and/or ADCs directed primarily to immuno-oncology targets. The lead candidate generated for this collaboration is a novel ADC therapeutic directed against the target BCMA for which an IND submission is expected in the first half of 2019.
- ***EMD Serono Programs.*** We have granted EMD Serono the right to designate up to six cancer targets against which we will discover, develop and optimize up to three mono, bispecific or multi-specific ADC product candidates per target. EMD Serono has selected all six possible target antigens under the strategic research and development partnership. The most advanced candidate in this collaboration is a bispecific ADC, which is currently in preclinical development.

Our Pipeline of Product Candidates and Discovery/Preclinical Programs

Our current product candidates and Discovery and Preclinical stage programs, all based on our proprietary XpressCF™ Platform, are summarized in the chart below:



(a) There are a total of four programs to which Celgene currently has ex-U.S. rights and we currently have U.S. rights. Celgene can obtain worldwide rights to the second product candidate to have an active IND in the United States by making certain payments to us. For the programs that would potentially be the third and fourth to enter clinical development, we own U.S. rights and Celgene owns ex-U.S. rights.

(b) EMD Serono is the U.S. healthcare business of Merck KGaA, Darmstadt, Germany.

Our Product Candidates

STRO-001, an ADC Directed Against the Cancer Target CD74

Overview

We are developing STRO-001, an optimally designed ADC directed against the cancer target CD74, for multiple myeloma and NHL. STRO-001 was designed and optimized for maximal therapeutic index by placing linker-warheads at specific locations within the antibody using our proprietary XpressCF+™ Platform. STRO-001 is currently enrolling patients in a Phase 1 trial and we expect initial safety data in mid-2019 and expect initial efficacy data by year end 2019.

CD74 Overview and Current Limitations

CD74 is a transmembrane glycoprotein, or a protein with an attached sugar that spans the inside and outside of a cell. While normal tissues appear to have minimal CD74 expression levels, CD74 is an important B cell target for multiple myelomas and lymphomas. CD74 is expressed in approximately 90% of B cell cancers, including multiple myeloma and lymphoma. Additionally, in a study conducted with a collaborator, we found that CD74 was highly expressed in 75% to 98% of tissues samples derived from individual patients with a variety of B cell malignancies, as illustrated in the table below.

Comprehensive Immunohistochemistry Study

Tumor Subtype	Tissue Samples CD74 Positive / Total	% Positive
Follicular lymphoma	148 / 151	98%
Multiple myeloma	101 / 134	75%
Diffuse large B cell lymphoma	135 / 140	96%
Mantle cell lymphoma	19 / 21	90%

Currently, there are no approved therapeutics that specifically target CD74 for treatment of B cell malignancies. We believe earlier ADCs being developed against the target CD74 were ineffective either because they failed to achieve sufficient killing of malignant B cells or they were unable to achieve a sufficient therapeutic benefit before toxicities limited further dose escalations.

B Cell Malignancies Overview and Current Limitations

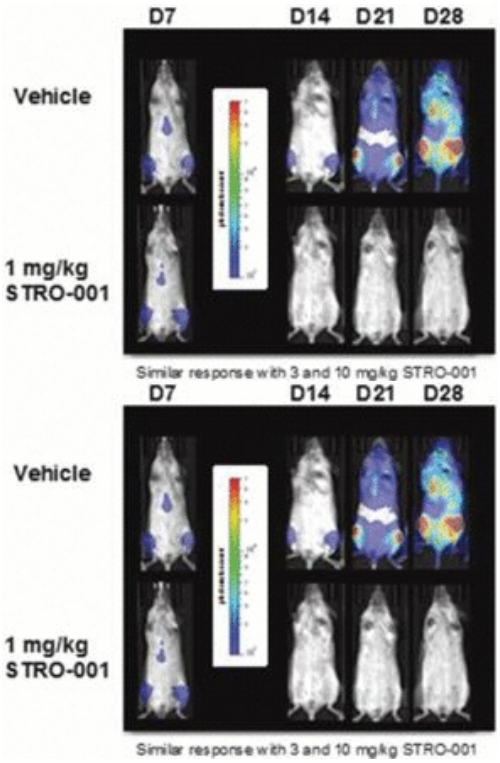
B cell malignancy tumor subtypes include multiple myeloma and NHL, which includes mantle cell lymphoma, diffuse large B cell lymphoma, or DLBCL, and follicular lymphoma. In the United States alone, there are approximately 100,000 new B cell malignancies cases annually, with a prevalence of more than 600,000 cases. Although several therapeutics have recently been approved for the treatment of specific B cell malignancies, including immunotherapies and targeted kinase inhibitors, unmet need persists. These therapeutics are typically used in combination with other agents to provide the most potent anti-cancer effect. While these new therapies have demonstrated improvements in survival, the majority of these patients ultimately relapse during treatment and some experience a resistance to therapy.

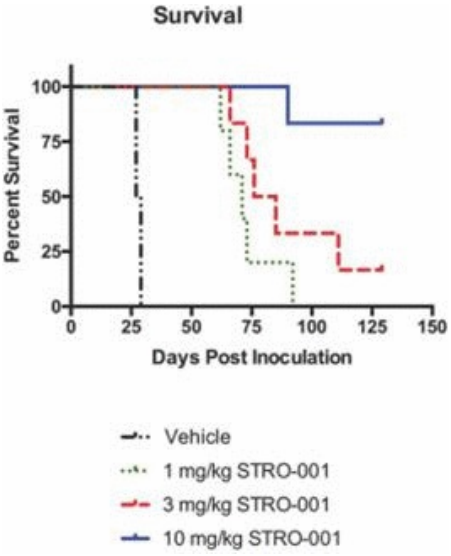
Our Solution, STRO-001

Our first internally developed product candidate is STRO-001, which we believe has the potential to be a first-in-class and best-in-class ADC directed against the cancer target CD74, an antigen that is highly expressed in many B cell malignancies and is an attractive target for an ADC therapeutic, given its rapid internalization by the cell. STRO-001 is an ADC targeting the CD74 protein antigen that was developed using our proprietary XpressCF+™ Platform. STRO-001 is composed of an antibody stably conjugated to a highly potent cytotoxic drug, a maytansinoid derivative, at two specific sites on the antibody using a non-cleavable linker. STRO-001 degrades inside of tumor cells to release very potent intracellular catabolites whose hydrophilic nature results in poor permeability into surrounding cells. We believe this decreases the potential of off-target effect in normal tissues. From a safety perspective, we designed STRO-001 to have an optimal potency to toxicity ratio. We rationally selected a homogeneous ADC with a drug-antibody ratio, or DAR, of two. Heterogeneous ADCs typically have DARs that range from zero to eight, with lower DARs generally being associated with less potency and higher DARs generally being associated with a negative impact on pharmacokinetics and toxicity. We chose a DAR of two after demonstrating that DARs of four or six did not increase the efficacy of STRO-001.

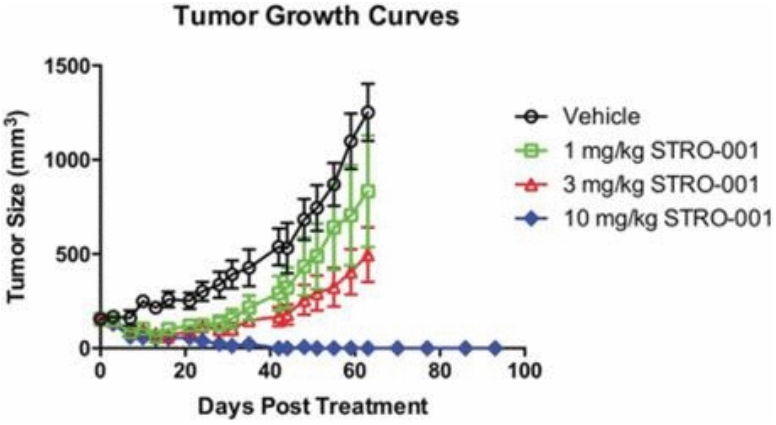
Preclinical Data

While additional clinical testing will be needed to determine the safety and efficacy of STRO-001 and to obtain regulatory approval, if ever achieved, STRO-001 has demonstrated potent *in vitro* cell killing activity across multiple B cell tumor lines. Based on these observations, we have used murine tumor models to determine whether STRO-001 also demonstrates cell killing *in vivo*. In these models, human tumor cell lines are implanted and allowed to grow in mice to subsequently test the activity of anti-cancer agents. Although these murine models do not address safety, they are commonly used to provide experimental proof-of-concept for anti-cancer activity against different tumor types. For example, in tumor bearing mice, single intravenous doses of 1, 3, and 10 mg/kg STRO-001 significantly extended survival in the MM1S-luc bioluminescent disseminated human multiple myeloma xenograft model as shown below on the right. The figure on the left shows bioluminescence imaging of tumor cells during the first month after dosing. This image shows that while the bioluminescent tumor cells disseminated throughout the body in the vehicle treated mice, the tumor cells were cleared from the STRO-001 treated mice. Furthermore, at the high dose, when their bone marrow was assessed at day 129, of the surviving five out of six animals, all appeared to be tumor-free.

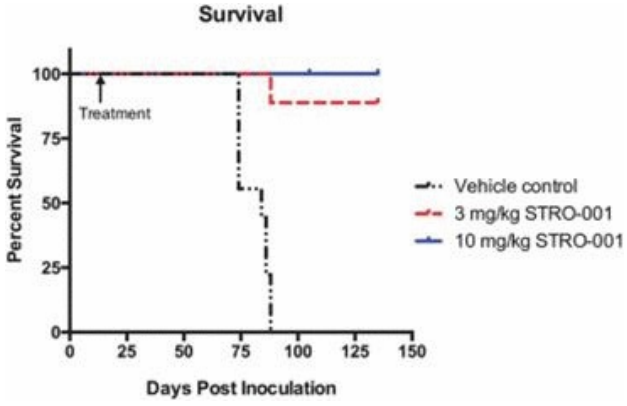




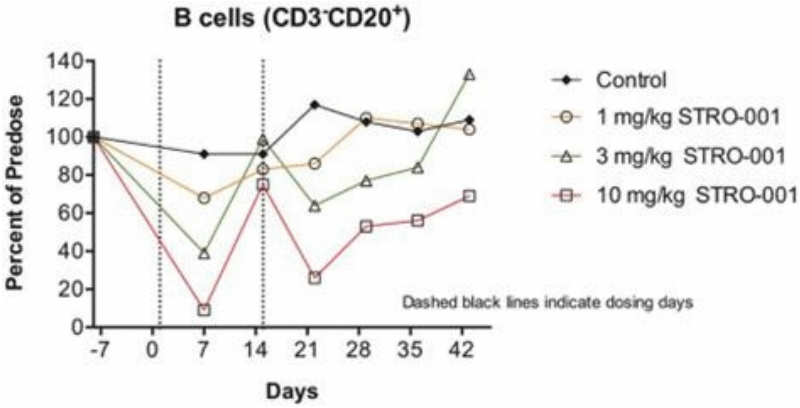
STRO-001 demonstrated similar potent efficacy in a murine xenograft model of human DLBCL, the most common form of NHL. In the study shown below, seven out of seven mice exhibited complete tumor regression with no tumor regrowth 90 days after treatment with a single 10 mg/kg dose of STRO-001. Moderate anti-tumor activity was observed with lower doses of 1 or 3 mg/kg, demonstrating a clear dose-response relationship.



We also examined the potential for STRO-001 to treat human mantle cell lymphoma in a preclinical murine xenograft model. In the study shown below, mice bearing mantle cell tumors had a mean survival of 81 days. In contrast, 90% to 100% of mice treated with a single dose of 3 or 10 mg/kg STRO-001 survived to the end of the study at day 135. Taken together, these studies demonstrate that STRO-001 has potent anti-tumor activity in three different murine models of human B cell malignancy.



We also investigated the safety of STRO-001 in a toxicology study in non-human primates at several dose levels administered on day 1 and day 15. Hematological toxicity was observed consistent with the known effects of the STRO-001 cytotoxic tubulin inhibitor component. No other drug-related toxicities were observed. Importantly, however, we observed clear evidence of STRO-001 pharmacodynamic activity as demonstrated by dose-dependent B cell ablation and recovery as shown below.



Clinical Development Plan

The Phase 1 trial for STRO-001 is an open-label study that will evaluate STRO-001 as a monotherapy for patients with multiple myeloma and NHL. The trial will be conducted in two parts: dose escalation and dose expansion. The primary objectives of the trial are to determine the safety and tolerability profile of STRO-001, determine the recommended Phase 2 dose and interval and evaluate preliminary anti-tumor activity. The secondary objectives are to characterize the human pharmacokinetics of STRO-001 and additional safety, tolerability and efficacy measures.

Our Phase 1 trial of STRO-001 is enrolling adult patients with advanced and/or refractory multiple myeloma and NHL (including DLBCL, mantle cell lymphoma and follicular lymphoma) who are refractory to, or intolerant of, all established therapy known to provide clinical benefit for their condition. Multiple myeloma and NHL patients will be enrolled in two separate dose escalation cohorts, starting initially with an accelerated dose titration design. We estimate that there will be approximately 30 patients in each cohort and treatment is scheduled for days one and fifteen in a 28-day cycle.

After the recommended Phase 2 dose level is determined, patients could be enrolled into four dose expansion cohorts (myeloma, DLBCL, mantle cell lymphoma and follicular lymphoma) if anti-tumor activity is observed during the dose escalation phase. We may enroll up to 40 patients in each of the four dose expansion cohorts.

We submitted our IND for STRO-001 in December 2017 and the first patient was dosed in April 2018. We expect initial safety data from our ongoing Phase 1 trial in mid-2019 and expect initial efficacy data by year end 2019. In October 2018, we were granted Orphan Drug Designation by the FDA for STRO-001 for the treatment of multiple myeloma.

STRO-002, an ADC Directed Against the Target Folate Receptor-Alpha (FolRα)

Overview

We are developing STRO-002, an optimally designed ADC directed against the cancer target FolRα, initially targeted for ovarian and endometrial cancers. STRO-002 was designed and optimized for an improved therapeutic index by placing a precise number of linker-warheads at four specific locations within the antibody using our proprietary XpressCF+™ Platform. We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019, with initial safety data expected by year end 2019.

FolRα Overview

FolRα is a cell-surface glycoprotein, which is believed to be important for supporting DNA synthesis in rapidly dividing cancer cells. FolRα exhibits limited expression and distribution in normal tissues.

High levels of FolRα have been found in multiple cancer types, including epithelial ovarian cancer, endometrial adenocarcinoma, triple negative breast cancer and non-small cell lung cancer. Expression appears to correlate with disease progression in ovarian cancer and continues to be expressed following chemotherapy treatment.

In order to better understand FolRα expression, we tested 187 samples in a tissue microarray from ovarian and endometrial cancer patients. The table below shows that more than 90% of ovarian and endometrial cancer tissue samples express FolRα. Furthermore, medium to high levels of expression were observed for 80% of ovarian cancer samples and 78% of endometrial cancer samples.

	FolRα Expression			
Tumor Type	**Negative**	**Low**	**Medium**	**High**
Ovarian Cancer (90 tissue samples)	10%	10%	16%	64%
Endometrial Cancer (97 tissue samples)	7%	15%	24%	54%

Ovarian Cancer Overview

Ovarian cancer is the most common cause of cancer death from gynecologic tumors in the United States, and the fifth most common cause of cancer death in women. In the United States alone, the American Cancer Society estimates that there will be about 23,000 new cases of ovarian cancer in 2019, and approximately 14,000 women die of this disease. Given that early stages of the disease cause minimal, nonspecific symptoms or is asymptomatic, 60% of patients with ovarian cancer are diagnosed in an advanced stage, for which the prognosis is poor. Standard pre- or post-operative chemotherapy for ovarian cancer is combination therapy with a platinum compound and a taxane, for example, carboplatin and paclitaxel, which achieves a complete response in between 70% to 80% of patients. Patients refractory or resistant to platinum-based treatments are then treated with a host of additional palliative chemotherapeutic agents, each showing only marginal benefit. This represents a significant unmet need and multiple therapies are being tested in the clinic for treatment of these patients, including PARP inhibitors and PD-1 checkpoint protein inhibitors.

Endometrial Cancer Overview

There is also a significant unmet need in the treatment of recurrent or metastatic endometrial cancer. In the United States alone, there are about 60,000 new cases of endometrial cancer annually, and approximately 10,500 patients die of this disease each year. First-line treatment for stage III/IV disease is commonly paclitaxel/carboplatin, with no standard of care or FDA-approved treatment options for recurrent disease. With the lack of available therapies for these patients, long-term survival prospects are poor and novel treatments offering even a modest improvement in progression-free survival or overall survival may be considered for expedited regulatory approval.

Limitations to Current FolRα -Targeted Therapeutics

There have been a number of folate- or FolRα -targeted therapies in development including naked antibodies, small molecule drug conjugates, ADCs and T cell retargeting molecules. The most clinically active agent targeting FolRα to date has been Immunogen's mirvetuximab soravtansine (IMGN853), an ADC composed of a FolRα -binding antibody linked to the tubulin-disrupting maytansinoid, DM4, via a cleavable linker.

Immunogen's IMGN853 monotherapy showed clinical activity in a Phase 1 trial of patients with platinum-resistant ovarian cancer, providing encouraging clinical validation for FolRα-targeting ADCs in this patient population. In early March 2019, Immunogen announced top-line results from its Phase 3 FORWARD I Study evaluating the safety and efficacy of mirvetuximab soravtansine compared to chemotherapy in patients with FRα-positive (with medium and high target expression levels), platinum-resistant ovarian cancer. The study did not meet its primary endpoint of progression-free survival, or PFS, in either the entire study population or in the pre-specified subset of patients with high FRα expression.

Our Solution, STRO-002

STRO-002 is directed against the cancer target FolRα, which is highly expressed in multiple cancer types, including ovarian cancer and endometrial cancer. This property, together with the highly restricted expression of FolRα on normal tissues, make FolRα a promising ADC approach.

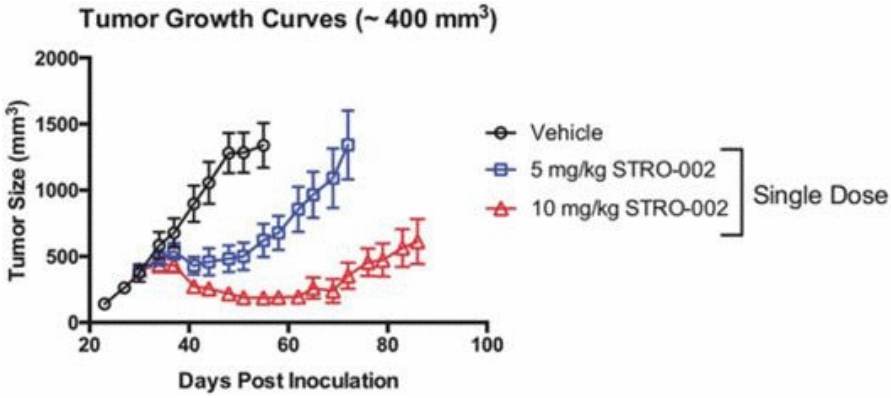
STRO-002 employs a cleavable linker that releases a cytotoxic drug inside of tumor cells, while being stable and resistant to cleavage in general circulation. The cytotoxic drug used is our proprietary hemiasterlin moiety. From a safety perspective, we designed STRO-002 to have the optimal potency to safety ratio. We rationally selected a homogenous ADC with an optimized DAR of four.

Based on preclinical findings, we believe our efficient homogeneous design of STRO-002 could provide anti-tumor activity, stability and safety with the potential to minimize off-target damage and improve clinical impact by reducing dose-limiting toxicities. We believe an improved therapeutic index could differentiate STRO-002 from conventional technology for the treatment of ovarian cancer and endometrial cancer. To test this, we have created a benchmark FolRα -targeting surrogate molecule based on conventional technology that has a heterogeneous ADC, with a similar DAR utilizing a DM4 linker-warhead. We have tested this benchmark molecule against STRO-002 in multiple preclinical models. However, additional preclinical and clinical testing will be needed to determine the safety and efficacy of STRO-002 and to obtain regulatory approval, if ever. STRO-002 may not ultimately provide a greater therapeutic benefit than the current standard of care.

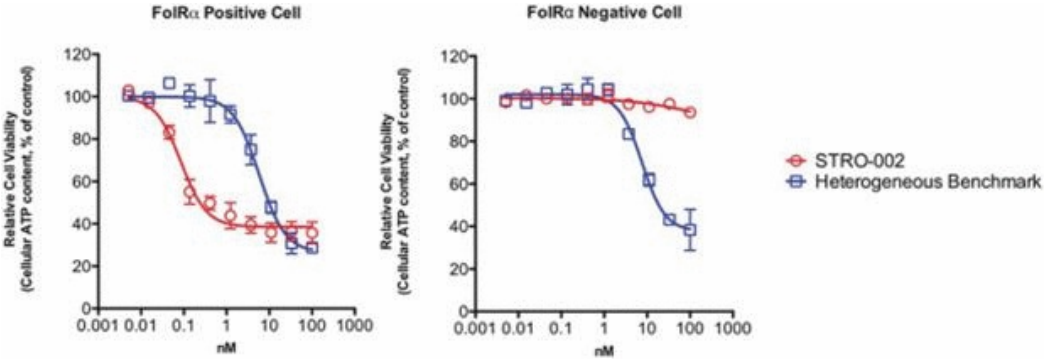
Preclinical Data

STRO-002, in comparison with the benchmark molecule that we created, has demonstrated: enhanced *in vitro* activity on cells expressing FolRα and improved specificity on cells that do not express FolRα; superior inhibition of tumor growth; and greater *in vitro* and *in vivo* linker stability.

STRO-002 has demonstrated potent *in vitro* cell killing activity across multiple ovarian cancer tumor cell lines. Based on these observations, we have used murine tumor models to determine whether STRO-002 also demonstrates cell killing *in vivo*. In these models, human tumor cells are implanted and allowed to grow in mice to subsequently test the activity of anti-cancer agents. Although these murine models do not address safety, they are commonly used to provide experimental proof-of-concept for anti-cancer activity against different tumor types. As shown in the data below, dose-dependent anti-tumor activity was observed in mice implanted with OVCAR3 human ovarian cancer tumor cells. Importantly, this anti-tumor effect was observed in mice bearing large established tumors, with evidence of tumor regression following a single dose of 10 mg/kg STRO-002.

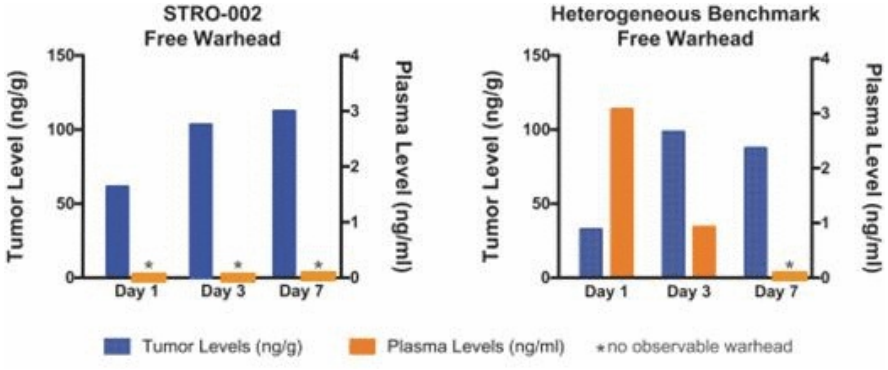


In an effort to better understand the relative activity of our homogeneous STRO-002 molecule, we have performed experiments comparing STRO-002 to a benchmark molecule that we created. STRO-002 and the benchmark molecule have comparable DAR and affinity for FolRα expressing cells; however, the benchmark is made using conventional ADC technology and is therefore a heterogeneous mixture. The data below demonstrates STRO-002 has more potent *in vitro* cell killing activity compared to the benchmark molecule when tested on cells expressing FolRα. In contrast, STRO-002 has minimal if any activity on cells that do not express FolRα, while the benchmark molecule kills cells even in the absence of FolRα. We believe that the data demonstrate that the homogeneous nature of STRO-002 drives more efficient tumor cell killing with better tolerability for normal tissues.



We used a human ovarian cancer xenograft model to understand the *in vivo* stability of STRO-002 compared to our benchmark molecule. In this model we tested for free warhead, released from the ADC, in the blood or tumor tissue one, three or seven days after dosing. The data below on the left show that the released, free warhead from STRO-002 is observed in the tumor starting one day after dosing, without evidence of free warhead circulating in the blood at any time point. In contrast, the data on the right shows that free warhead derived from the benchmark molecule can be observed circulating in the blood one day after dosing, which could contribute to unintended toxicities. In other preclinical studies, the free hemiasterlin warhead is cleared rapidly from the circulation. Taken together, we believe that these data demonstrate the stability of STRO-002 *in vivo*, which we believe will contribute to a superior therapeutic index compared to ADCs made using conventional technology.

Murine Tumor Model – Free Warhead in Tumor vs. Blood After Dosing



We examined the safety of STRO-002 in an exploratory toxicology study in non-human primates. Hematological toxicity was observed consistent with the known effects of the STRO-002 cytotoxic tubulin inhibitor component. No other drug-related toxicities were observed and, importantly, there were no observed ocular effects in the non-human primate study.

Clinical Development Plan

We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019, with initial safety data expected by year end 2019. Our Phase 1 trial for STRO-002 is an open-label study that will evaluate STRO-002 as a monotherapy for patients with ovarian and endometrial cancers. The trial is being conducted in two-parts, dose escalation and dose expansion. The primary objectives of the STRO-002 clinical trial are to determine the safety and tolerability profile, to define the recommended Phase 2 dose level and interval and to evaluate preliminary anti-tumor activity. Our secondary objectives are to characterize the human pharmacokinetics and additional safety, tolerability and efficacy measures.

We intend to seek to enroll adult patients with advanced and/or refractory ovarian cancer initially, for whom no suitable treatment exists. These patients are considered to have incurable disease and need repeated courses of life-prolonging and palliative treatment. We believe that ovarian cancer patients will be enrolled in a dose escalation cohort, with treatment frequency and duration yet to be determined. If anti-tumor activity is observed during the dose escalation phase, we would then plan to enroll patients into two dose expansion cohorts (ovarian cancer and endometrial cancer).

Additional Discovery Efforts

Our technology allows us to rapidly incorporate non-natural amino acids in varying numbers and positions, to identify the best cytokine modification for pharmacological activity, pharmacokinetics and safety. Furthermore, our technology enables rapid preclinical development and transition to cGMP manufacturing, ensuring speed to clinic in a promising field. Our drug discovery teams are exploring novel immuno-oncology therapies, including cytokine-based therapies.

We are also actively researching to identify new ADCs to add to our pipeline. We have multiple ADC discovery programs ongoing using our XpressCF+™ Platform. Our protein engineering and chemistry efforts are focused on maximizing therapeutic indices, and our technology allows us to rapidly test our therapeutic hypothesis in significantly more product candidates than conventional protein synthesis allows in order to identify the best molecule to advance to the clinic.

Our bispecific antibody drug discovery programs are focused on T cell-engagers. We are using our technology to find the optimum protein structure and T cell-engaging properties to maximize safety and efficacy for this promising class of cancer therapeutics.

Collaboration and License Agreements

Merck Collaboration

In July 2018, we entered into the 2018 Merck Agreement with Merck to jointly develop up to three research programs focusing on cytokine derivatives for cancer and autoimmune disorders.

Upon signing the 2018 Merck Agreement, Merck paid us an upfront payment of $60.0 million for the research and development of two target programs, and Merck purchased $20.0 million in Series E redeemable convertible preferred stock from us. Additionally, Merck purchased from us, concurrently with our initial public offering in a private placement, approximately $10.0 million of shares of our common stock at a price per share equal to the initial public offering price. Under the 2018 Merck Agreement, we are eligible to receive financial support for our research and development efforts based on an agreed-upon level of full-time equivalent personnel effort and related reimbursement rate, and we are eligible to receive another milestone payment if a third target program is selected.

Under the terms of the 2018 Merck Agreement, we are eligible to receive aggregate milestone payments of up to $1.6 billion, assuming the development and sale of all therapeutic candidates and all possible indications identified under the collaboration. If one or more products from each of the target programs are developed for non-oncology or a single indication, we will be eligible for reduced aggregate milestone payments. In addition, we are eligible to receive tiered royalties ranging from mid-single digit to low teen percentages on the worldwide sales of any commercial products that may result from the collaboration.

The 2018 Merck Agreement expires on a product-by-product and country-by-country basis upon the later of the expiration of the patents covering products licensed under the 2018 Merck Agreement or ten years after the first commercial sale of a product covered by the 2018 Merck Agreement. Upon expiration, Merck will have a fully paid-up, royalty-free, perpetual, and irrevocable non-exclusive license, with the right to grant sublicenses, under certain of our intellectual property rights.

Merck may terminate the 2018 Merck Agreement at any time with 60 days' prior written notice. Either we or Merck has the right to terminate the 2018 Merck Agreement based on the other party's uncured material breach or bankruptcy.

Celgene Collaboration

In September 2014, we entered into a Collaboration and License Agreement with Celgene, or the 2014 Celgene Agreement, to discover and develop bispecific antibodies and ADCs focused primarily on the field of immuno-oncology, using our proprietary integrated cell-free protein synthesis platform, XpressCF™. Under the 2014 Celgene Agreement, we received upfront payments totaling $95.0 million in September 2014, which included an $11.9 million equity investment, and additional payments totaling $60.0 million.

In August 2017, we entered an Amended and Restated Collaboration and License Agreement with Celgene, or the 2017 Celgene Agreement, to refocus our 2014 Celgene Agreement on four programs that are advancing throughout preclinical development, which are:

- *BCMA ADC*. The most advanced product candidate under collaboration is a BCMA ADC product candidate, which has been designated as a development candidate by Celgene for the treatment of multiple myeloma. We believe Celgene currently plans to submit an IND for this product candidate in the first half of 2019. We currently own the development and commercial rights in the United States to this BCMA ADC product candidate; however, assuming it is the first development candidate from our 2017 Celgene Agreement to have an active IND in the United States, Celgene will then automatically own worldwide development and commercialization rights to such product.
- *Bispecific Antibodies*. The other three product candidates subject to our Celgene collaboration are bispecific antibodies, all of which have been designated as development candidates by Celgene. We currently own the rights to develop and commercialize these product candidates in the United States; however, assuming the second development candidate from our 2017 Celgene Agreement achieves an active IND in the United States, and Celgene makes the required payments to us, then Celgene will automatically own worldwide development and commercialization rights to such second product.

Upon signing of the 2017 Celgene Agreement, we received an option fee payment of $12.5 million in August 2017 and are eligible to receive a second option fee payment of $12.5 million following the first IND clearance, if any, for one of the four programs, if Celgene desires to maintain its option to acquire the U.S. rights to develop and commercialize a second collaboration program to reach IND status. If Celgene exercises its option to acquire from us U.S. rights to a second collaboration program, it will make an option exercise fee payment to us, the amount of which depends on which program reaches IND status.

We have received and will be eligible to receive financial support for research and development services assigned to us by Celgene, based on an agreed-upon level of full-time equivalent personnel effort and related reimbursement rate.

Under the terms of the 2017 Celgene Agreement, we are entitled to earn development and regulatory contingent payments for each of the four programs under the collaboration, and royalties on sales of any commercial products that may result from the 2017 Celgene Agreement. Additionally, we received a $10.0 million payment in December 2018 for certain manufacturing activities. For licensed products for which Celgene holds worldwide rights, we are eligible to receive aggregate milestone and option fee payments of up to $295.0 million for certain licensed products and up to $393.7 million for certain other licensed products under the collaboration, if approved in multiple indications, and, depending on the licensed product, tiered royalties ranging from single digit to low teen percentages on worldwide sales of any commercial products that may result from the 2017 Celgene Agreement. Additionally, for licensed products for which Celgene holds ex-U.S. rights, we will also be eligible to receive pre-commercial contingent payments and tiered royalties ranging from mid to high single digit percentages.

Celgene may terminate the 2017 Celgene Agreement at any time with 120 days' prior written notice. Either we or Celgene has the right to terminate the 2017 Celgene Agreement based on the other party's uncured material breach, challenge of the validity and enforceability of intellectual property, or bankruptcy.

In January 2019, Bristol-Myers Squibb announced the entry into a definitive agreement to acquire Celgene with the intent of creating a leading focused specialty biopharma company. The transaction is expected to complete in the third quarter of 2019, subject to approval by company shareholders, customary closing conditions, and regulatory approvals.

EMD Serono Collaboration

In September 2014, we entered into a License Agreement with EMD Serono, or the MDA Agreement, to develop ADCs for multiple cancer targets, which replaced the Collaboration Agreement we had entered into with EMD Serono in May 2014, or the Collaboration Agreement. The most advanced program in the collaboration is a bispecific ADC drug candidate currently in preclinical development.

Upon signing the Collaboration Agreement, we received $10.0 million in an upfront payment. In addition, upon signing the MDA Agreement, we received an additional $10.0 million in an upfront payment and receive financial support for our research and development services based on an agreed-upon level of full-time equivalent personnel effort and related reimbursement rate. As of December 31, 2018, we had received approximately $9.3 million in funding support for research and development services. We anticipate entering into a manufacturing supply agreement with EMD Serono to provide them with product candidate materials for IND-enabling and clinical studies.

We are eligible to receive up to $52.5 million for each product developed under the MDA Agreement, primarily from pre-commercial contingent payments. In addition, we are eligible to receive tiered royalties ranging from low to mid single digit percentages, along with certain additional one-time royalties, on worldwide sales of any commercial products that may result from the MDA Agreement. The MDA Agreement term expires on a product-by-product and country-by-country basis upon the later of the expiration of the patents covering products licensed under the MDA Agreement or ten years after the first commercial sale of a product covered under the MDA Agreement. Upon expiration, EMD Serono will have a fully paid-up, royalty-free, perpetual, and irrevocable non-exclusive license, with the right to grant sublicenses, under certain of our intellectual property rights.

EMD Serono may terminate the MDA Agreement at any time with 90 days' prior written notice or upon our inability to provide EMD Serono access to a specified number of cancer drug targets. Either we or EMD Serono has the right to terminate the MDA Agreement based on the other party's uncured material breach or bankruptcy.

Stanford License

In October 2007, we entered into an Amended and Restated Exclusive Agreement, or the Stanford License, with the Board of Trustees of the Leland Stanford Junior University, or Stanford, that grants us an exclusive license, with the right to sublicense, under the patent rights owned by Stanford covering certain technology rights related to our XpressCF™ expression system.

Upon initiation of the agreement, we made a payment to Stanford of approximately $83,000, of which a portion was creditable against certain prior patent costs incurred by Stanford, reimbursement of certain out-of-pocket costs incurred by Stanford in patent filing, prosecution and maintenance of approximately $184,000, and issued shares of our common stock to Stanford. We are required to make milestone payments to Stanford of up to approximately $930,000 on the accomplishment of certain development and regulatory milestones, of which $180,000 has been paid through December 31, 2018, with a $750,000 payment due upon first commercial sale of the first licensed product consisting of a molecule or compound covered by the licensed patent rights, or the 14th anniversary of the Stanford License in October 2021. Additionally, we owe Stanford annual license maintenance fees of $75,000, which may be creditable against earned royalties in such year, and are required to reimburse Stanford for ongoing patent-related costs. We are also required to pay to Stanford low single digit royalties on net sales and to share any sublicensing income received related to the licensed technology. We may terminate the agreement at any time upon 30 days' written notice.

SutroVax Investment

In 2013, we and Johnson & Johnson Innovation, through the Johnson & Johnson Development Corporation, provided initial co-funding for a new company called SutroVax, Inc., or SutroVax, with which we have a license agreement. Under the agreement, SutroVax has the right to use the XpressCF+™ Platform to discover and develop vaccine candidates for the treatment or prophylaxis of infectious diseases. The lead program for SutroVax is a broad-spectrum pneumococcal conjugate vaccine. SutroVax is responsible for performing all research and development activities, and we provide technical support and supply XtractCF and other materials to SutroVax.

We retain an ownership interest in SutroVax and are eligible for single digit royalties on net sales of any vaccine candidates. Also, we retain the right to discover and develop vaccines for the treatment or prophylaxis of any disease that is not caused by an infectious pathogen, including cancer.

Manufacturing

We have significant expertise in the production of therapeutic biologics. Our proprietary XpressCF™ Platform is a cell-free protein synthesis technology that enables rapid and systematic process development, streamlined scale-up and cGMP manufacturing.

Extract and Reagents

We manufacture our cell-free extract, and expect to manufacture related reagents, in our cGMP manufacturing facility in San Carlos, California for our clinical trials and supply commitments. If we are successful in developing an effective strategic relationship with a contract manufacturing organization, or CMO, we would consider supplementing our manufacturing capacity by outsourcing the production of cell-free extract and related reagents to such CMO to cover our needs during product launch and for long-term commercial supply.

Drug Substance and Drug Product

Our process development and manufacturing strategies are tailored to rapidly advance our product candidates, including the use of a supply chain of established CMOs to ensure successful execution. The production of antibodies will be done by either us or CMOs, depending on our internal cGMP production capacity. The production of all other necessary elements for the manufacture of our ADC product candidates, and the final manufacture of the ADC drug product, will be handled entirely by CMOs. Our XpressCF+™ Platform has been successfully used for manufacturing several antibodies and requires minimal process optimization to support early clinical phase manufacturing. We utilize industry established production steps for the purification of our antibodies. The CMOs we have selected have strong track records in cGMP manufacturing with expertise in clinical or commercial drug manufacturing for the cytotoxic agent, conjugation and fill-finish of therapeutic biologics. All activities from cell-free extract production to formulated drug product are performed to maintain aggressive timelines and minimize delays.

Competition

The biotechnology and biopharmaceutical industries, and the immuno-oncology subsector, are characterized by rapid evolution of technologies, fierce competition and strong defense of intellectual property. Any product candidates that we successfully develop and commercialize will have to compete with existing therapies and new therapies that may become available in the future. While we believe that our proprietary XpressCF™ Platform and scientific expertise in the field of biologics and immuno-oncology provide us with competitive advantages, a wide variety of institutions, including large biopharmaceutical companies, specialty biotechnology companies, academic research departments and public and private research institutions, are actively developing potentially competitive products and technologies. We face substantial competition from biotechnology and biopharmaceutical companies developing products in immuno-oncology. Our competitors include larger and better funded biopharmaceutical, biotechnological and therapeutics companies, including companies focused on cancer immunotherapies, such as AstraZeneca PLC, Bristol-Myers Squibb Company, or BMS, GlaxoSmithKline PLC, Merck & Co., Inc., Novartis AG, Pfizer Inc., or Pfizer, Roche Holding Ltd, Sanofi S.A and companies focused on ADCs, such as Pfizer, ImmunoGen, Inc., Seattle Genetics, Inc. and Genentech, Inc., or Genentech, as well as numerous small companies. Moreover, we also compete with current and future therapeutics developed at universities and other research institutions.

If our lead product candidates are approved, they will compete with a range of therapeutic treatments that are either in development or currently marketed. Currently marketed oncology drugs and therapeutics range from ADCs, such as Genentech's Kadcyla, to immune checkpoint inhibitors, such as BMS's Opdivo, to T cell-engager immunotherapies, such as Amgen, Inc.'s Blincyto. In addition, numerous compounds are in clinical development for cancer treatment. With respect to B cell based malignancies, such as multiple myeloma, the most common treatments are chemotherapeutic compounds, radiation therapy, stem cell transplantation and immunomodulating agents. The clinical development pipeline for cancer includes small molecules, antibodies, vaccines, cell therapies and immunotherapies from a variety of companies and institutions.

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 than us 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 being 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 trial sites and patient registration for clinical trials 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, less toxic, 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 the entry of our products. We believe the factors determining the success of our programs will be the efficacy, safety and convenience of our product candidates.

Reimbursement

The regulations that govern pricing and reimbursement for new drugs and therapeutic biologics vary widely from country to country. Some countries require approval of the sale price of a drug or therapeutic biologic before it can be marketed. In many countries, the pricing review period begins after marketing approval is granted. In some foreign markets, prescription biopharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, a drug company can obtain regulatory approval for a product in a particular country, but then be subject to price regulations that delay commercial launch of that product.

A drug company's ability to commercialize any products successfully will also depend in part on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from government authorities, private health insurers and other organizations. Even if one or more products are successfully brought to the market, these products may not be considered cost-effective, and the amount reimbursed for such products may be insufficient to allow them to be sold on a competitive basis. Increasingly, third-party payors who reimburse patients or healthcare providers, such as government and private insurance plans, are requiring that drug companies provide them with predetermined discounts from list prices, and are seeking to reduce the prices charged or the amounts reimbursed for biopharmaceutical products.

Significant delays can occur in obtaining reimbursement for newly-approved drugs or therapeutic biologics, and coverage may be more limited than the purposes for which the drug or therapeutic biologic is approved by the FDA or similar foreign regulatory authorities. Moreover, eligibility for reimbursement does not imply that any drug or therapeutic biologic will be reimbursed in all cases or at a rate that covers a drug company's costs, including research, development, manufacture, sale and distribution.

Interim reimbursement levels for new drugs or therapeutic biologics, if applicable, may also be insufficient to cover a drug company's costs and may not be made permanent. Reimbursement rates may be based on payments allowed for lower cost drugs or therapeutic biologics that are already reimbursed, may be incorporated into existing payments for other services and may reflect budgetary constraints or imperfections in Medicare data. Net prices for drugs or therapeutic biologics may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs or therapeutic biologics from countries where they may be sold at lower prices than in the United States. Further, no uniform policy for coverage and reimbursement exists in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. Therefore, coverage and reimbursement can differ significantly from payor to payor.

Intellectual Property

We strive to protect and enhance the proprietary technology, inventions, and improvements that are commercially important to our business, including seeking, maintaining, and defending patent rights, whether developed internally or licensed from third parties. Our policy is to seek to protect our proprietary position by, among other methods, pursuing and obtaining patent protection in the United States and in jurisdictions outside of the United States related to our proprietary technology, inventions, improvements, platforms and product candidates that are important to the development and implementation of our business. Our patent portfolio is intended to cover, but is not limited to, our technology platforms, our product candidates and components thereof, their methods of use and processes for their manufacture, our proprietary reagents and assays, and any other inventions that are commercially important to our business. We also rely on trade secret protection of our confidential information and know-how relating to our proprietary technology, platforms and product candidates, continuing innovation, and in-licensing opportunities to develop, strengthen, and maintain our proprietary position in our XpressCF™ Platform and product candidates. We expect to rely on data exclusivity, market exclusivity, patent term adjustment and patent term extensions when available. Our commercial success may depend in part on our ability to obtain and maintain patent and other proprietary protection for our technology, inventions, and improvements; to preserve the confidentiality of our trade secrets; to maintain our licenses to use intellectual property owned or controlled by third parties; to defend and enforce our proprietary rights, including our patents; to defend against and challenge the assertion by third parties of their purported intellectual property rights; and to operate without the unauthorized infringement on the valid and enforceable patents and other proprietary rights of third parties.

We believe that we have a strong global intellectual property position and substantial know-how and trade secrets relating to our XpressCF™ platform technology, platform and product candidates. Our patent portfolio as of December 31, 2018 contained 12 U.S. issued patents and 78 patents issued in ex-U.S. jurisdictions including Europe, China, Japan, Australia and Singapore and 30 U.S. pending applications as well as 79 patent applications pending in ex-U.S. jurisdictions including Europe, China, Japan, Australia and Singapore owned solely by us. These patents and patent applications include claims relating:

- bacterial strains, and extracts prepared therefrom, comprising an engineered Release Factor 1 protein, which facilitates incorporation of non-natural amino acids into proteins;
- bacterial strains, and extracts prepared therefrom, comprising combinations of chaperone proteins, which facilitate expression of complex eukaryotic proteins in bacterial extracts;
- antibodies targeting receptors of interest, including CD74 and FolRα;
- ADCs targeting receptors of interest, including CD74 and FolRα;
- hemiasterlin, both as a cytotoxin and as a linker-warhead, which is used in our STRO-002 product candidate; and
- para-azidomethylphenylalanine, or pAMF, and proteins comprising pAMF, our workhorse non-natural amino acid which is primarily used when we conjugate molecules to proteins produced with our XpressCF+™ Platform.

Our issued patents, and any patents that may issue from our pending patent applications, in our solely owned patent portfolio are expected to expire between January 2030 and October 2039, absent any patent term adjustments or extensions.

In addition, we have exclusively licensed the following patent portfolio from Stanford: 15 U.S. issued patents and 44 patents issued in ex-U.S. jurisdictions including Europe, China, Canada, India, Australia, South Korea, Eurasia and Singapore. This patent portfolio includes claims relating to methods related to *in vitro* protein synthesis that we use in our XpressCF™ Platform when discovering, developing and manufacturing our product candidates.

Patents in our patent portfolio licensed from Stanford are expected to expire between March 2019 and January 2028, absent any patent term adjustments or extensions.

As for the XpressCF™ Platform, product candidates and processes we develop and commercialize, in the normal course of business, we intend to pursue, where appropriate, patent protection or trade secret protection relating to compositions, methods of manufacture, assay methods, methods of use, treatment of indications, dosing and formulations. We may also pursue patent protection with respect to product development processes and technology.

The following table describes the material patents and patent applications owned or licensed by us.

Patent Relevance	Ownership	Type of Patent Protection	Expiration or Anticipated Expiration (absent patent term extension or adjustment)	Pending Jurisdictions	Issued Jurisdictions
XpressCF™ Platform	In licensed from Stanford	Utility	2023	None	US, AU, CA, EP, JP
XpressCF™ Platform	Owned by Sutro	Utility	2033	US, CA, CN, IL, IN, JP, KR,	US, AU, EP, SG
XpressCF™ Platform	Owned by Sutro	Utility	2034	US, CA, CN, EP, HK, IL, IN, JP, KR, SG	AU
XpressCF™ Platform	Owned by Sutro	Utility	2034	US	EP
XpressCF™ Platform	Owned by Sutro	Utility	2035	None	US, EP
STRO-001 and STRO-002	Owned by Sutro	Utility	2033	US, BR, CA, CN, EP, JP, IN, HK, KR	US, AU, SG
STRO-001 and STRO-002	Owned by Sutro	Utility	2033	US, BR, CA, EP, HK, IL, IN, JP, KR	US, AU, CN, SG
STRO-001	Owned by Sutro	Utility	2035	US, EP	None
STRO-001	Owned by Sutro	Utility	2037	PCT	None
STRO-001	Owned by Sutro	Utility	2037	PCT	None
STRO-001	Owned by Sutro	Provisional	2038	PCT	None
STRO-002	Owned by Sutro	Utility	2037	PCT	None
STRO-002	Owned by Sutro	Provisional	2038	US	None
STRO-002	Owned by Sutro	Utility	2036	US, AU, BR, CA, CN, EP, IL, IN, JP, KR, SG	None

We continually assess and refine our intellectual property strategy as we develop new platform technologies and product candidates. To that end, we are prepared to file additional patent applications if our intellectual property strategy requires such filings, or where we seek to adapt to competition or seize business opportunities. Further, we are prepared to file patent applications, as we consider appropriate under the circumstances, relating to the new technologies that we develop. In addition to filing and prosecuting patent applications in the United States, we often file counterpart patent applications in the European Union and in additional countries where we believe such foreign filing is likely to be beneficial, including but not limited to any or all of Australia, Brazil, Canada, China, Hong Kong, India, Israel, Japan, Mexico, New Zealand, Singapore and South Korea.

The term of individual patents depends upon the laws of the countries in which they are obtained. In most countries in which we file, the patent term is 20 years from the earliest date of filing of a non-provisional patent application. However, the term of United States patents may be extended for delays incurred due to compliance with the FDA requirements or by delays encountered during prosecution that are caused by the United States Patent and Trademark Office, or the USPTO. For example, the Hatch-Waxman Act permits a patent term extension for FDA-approved drugs of up to five years beyond the expiration of the patent. The length of the patent term extension is related to the length of time the drug is under regulatory review. Patent extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, and only one patent applicable to an approved drug may be extended. Similar provisions are available in Europe and other jurisdictions to extend the term of a patent that covers an approved drug. In the future, if and when our biopharmaceutical product candidates receive FDA approval, we expect to apply for patent term extensions on patents covering those product candidates. We intend to seek patent term extensions to any of our issued patents in any jurisdiction where these are available; however there is no guarantee that the applicable authorities, including the USPTO and FDA, will agree with our assessment of whether such extensions should be granted, and even if granted, the length of such extensions. Our currently issued patents will likely expire on dates ranging from 2030 to 2035, unless we receive patent term extension or patent term adjustment, or both. If patents are issued on our pending patent applications, the resulting patents are projected to expire on dates ranging from 2033 to 2039, unless we receive patent term extension or patent term adjustment, or both. However, the actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

The patent positions of companies like ours are generally uncertain and involve complex legal and factual questions. No consistent policy regarding the scope of claims allowable in patents in the field of immunotherapy has emerged in the United States. The patent situation outside of the United States is even more uncertain. Changes in the patent laws and rules, either by legislation, judicial decisions, or regulatory interpretation in the United States and other countries may diminish our ability to protect our inventions and enforce our intellectual property rights, and more generally could affect the value of our intellectual property. In particular, our ability to stop third parties from making, using, selling, offering to sell, or importing any of our patented inventions, either directly or indirectly, will depend in part on our success in obtaining, defending, and enforcing patent claims that cover our technology, inventions, and improvements. With respect to both licensed and company-owned intellectual property, we cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications filed by us in the future, nor can we be sure that any of our existing patents or any patents that may be granted to us in the future will be commercially useful in protecting our platforms and product candidates and the methods used to manufacture those platforms and product candidates. Moreover, even our issued patents do not guarantee us the right to practice our technology in relation to the commercialization of our platform's product candidates. However, the area of patent and other intellectual property rights in biotechnology is an evolving one with many risks and uncertainties, and third parties may have blocking patents that could be used to prevent us from commercializing our patented XpressCF™ technology, platforms and product candidates and practicing our proprietary technology. Our issued patents and those that may issue in the future may be challenged, invalidated, or circumvented, which could limit our ability to stop competitors from marketing related platforms or product candidates or limit the length of the term of patent protection that we may have for our XpressCF™ technology, platforms and product candidates. In addition, the rights granted under any issued patents may not provide us with protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may independently develop similar technologies. For these reasons, we may have competition for our XpressCF™ technology, platforms and product candidates. Moreover, because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that, before any particular product candidate can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby reducing any advantage of the patent. For this and more comprehensive risks related to our proprietary technology, inventions, improvements, platforms and product candidates, please see the section entitled "Risk Factors—Risks Related to Intellectual Property."

We intend to file applications for trademark registrations in connection with our product candidates in various jurisdictions, including the United States. We have filed for trademark protection of the Sutro Biopharma mark, the XpressCF™ mark and the XpressCF+™ mark with the USPTO. XpressCF™ refers to our cell-free protein synthesis technology as a whole, and XpressCF+™ refers specifically to cell-free protein synthesis incorporating one or more non-natural amino acids. The Sutro Biopharma mark was registered by the USPTO in 2014 and the XpressCF™ and XpressCF+™ marks were registered by the USPTO in 2017.

We also rely on trade secret protection for our confidential and proprietary information. Although we take steps to protect our confidential and proprietary information as trade secrets, including through contractual means with our employees and consultants, third parties may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets or disclose our technology. Thus, we may not be able to meaningfully protect our trade secrets. It is our policy to require our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us. These agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of employees, the agreements provide that all inventions conceived by the individual, and which are related to our current or planned business or research and development or made during normal working hours, on our premises or using our equipment or proprietary information, are our exclusive property. In many cases our confidentiality and other agreements with consultants, outside scientific collaborators, sponsored researchers and other advisors require them to assign or grant us licenses to inventions they invent as a result of the work or services they render under such agreements or grant us an option to negotiate a license to use such inventions.

We also seek to preserve the integrity and confidentiality of our proprietary technology and processes by maintaining physical security of our premises and physical and electronic security of our information technology systems. Although we have confidence in these individuals, organizations, and systems, agreements or security measures may be breached, and we may not have adequate remedies for any breach. To the extent that our employees, contractors, consultants, collaborators, and advisors use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Government Regulation

Government authorities in the United States, at the federal, state and local level, and in other countries and jurisdictions extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, post-approval monitoring and reporting, and import and export of pharmaceutical products. The processes for obtaining regulatory approvals in the United States and in foreign countries and jurisdictions, along with subsequent compliance with applicable statutes and regulations and other regulatory authorities, require the expenditure of substantial time and financial resources.

FDA Approval Process

In the United States, pharmaceutical products are subject to extensive regulation by the FDA. The Federal Food, Drug, and Cosmetic Act, or the FDC Act, and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, post-approval monitoring and reporting, sampling, and import and export of pharmaceutical products. Biological products used for the prevention, treatment, or cure of a disease or condition of a human being are subject to regulation under the FDC Act, except the section of the FDC Act which governs the approval of new drug applications, or NDAs. Biological products are approved for marketing under provisions of the Public Health Service Act, or PHS Act, via a Biologics License Application, or BLA. However, the application process and requirements for approval of BLAs are very similar to those for NDAs, and biologics are associated with similar approval risks and costs as drugs. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions, such as clinical hold, FDA refusal to approve pending BLAs, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties, and criminal prosecution.

Biological product development for a new product or certain changes to an approved product in the United States typically involves preclinical laboratory and animal tests, the submission to the FDA of an investigational new drug application, or IND, which must become effective before clinical testing may commence, and adequate and well-controlled clinical trials to establish the safety and effectiveness of the biologic for each indication for which FDA approval is sought. Satisfaction of FDA pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity, and novelty of the product or disease.

Preclinical tests include laboratory evaluation of product chemistry, formulation, and toxicity, as well as animal trials to assess the characteristics and potential safety and efficacy of the product. The conduct of the preclinical tests must comply with federal regulations and requirements, including good laboratory practices. The results of preclinical testing are submitted to the FDA as part of an IND along with other information, including information about product chemistry, manufacturing and controls, and a proposed clinical trial protocol. Long-term preclinical tests, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted. A 30-day waiting period after the submission of each IND is required prior to the commencement of clinical testing in humans. If the FDA has neither commented on nor questioned the IND within this 30-day period, the clinical trial proposed in the IND may begin. Clinical trials involve the administration of the investigational biologic to healthy volunteers or patients under the supervision of a qualified investigator. Clinical trials must be conducted: (i) in compliance with federal regulations; (ii) in compliance with good clinical practice, or GCP, an international standard meant to protect the rights and health of patients and to define the roles of clinical trial sponsors, administrators, and monitors; as well as (iii) under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. Each protocol involving testing on U.S. patients and subsequent protocol amendments must be submitted to the FDA as part of the IND.

The FDA may order the temporary, or permanent, discontinuation of a clinical trial at any time, or impose other sanctions, if it believes that the clinical trial either is not being conducted in accordance with FDA requirements or presents an unacceptable risk to the clinical trial patients. The trial protocol and informed consent information for patients in clinical trials must also be submitted to an institutional review board, or IRB, for approval. An IRB may also require the clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the IRB's requirements, or may impose other conditions.

Clinical trials to support BLAs for marketing approval are typically conducted in three sequential phases, but the phases may overlap. In Phase 1, the initial introduction of the biologic into healthy human subjects or patients, the product is tested to assess metabolism, pharmacokinetics, pharmacological actions, side effects associated with increasing doses, and, if possible, early evidence on effectiveness. In oncology clinical trials, efficacy endpoints are also often explored in Phase 1. Phase 2 usually involves trials in a limited patient population to determine the effectiveness of the drug or biologic for a particular indication, dosage tolerance, and optimum dosage, and to identify common adverse effects and safety risks. If a compound demonstrates evidence of effectiveness and an acceptable safety profile in Phase 2 evaluations, Phase 3 trials are undertaken to obtain the additional information about clinical efficacy and safety in a larger number of patients, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit-risk relationship of the drug or biologic and to provide adequate information for the labeling of the product. In some instances, trial phases may be truncated or combined into one or more combined-phase or adaptive design trials. In most cases, the FDA requires two adequate and well-controlled Phase 3 clinical trials to demonstrate the efficacy of the biologic. A single Phase 3 trial with other confirmatory evidence may be sufficient in certain oncological conditions where the trial is a large multicenter trial demonstrating internal consistency and a statistically very persuasive finding of a clinically meaningful effect on mortality, irreversible morbidity or prevention of a disease with a potentially serious outcome and confirmation of the result in a second trial would be practically or ethically impossible.

The manufacturer of an investigational drug in a Phase 2 or 3 clinical trial for a serious or life-threatening disease is required to make available, such as by posting on its website, its policy on evaluating and responding to requests for expanded access.

After completion of the required clinical testing, a BLA is prepared and submitted to the FDA. FDA approval of the BLA is required before marketing of the product may begin in the United States. The BLA must include the results of all preclinical, clinical, and other testing and a compilation of data relating to the product's pharmacology, chemistry, manufacture, and controls. The cost of preparing and submitting a BLA is substantial. The submission of most BLAs is additionally subject to a substantial application user fee, currently exceeding $2,588,000 for Fiscal Year 2019. The applicant under an approved BLA is also subject to an annual program fee, currently exceeding $309,000 per prescription drug product for Fiscal Year 2019. Beginning in Fiscal Year 2018, this annual program fee replaced the annual product and establishment fees. These fees are typically increased annually. The FDA has 60 days from its receipt of a BLA to determine whether the application will be accepted for filing based on the agency's threshold determination that it is sufficiently complete to permit substantive review. Once the submission is accepted for filing, the FDA begins an in-depth review. The FDA has agreed to certain performance goals in the review of BLAs. Most such applications for standard review biologic products are reviewed within 10 months of the date the FDA files the BLA; most applications for priority review biologics are reviewed within six months of the date the FDA files the BLA. Priority review can be applied to a biologic that the FDA determines has the potential to treat a serious or life-threatening condition and, if approved, would be a significant improvement in safety or effectiveness compared to available therapies. The review process for both standard and priority review may be extended by the FDA for three additional months to consider certain late-submitted information, or information intended to clarify information already provided in the submission.

The FDA may also refer applications for novel biologic products, or biologic products that present difficult questions of safety or efficacy, to an advisory committee—typically a panel that includes clinicians and other experts—for review, evaluation, and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. Additionally, the FDA will inspect the facility or the facilities at which the biologic product is manufactured. The FDA will not approve the product unless compliance with current Good Manufacturing Practices, or cGMPs, is satisfactory and the BLA contains data that provide substantial evidence that the biologic is safe, pure, potent and effective in the indication studied.

After the FDA evaluates the BLA and the manufacturing facilities, it issues either an approval letter or a complete response letter. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing, or information, in order for the FDA to reconsider the application. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the BLA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included. An approval letter authorizes commercial marketing of the biologic with specific prescribing information for specific indications. As a condition of BLA approval, the FDA may require a risk evaluation and mitigation strategy, or REMS, to help ensure that the benefits of the biologic outweigh the potential risks. REMS can include medication guides, communication plans for healthcare professionals, and elements to assure safe use, or ETASU. ETASU can include, but are not limited to, special training or certification for prescribing or dispensing, dispensing only under certain circumstances, special monitoring, and the use of patient registries. The requirement for a REMS can materially affect the potential market and profitability of the product. Moreover, product approval may require substantial post-approval testing and surveillance to monitor the product's safety or efficacy.

Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing. Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and FDA approval of a new BLA or BLA supplement before the change can be implemented. A BLA supplement for a new indication typically requires clinical data similar to that in the original application, and the FDA uses the same procedures and actions in reviewing BLA supplements as it does in reviewing BLAs.

Fast Track Designation and Accelerated Approval

The FDA is required to facilitate the development, and expedite the review, of biologics that are intended for the treatment of a serious or life-threatening disease or condition for which there is no effective treatment and which demonstrate the potential to address unmet medical needs for the condition. Under the fast track program, the sponsor of a new biologic candidate may request that the FDA designate the candidate for a specific indication as a fast track biologic concurrent with, or after, the filing of the IND for the candidate. The FDA must determine if the biologic candidate qualifies for fast track designation within 60 days of receipt of the sponsor's request. Under the fast track program and FDA's accelerated approval regulations, the FDA may approve a biologic for a serious or life-threatening illness that provides meaningful therapeutic benefit to patients over existing treatments based upon 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.

In clinical trials, a surrogate endpoint is a measurement of laboratory or clinical signs of a disease or condition that substitutes for a direct measurement of how a patient feels, functions, or survives. Surrogate endpoints can often be measured more easily or more rapidly than clinical endpoints. A biologic candidate approved on this basis is subject to rigorous post-marketing compliance requirements, including the completion of Phase 4 or post-approval clinical trials to confirm the effect on the clinical endpoint. Failure to conduct required post-approval trials, or confirm a clinical benefit during post-marketing trials, will allow the FDA to withdraw the biologic from the market on an expedited basis. All promotional materials for biologic candidates approved under accelerated regulations are subject to prior review by the FDA.

In addition to other benefits such as the ability to use surrogate endpoints and engage in more frequent interactions with the FDA, the FDA may initiate review of sections of a fast track product's BLA before the application is complete. This rolling review is available if the applicant provides, and the FDA approves, a schedule for the submission of the remaining information and the applicant pays applicable user fees. However, the FDA's time period goal for reviewing an application does not begin until the last section of the BLA is submitted. Additionally, the fast track designation may be withdrawn by the FDA if the FDA believes that the designation is no longer supported by data emerging in the clinical trial process.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan drug designation to biological products intended to treat a rare disease or condition—generally a disease or condition that affects fewer than 200,000 individuals in the United States, or if it affects more than 200,000 individuals in the United States, there is no reasonable expectation that the cost of developing and making a product available in the United States for such disease or condition will be recovered from sales of the product. In October 2018, we were granted Orphan Drug Designation by the FDA, for STRO-001 for the treatment of multiple myeloma.

Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the biological product and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first BLA applicant to receive FDA approval for a product with particular principal molecular structural features to treat a particular disease with FDA orphan drug designation is entitled to a seven-year exclusive marketing period in the United States for that product for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market a biological product containing the same active moiety for the same disease, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity. A product is clinically superior if it is safer, more effective or makes a major contribution to patient care. Orphan drug exclusivity does not prevent the FDA from approving a different drug or biological product for the same disease or condition, or the same biological product 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 user fee.

Disclosure of Clinical Trial Information

Sponsors of clinical trials of FDA-regulated products, including biological products, are required to register and disclose certain clinical trial information. Information related to the product, patient population, phase of investigation, trial sites and investigators, and other aspects of the clinical trial are then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed in certain circumstances for up to two years after the date of completion of the trial. Competitors may use this publicly available information to gain knowledge regarding the progress of development programs.

Pediatric Information

Under the Pediatric Research Equity Act, or PREA, BLAs or supplements to BLAs must contain data to assess the safety and effectiveness of the biological product for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the biological product is safe and effective. The FDA may grant full or partial waivers, or deferrals, for submission of data. Unless otherwise required by regulation, PREA does not apply to any biological product for an indication for which orphan designation has been granted, except a product with a new active ingredient that is molecularly targeted cancer product intended for the treatment of an adult cancer and directed at a molecular target determined by FDA to be substantially relevant to the growth or progression of a pediatric cancer that is subject to an NDA or BLA submitted on or after August 18, 2020.

Additional Controls for Biologics

To help reduce the increased risk of the introduction of adventitious agents, the PHS Act emphasizes the importance of manufacturing controls for products whose attributes cannot be precisely defined. The PHS Act also provides authority to the FDA to immediately suspend licenses in situations where there exists a danger to public health, to prepare or procure products in the event of shortages and critical public health needs, and to authorize the creation and enforcement of regulations to prevent the introduction or spread of communicable diseases in the United States and between states.

After a BLA is approved, the product may also be subject to official lot release as a condition of approval. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. The FDA may also perform certain confirmatory tests on lots of some products, such as viral vaccines, before releasing the lots for distribution by the manufacturer. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency, and effectiveness of biological products. As with drugs, after approval of biologics, manufacturers must address any safety issues that arise, are subject to recalls or a halt in manufacturing, and are subject to periodic inspection after approval.

Post-Approval Requirements

Once a BLA is approved, a product will be subject to certain post-approval requirements. For instance, the FDA closely regulates the post-approval marketing and promotion of biologics, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet. Biologics may be marketed only for the approved indications and in accordance with the provisions of the approved labeling.

Adverse event reporting and submission of periodic reports is required following FDA approval of a BLA. The FDA also may require post-marketing testing, known as Phase 4 testing, REMS, and surveillance to monitor the effects of an approved product, or the FDA may place conditions on an approval that could restrict the distribution or use of the product. In addition, quality control, biological product manufacture, packaging, and labeling procedures must continue to conform to cGMPs after approval. Biologic manufacturers and certain of their subcontractors are required to register their establishments with the FDA and certain state agencies. Registration with the FDA subjects entities to periodic unannounced inspections by the FDA, during which the agency inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to expend time, money, and effort in the areas of production and quality-control to maintain compliance with cGMPs. Regulatory authorities may withdraw product approvals or request product recalls if a company fails to comply with regulatory standards, if it encounters problems following initial marketing, or if previously unrecognized problems are subsequently discovered.

FDA Regulation of Companion Diagnostics

A biologic product may rely upon an *in vitro* companion diagnostic for use in selecting the patients that will respond to a therapy. If an *in vitro* diagnostic is essential to the safe and effective use of the therapeutic product, then the FDA generally will require approval or clearance of the diagnostic at the same time that FDA approves the therapeutic product.

Pursuing FDA approval of an *in vitro* companion diagnostic usually would require a pre-market approval, or PMA, for that diagnostic. Based on a final FDA guidance document, and the FDA's past treatment of companion diagnostics, the FDA will likely require PMA approval of an *in vitro* companion diagnostics to identify patient populations suitable for a cancer therapy. The review of these *in vitro* companion diagnostics involves coordination of review by the FDA's Center for Biologics Evaluation and Research and by the FDA's Center for Devices and Radiological Health. Approval of a companion diagnostic is generally required at the time of new drug approval.

The PMA process, including the gathering of clinical and nonclinical data and the submission to and review by the FDA, can take several years or longer. The applicant must prepare and provide the FDA with reasonable assurance of the device's safety and effectiveness, including information about the device and its components regarding, among other things, device design, manufacturing and labeling. PMA applications are subject to an application fee, which exceeds $322,000 for most PMAs for Fiscal Year 2019. In addition, PMAs for devices must generally include the results from extensive preclinical and adequate and well-controlled clinical trials to establish the safety and effectiveness of the device for each indication for which FDA approval is sought. In particular, for a diagnostic, the applicant must demonstrate that the diagnostic produces reproducible results between multiple users at multiple laboratories. As part of the PMA review, the FDA will typically inspect the manufacturer's facilities for compliance with the Quality System Regulation, or QSR, which imposes elaborate testing, control, documentation and other quality assurance requirements.

PMA approval is not guaranteed, and the FDA may ultimately respond to a PMA submission with a not approvable determination based on deficiencies in the application and require additional clinical trial or other data that may be expensive and time consuming to generate and that can substantially delay or prevent approval. If the FDA concludes that the applicable criteria have been met, the FDA will issue a PMA for the approved indications, which can be more limited than those originally sought by the applicant. The PMA can include post-approval conditions that the FDA believes necessary to ensure the safety and effectiveness of the device, including, among other things, restrictions on labeling, promotion, sale and distribution.

After a device is placed on the market, it remains subject to significant regulatory requirements. Medical devices may be marketed only for the uses and indications for which they are cleared or approved. Device manufacturers must also register with FDA and list their devices. A medical device manufacturer's manufacturing processes are required to comply with the applicable portions of the QSR, which cover the methods and documentation of the design, testing, production, processes, controls, quality assurance, labeling, packaging and shipping of medical devices. Domestic facility records and manufacturing processes are subject to periodic inspections by the FDA.

Failure to comply with applicable regulatory requirements can result in enforcement action by the FDA, which may include any of the following sanctions: warning or untitled letters, fines, injunctions, civil or criminal penalties, recall or seizure of current or future products, operating restrictions, partial suspension or total shutdown of production, denial of submissions for new products, or withdrawal of PMA approvals.

Other Healthcare Laws

In addition to FDA restrictions on marketing of pharmaceutical products, several other types of state and federal laws have been applied to restrict certain general business and marketing practices in the pharmaceutical industry in recent years. These laws include anti-kickback statutes, false claims statutes and other healthcare laws and regulations.

The federal Anti-Kickback Statute prohibits, among other things, knowingly and willfully offering, paying, soliciting or receiving remuneration to induce, or in return for, purchasing, leasing, ordering or arranging for the purchase, lease or order of any healthcare item or service reimbursable under Medicare, Medicaid, or other federally financed healthcare programs. The Patient Protection and Affordable Care Act as amended by the Health Care and Education Reconciliation Act, collectively, the ACA, amended the intent element of the federal statute so that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to commit a violation. This statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers and formulary managers on the other. Although there are a number of statutory exceptions and regulatory safe harbors protecting certain common activities from prosecution or other regulatory sanctions, the exceptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exception or safe harbor.

Federal civil and criminal false claims laws, including the federal civil False Claims Act, prohibit any person or entity from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, or knowingly making, or causing to be made, a false statement to have a false claim paid. This includes claims made to programs where the federal government reimburses, such as Medicaid, as well as programs where the federal government is a direct purchaser, such as when it purchases off the Federal Supply Schedule. Recently, several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly inflating drug prices they report to pricing services, which in turn were used by the government to set Medicare and Medicaid reimbursement rates, and for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. In addition, certain marketing practices, including off-label promotion, may also violate false claims laws. Additionally, the ACA amended the federal Anti-Kickback Statute such that a violation of that statute can serve as a basis for liability under the federal False Claims Act. The majority of states also have statutes or regulations similar to the federal Anti-Kickback Statute and False Claims Act, which apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

Other federal statutes pertaining to healthcare fraud and abuse include the civil monetary penalties statute, which prohibits, among other things, the offer or payment of remuneration to a Medicaid or Medicare beneficiary that the offerer or payor knows or should know is likely to influence the beneficiary to order a receive a reimbursable item or service from a particular supplier, and the additional federal criminal statutes created by the Health Insurance Portability and Accountability Act of 1996, or HIPAA, which prohibits, among other things, knowingly and willfully executing or attempting to execute a scheme to defraud any healthcare benefit program or obtain by means of false or fraudulent pretenses, representations or promises any money or property owned by or under the control of any healthcare benefit program in connection with the delivery of or payment for healthcare benefits, items or services.

In addition, HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, imposes obligations on certain healthcare providers, health plans, and healthcare clearinghouses, known as covered entities, as well as their business associates that perform certain services involving the storage, use or disclosure of individually identifiable health information, including mandatory contractual terms, with respect to safeguarding the privacy, security, and transmission of individually identifiable health information, and require notification to affected individuals and regulatory authorities of certain breaches of security of individually identifiable health information.

Further, pursuant to the ACA, the Centers for Medicare & Medicaid Services, or CMS, has issued a final rule that requires manufacturers of prescription drugs to collect and report information on certain payments or transfers of value to physicians and teaching hospitals, as well as investment interests held by physicians and their immediate family members. The reports must be submitted on an annual basis and the reported data are posted in searchable form on a public website on an annual basis. Failure to submit required information may result in civil monetary penalties. Effective January 1, 2022, transfers of value to physician assistants, nurse practitioners or clinical nurse specialists, certified registered nurse anesthetists, and certified nurse-midwives must also be reported.

In addition, several states now require prescription drug companies to report certain expenses relating to the marketing and promotion of drug products and to report gifts and payments to individual healthcare practitioners in these states. Other states prohibit various marketing-related activities, such as the provision of certain kinds of gifts or meals. Still other states require the posting of information relating to clinical studies and their outcomes. Some states require the reporting of certain pricing information, including information pertaining to and justifying price increases, or prohibit prescription drug price gouging. In addition, states such as California, Connecticut, Nevada, and Massachusetts require pharmaceutical companies to implement compliance programs and/or marketing codes. Additional jurisdictions, such as the City of Chicago and the District of Columbia, require pharmaceutical sales representatives to be licensed and meet continuing education requirements. Several additional states are considering similar proposals. Certain states and local jurisdictions also require the registration of pharmaceutical sales representatives. Compliance with these laws is difficult and time consuming, and companies that do not comply with these state laws face civil penalties.

Efforts to ensure that business arrangements with third parties comply with applicable healthcare laws and regulations involve substantial costs. If a drug company's operations are found to be in violation of any such requirements, it may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, the curtailment or restructuring of its operations, loss of eligibility to obtain approvals from the FDA, exclusion from participation in government contracting, healthcare reimbursement or other government programs, including Medicare and Medicaid, integrity oversight and reporting obligations and reputational harm. Although effective compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, these risks cannot be entirely eliminated. Any action for an alleged or suspected violation can cause a drug company to incur significant legal expenses and divert management's attention from the operation of the business, even if such action is successfully defended.

U.S. Healthcare Reform

In the United States, there have been, and continue to be, proposals by the federal government, state governments, regulators and third-party payors to control or manage the increased costs of health care and, more generally, to reform the U.S. healthcare system. For example, in March 2010, the ACA was enacted, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The ACA, among other things, (i) subjected therapeutic biologics to potential competition by lower-cost biosimilars by creating a licensure framework for follow-on biologic products, (ii) proscribed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs and therapeutic biologics that are inhaled, infused, instilled, implanted or injected, (iii) increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extended the rebate program to individuals enrolled in Medicaid managed care organizations, (iv) established annual fees and taxes on manufacturers of certain branded prescription drugs and therapeutic biologics, (v) established a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices (increased to 70% beginning in 2019) of applicable brand drugs and therapeutic biologics to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs and therapeutic biologics to be covered under Medicare Part D, (vi) expanded eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability, (vii) expanded the entities eligible for discounts under the Public Health program (viii) created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research, and (ix) established a Center for Medicare Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

The current U.S. presidential administration and Congress have, and we expect they will continue to, seek to modify, repeal, or otherwise invalidate all, or certain provisions of, the ACA. Since January 2017, the current U.S. presidential administration has issued two executive orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. For example, on October 12, 2017, the current U.S. presidential administration issued an executive order that expands the use of association health plans and allows anyone to purchase short-term health plans that provide temporary, limited insurance. This executive order also calls for the halt of federal payments to health insurers for cost-sharing reductions previously available to lower-income Americans to afford coverage. There is still uncertainty with respect to the impact this executive order could have on coverage and reimbursement for healthcare items and services covered by plans that were authorized by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017, among other things, 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 January 22, 2018, the current U.S. presidential administration signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, or the BBA, among other things, amends the ACA, effective January 1, 2019, to increase from 50 percent to 70 percent the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole". More recently, in July 2018, CMS published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. There is still uncertainty with respect to the impact the current U.S. presidential administration and the Congress may have, if any, and any changes will likely take time to unfold, and could have an impact on coverage and reimbursement for healthcare items and services covered by plans that were authorized by the ACA. However, we cannot predict the ultimate content, timing or effect of any healthcare reform legislation or the impact of potential legislation on us.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted to reduce healthcare expenditures. U.S. federal government agencies also currently face potentially significant spending reductions, which may further impact healthcare expenditures. On August 2, 2011, the Budget Control Act of 2011 among other things, created measures for spending reductions by Congress. A joint select committee on deficit reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year. These reductions went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. Moreover, on January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, 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. If federal spending is further reduced, anticipated budgetary shortfalls may also impact the ability of relevant agencies, such as the FDA or the National Institutes of Health to continue to function at current levels. Amounts allocated to federal grants and contracts may be reduced or eliminated. These reductions, as well as potential future shutdowns of the U.S. federal government, may also impact the ability of relevant agencies to timely review and approve research and development, manufacturing, and marketing activities, which may delay our ability to develop, market and sell any products we may develop.

Moreover, payment methodologies, including payment for companion diagnostics, may be subject to changes in healthcare legislation and regulatory initiatives. For example, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or MMA, changed the way Medicare covers and pays for pharmaceutical products. The legislation expanded Medicare coverage for drug purchases by the elderly and introduced a new reimbursement methodology based on average sales prices for physician-administered drugs. In addition, this legislation provided authority for limiting the number of drugs that will be covered in any therapeutic class. While the MMA only applies to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates. Therefore, any reduction in reimbursement that results from the MMA may result in a similar reduction in payments from private payors. In addition, CMS has begun bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting and, beginning in 2018, CMS will pay for clinical laboratory services based on a weighted average of reported prices that private payors, Medicare Advantage plans, and Medicaid Managed Care plans pay for laboratory services. Further, on March 16, 2018, CMS finalized its National Coverage Determination, or NCD, for certain diagnostic laboratory tests using next generation sequencing, or NGS, that are approved by the FDA as a companion in vitro diagnostic and used in a cancer with an FDA-approved companion diagnostic indication. Under the NCD, diagnostic tests that gain FDA approval or clearance as an in vitro companion diagnostic will automatically receive full coverage and be available for patients with recurrent, metastatic relapsed, refractory or stages III and IV cancer. Additionally, the NCD extended coverage to repeat testing when the patient has a new primary diagnosis of cancer.

Recently there has 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 and enacted federal and state legislation 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. At the federal level, the current U.S. presidential administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, on May 11, 2018, the current U.S. presidential administration laid out the administration's "Blueprint" to reduce the cost of prescription medications while preserving innovation and cures. While the Department of Health and Human Services, or HHS, is soliciting feedback on some of these measures, other actions may be immediately implemented by HHS under existing authority. Although a number of these, and other potential, proposals will require authorization through additional legislation to become effective, Congress and the current U.S. presidential administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures are increasingly 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.

Additionally, on May 30, 2018, the Trickett Wendler, Frank Mongiello, Jordan McLinn, and Matthew Bellina Right to Try Act of 2017 was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug products that have completed a Phase I clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA authorization under an FDA expanded access program.

Employees

As of December 31, 2018, we had 147 full-time employees, 9 full-time contract employees and 2 part-time contract employees. Of these employees, 41 have an M.D. or a Ph.D. None of our employees are represented by a labor union or covered by collective bargaining agreements, and we believe our relationship with our employees is good.

Corporate Information

We were incorporated under the laws of the State of Delaware in April 2003 under the name Fundamental Applied Biology, Inc. We subsequently changed our name to Sutro Biopharma, Inc. Our principal executive offices are located at 310 Utah Avenue, Suite 150, South San Francisco, California 94080, and our telephone number is (650) 392-8412. Our website address is www.sutrobio.com. The information contained on, or that can be accessed through, our website is not part of, and is not incorporated by reference into, this report.

Available Information

We file annual, quarterly and current reports, proxy statements and other documents with the Securities and Exchange Commission, or SEC, under the Securities Exchange Act of 1934, as amended, or Exchange Act. The SEC maintains an Internet website that contains reports, proxy and information statements, and other information regarding issuers, including us, that file electronically with the SEC. The public can obtain any documents that we file with the SEC at www.sec.gov. Copies of each of our filings with the SEC can also be viewed and downloaded free of charge at our website, ir.sutrobio.com, after the reports and amendments are electronically filed with or furnished to the SEC.

Item 1A. *Risk Factors*

Investing in our common stock involves a high degree of risk. Before making your decision to invest in shares of our common stock, you should carefully consider the risks described below, together with the other information contained in this annual report, including our financial statements and the related notes and "Management's Discussion and Analysis of Financial Condition and Results of Operations". The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties that we are unaware of, or that we currently believe are not material, may also become important factors that affect us. We cannot assure you that any of the events discussed below will not occur. These events could have a material and adverse impact on our business, financial condition, results of operations and prospects. If that were to happen, the trading price of our common stock could decline, and you could lose all or part of your investment.

Risks Related to Our Business

We are a clinical stage biopharmaceutical company with a limited operating history and no products approved for commercial sale. We have a history of significant losses, expect to continue to incur significant losses for the foreseeable future and may never achieve or maintain profitability, which could result in a decline in the market value of our common stock.

We are a clinical stage biopharmaceutical company with a limited operating history on which to base your investment decision. Biotechnology product development is a highly speculative undertaking and involves a substantial degree of risk.

To date, we have enrolled a limited number of patients in our initial clinical trials, evaluating the safety of our first and second clinical stage product candidates, STRO-001 and STRO-002, have no products approved for commercial sale, have not generated any revenue from commercial product sales and, as of December 31, 2018, had an accumulated deficit of $150.3 million. For the year ended December 31, 2018 and 2017, our net loss was $35.3 million and $19.7 million, respectively, and for the year ended December 31, 2016, our net income was $1.7 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. Our technologies and product candidates are in early stages of development, and we are subject to the risks of failure inherent in the

development of product candidates based on novel technologies. In addition, we have limited experience as a clinical stage company 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 biotechnology industry. Furthermore, we do not expect to generate any revenue from commercial product sales for the foreseeable future, and we expect to continue to incur significant operating losses for the foreseeable future due to the cost of research and development, preclinical studies and clinical trials and the regulatory approval process for our product candidates. We expect our net losses to increase substantially as we progress further into clinical development of our lead programs and create additional infrastructure to support operations as a public company. However, the amount of our future losses is uncertain. Our ability to achieve profitability, if ever, will depend on, among other things, our, or our existing or future collaborators', successful development of product candidates, evaluating the related commercial opportunities, obtaining regulatory approvals to market and commercializing product candidates, manufacturing any approved products on commercially reasonable terms, establishing a sales and marketing organization or suitable third-party alternatives for any approved product and raising sufficient funds to finance business activities. If we, or our existing or future collaborators, are unable to develop our technologies and commercialize one or more of our product candidates or if sales revenue from any product candidate that receives approval is insufficient, we will not achieve profitability, which could have a material and adverse effect on our business, financial condition, results of operations and prospects. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods.

We will need substantial additional funds to advance development of our product candidates. This additional financing may not be available on acceptable terms, or at all. Failure to obtain this necessary capital when needed may force us to delay, limit or terminate our product development programs, commercialization efforts or other operations.

The development of biopharmaceutical product candidates is capital-intensive. If our product candidates enter and advance through preclinical studies and clinical trials, we will need substantial additional funds to expand our development, regulatory, manufacturing, marketing and sales capabilities. We have used substantial funds to develop our technology and product candidates and will require significant funds to conduct further research and development and preclinical testing and clinical trials of our product candidates, to seek regulatory approvals for our product candidates and to manufacture and market products, if any, which are approved for commercial sale. In addition, we expect to incur additional costs associated with operating as a public company.

Since our inception, we have invested a significant portion of our efforts and financial resources in research and development activities for our two product candidates STRO-001, our initial clinical program, and STRO-002, our second clinical program, and the development of our in-house manufacturing capabilities. Clinical trials for our product candidates will require substantial funds to complete. As of December 31, 2018, we had $204.5 million in cash, cash equivalents and marketable securities. We expect to incur substantial expenditures in the foreseeable future as we seek to advance STRO-001 and STRO-002 and any future product candidates through clinical development, manufacturing, the regulatory approval process and, if approved, commercial launch activities, as well as in connection with the continued development of our manufacturing capabilities. Based on our current operating plan, we believe that our available cash, cash equivalents and marketable securities will be sufficient to fund our operations through at least the next 12 months. However, our future capital requirements and the period for which we expect our existing resources to support our operations may vary significantly from what we expect and we may need to seek additional funds sooner than planned. Our monthly spending levels vary based on new and ongoing research and development and other corporate activities. Because the length of time and activities associated with successful research and development of our product candidates is highly uncertain, we are unable to estimate the actual funds we will require for development and any marketing and commercialization activities for approved products. The timing and amount of our operating expenditures will depend largely on:

- the timing and progress of preclinical and clinical development activities;
- the costs associated with the development of our internal manufacturing facility and processes;
- the number and scope of preclinical and clinical programs we decide to pursue;
- the progress of the development efforts of parties with whom we have entered or may in the future enter into collaborations and research and development agreements;
- the timing and amount of milestone and other payments we may receive under our collaboration agreements;

- our ability to maintain our current licenses and research and development programs and to establish new collaboration arrangements;
- the costs involved in prosecuting and enforcing patent and other intellectual property claims;
- the costs of manufacturing our product candidates and those of our collaborators using our proprietary XpressCF+™ Platform;
- the cost and timing of regulatory approvals;
- the cost of commercialization activities if our product candidates or any future product candidates are approved for sale, including marketing, sales and distribution costs; and
- our efforts to enhance operational systems and hire additional personnel, including personnel to support development of our product candidates and satisfy our obligations as a public company.

If we are unable to obtain funding on a timely basis or on acceptable terms, we may have to delay, reduce or terminate our research and development programs and preclinical studies or clinical trials, limit strategic opportunities or undergo reductions in our workforce or other corporate restructuring activities. We also could be required to seek funds through arrangements with collaborators or others that may require us to relinquish rights to some of our technologies or product candidates that we would otherwise pursue on our own. We do not expect to realize revenue from sales of commercial products or royalties from licensed products in the foreseeable future, if at all, and, in no event, before our product candidates are clinically tested, approved for commercialization and successfully marketed. To date, we have primarily financed our operations through payments received under our collaboration agreements, the sale of equity securities and debt financing. We will be required to seek additional funding in the future and currently intend to do so through additional collaborations and/or licensing agreements, 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. Additional funds may not be available to us on acceptable terms or at all. Subject to limited exceptions, the loan and security agreement, or the Loan and Security Agreement, we entered into with Oxford and SVB in August 2017 under which we borrowed $15.0 million prohibits us from incurring indebtedness without the prior written consent of Oxford or SVB. 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. If we raise additional funds through licensing or collaboration arrangements with third parties, we may have to relinquish valuable rights to our product candidates, or grant licenses on terms that are not favorable to us. 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. Our current debt financing involves, and future debt financings, if available, are 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 receive any distribution of our corporate assets. Failure to obtain capital when needed on acceptable terms may force us to delay, limit or terminate our product development and commercialization of our current or future product candidates, which could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Our product candidates are in early stages of development and may fail in development or suffer delays that materially and adversely affect their commercial viability. If we or our collaborators are unable to complete development of or commercialize our product candidates or experience significant delays in doing so, our business will be materially harmed.

We have no products on the market and all of our product candidates for cancer therapy are in early stages of development. In particular, our most advanced product candidate, STRO-001, is in the initial stages of dose escalation in clinical trial patients. We began enrolling patients in a STRO-002 Phase 1 trial in March 2019. Additionally, we have programs that are in earlier stages of discovery and preclinical development and may never advance to clinical-stage development. Our ability to achieve and sustain profitability depends on obtaining regulatory approvals for and successfully commercializing our product candidates, either alone or with third parties, and we cannot guarantee you that we will ever obtain regulatory approval for any of our product candidates. We have limited experience in conducting and managing the clinical trials necessary to obtain regulatory approvals, including approval by the FDA. Before obtaining regulatory approval for the commercial distribution of our product candidates, we or an existing or future collaborator must conduct extensive preclinical tests and clinical trials to demonstrate the safety and efficacy in humans of our product candidates.

We may not have the financial resources to continue development of, or to modify existing or enter into new collaborations for, a product candidate if we experience any issues that delay or prevent regulatory approval of, or our ability to commercialize, product candidates, including:

- negative or inconclusive results from our clinical trials or the clinical trials of others for product candidates similar to ours, leading to a decision or requirement to conduct additional preclinical testing or clinical trials or abandon a program;
- product-related side effects experienced by patients in our clinical trials or by individuals using drugs or therapeutic biologics similar to our product candidates;
- difficulty achieving successful continued development of our internal manufacturing processes, including process development and scale-up activities to supply products for preclinical studies, clinical trials and commercial sale;
- our inability to transfer successfully our manufacturing expertise and techniques to third-party contract manufacturers;
- inability of us or any third-party contract manufacturer to scale up manufacturing of our product candidates and those of our collaborators to supply the needs of clinical trials and commercial sales, and to manufacture such products in conformity with regulatory requirements using our proprietary XpressCF™ Platform;
- delays in submitting investigational new drug applications, or INDs, or comparable foreign applications or delays or failures in obtaining the necessary approvals from regulators to commence a clinical trial, or a suspension or termination of a clinical trial once commenced;
- conditions imposed by the FDA or comparable foreign authorities regarding the scope or design of our clinical trials;
- delays in enrolling patients in our clinical trials;
- high drop-out rates of our clinical trial patients;
- inadequate supply or quality of product candidate components or materials or other supplies necessary for the conduct of our clinical trials;
- inability to obtain alternative sources of supply for which we have a single source for product candidate components or materials;
- greater than anticipated costs of our clinical trials;
- harmful side effects or inability of our product candidates to meet efficacy endpoints during clinical trials;
- failure to demonstrate a benefit-risk profile acceptable to the FDA or other regulatory agencies;
- unfavorable FDA or other regulatory agency inspection and review of one or more of our clinical trial sites or manufacturing facilities;
- failure of our third-party contractors or investigators to comply with regulatory requirements or otherwise meet their contractual obligations in a timely manner, or at all;
- delays and changes in regulatory requirements, policy and guidelines, including the imposition of additional regulatory oversight around clinical testing generally or with respect to our technology in particular; or
- varying interpretations of our data by the FDA and similar foreign regulatory agencies.

We or our collaborators' inability to complete development of or commercialize our product candidates or significant delays in doing so due to one or more of these factors, could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Our business is dependent on the success of our product candidates based on our proprietary XpressCF™ Platform and, in particular, our lead product candidates, STRO-001 and STRO-002. Existing and future preclinical studies and clinical trials of our product candidates may not be successful. If we are unable to commercialize our product candidates or experience significant delays in doing so, our business will be materially harmed.

We have invested a significant portion of our efforts and financial resources in the development of our proprietary XpressCF™ Platform and our lead product candidates, STRO-001 and STRO-002. Our ability to generate commercial product revenues, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of STRO-001 and STRO-002. We have not previously submitted a new drug application, or NDA, or a biologics license application, or BLA, to the FDA, or similar regulatory approval filings to comparable foreign authorities, for any product candidate, and we cannot be certain that our product candidates will be successful in clinical trials or receive regulatory approval. Further, our

product candidates may not receive regulatory approval even if they are successful in clinical trials. If we do not receive regulatory approvals for our product candidates, we may not be able to continue our operations. Even if we successfully obtain regulatory approvals to market our product candidates, our revenues will be dependent, in part, upon the size of the markets in the territories for which we gain regulatory approval and have commercial rights. If the markets for patient subsets that we are targeting are not as significant as we estimate, we may not generate significant revenues from sales of such products, if approved.

We plan to seek regulatory approval to commercialize our product candidates both in the United States and in selected foreign countries. While the scope of regulatory approvals generally is similar in other countries, in order to obtain separate regulatory approvals in other countries, we must comply with numerous and varying regulatory requirements of such countries regarding safety and efficacy. Other countries also have their own regulations governing, among other things, clinical trials and commercial sales, as well as pricing and distribution of our product candidates, and we may be required to expend significant resources to obtain regulatory approval and to comply with ongoing regulations in these jurisdictions.

The success of STRO-001 and STRO-002 and our other product candidates will depend on many factors, including the following:

- successful enrollment of patients in, and the completion of, our clinical trials;
- receiving required regulatory approvals for the development and commercialization of our product candidates;
- establishing our commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- obtaining and maintaining patent and trade secret protection and non-patent exclusivity for our product candidates and their components;
- enforcing and defending our intellectual property rights and claims;
- achieving desirable therapeutic properties for our product candidates' intended indications;
- launching commercial sales of our product candidates, if and when approved, whether alone or in collaboration with third parties;
- acceptance of our product candidates, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies; and
- maintaining an acceptable safety profile of our product candidates through clinical trials and following regulatory approval.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize our product candidates, which would materially harm our business.

Additionally, we have created a benchmark folate receptor-alpha, or FolRα, targeting ADC, using conventional technology that results in a heterogeneous ADC mixture. We have compared STRO-002 to this benchmark molecule in multiple preclinical models. We believe the results of these tests help us understand how the therapeutic index of STRO-002 compares to competitors. However, we cannot be certain that our benchmark molecule is the same as the molecule we are attempting to recreate, and the results of the tests comparing our benchmark molecule to STRO-002 may be different than the actual results of a head-to-head test of STRO-002 against a competitor molecule. Additional preclinical and clinical testing will be needed to evaluate the therapeutic index of STRO-002 and to understand its therapeutic potential relative to other product candidates in development. While we believe our ADCs may be superior to other investigative agents in development, without head-to-head comparative data, we will not be able to make claims of superiority to other products in our promotional materials, if our product candidates are approved.

If we do not achieve our projected development goals in the time frames we announce and expect, the commercialization of our products may be delayed and, as a result, our stock price may decline.

From time to time, we estimate the timing of the anticipated accomplishment of various scientific, clinical, regulatory and other product development goals, which we sometimes refer to as milestones. These milestones may include the commencement or completion of scientific studies and clinical trials and the submission of regulatory filings. From time to time, we may publicly announce the expected timing of some of these milestones. All of these milestones are and will be based on numerous assumptions. The actual timing of these milestones can vary dramatically compared to our estimates, in some cases for reasons beyond our control. If we do not meet these milestones as publicly announced, or at all, the commercialization of our products may be delayed or never achieved and, as a result, our stock price may decline.

Our approach to the discovery and development of our therapeutic treatments is based on novel technologies that are unproven and may not result in marketable products.

We are developing a pipeline of product candidates using our proprietary XpressCF™ Platform. We believe that product candidates identified with our product discovery platform may offer an improved therapeutic approach by taking advantage of precision design and rapid empirical optimization, thereby reducing the dose-limiting toxic effects associated with existing products. However, the scientific research that forms the basis of our efforts to develop product candidates based on our XpressCF™ Platform is ongoing. Further, the scientific evidence to support the feasibility of developing therapeutic treatments based on our XpressCF™ Platform is both preliminary and limited.

To date, we have tested our first clinical stage product candidates, STRO-001 and STRO-002, in a limited number of clinical trial patients. We may ultimately discover that our XpressCF™ Platform and any product candidates resulting therefrom do not possess certain properties required for therapeutic effectiveness. XpressCF™ product candidates may also be unable to remain stable in the human body for the period of time required for the drug to reach the target tissue or they may trigger immune responses that inhibit the ability of the product candidate to reach the target tissue or that cause adverse side effects in humans. We currently have only limited data, and no conclusive evidence, to suggest that we can introduce these necessary properties into these product candidates derived from our XpressCF™ Platform. We may spend substantial funds attempting to introduce these properties and may never succeed in doing so. In addition, product candidates based on our XpressCF™ Platform may demonstrate different chemical and pharmacological properties in patients than they do in laboratory studies. Although our XpressCF™ Platform and certain product candidates have produced successful results in animal studies, they may not demonstrate the same chemical and pharmacological properties in humans and may interact with human biological systems in unforeseen, ineffective or harmful ways. As a result, we may never succeed in developing a marketable product, we may not become profitable and the value of our common stock will decline.

The regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or extensively studied product candidates. We are not aware of any company currently developing a therapeutic using our approach to ADC development and no regulatory authority has granted approval for such a therapeutic. We believe the FDA has limited experience with therapeutics in oncology or other disease areas developed in cell-free-based synthesis systems, which may increase the complexity, uncertainty and length of the regulatory approval process for our product candidates. For example, our XpressCF™ ADC product candidates contain cleavable or non-cleavable linker-warhead combinations or novel warheads that may result in unforeseen events when administered in a human. We and our existing or future collaborators may never receive approval to market and commercialize any product candidate. Even if we or an existing or future collaborator obtains 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 or an existing or future collaborator may be required to perform additional or unanticipated clinical trials to obtain approval or be subject to post-marketing testing requirements to maintain regulatory approval. If the products resulting from our XpressCF™ Platform prove to be ineffective, unsafe or commercially unviable, our entire 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.

Results of preclinical studies and early clinical trials may not be predictive of results of future clinical trials.

The outcome of preclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of clinical trials do not necessarily predict success in future clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in earlier development, and we could face similar setbacks. The design of a clinical trial can determine whether its results will support approval of a product, and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. While certain relevant members of our company have significant clinical experience, we in general have limited experience in designing clinical trials and may be unable to design and execute a clinical trial to support marketing approval. In addition, preclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval for the product candidates. Even if we, or future collaborators, believe that the results of clinical trials for our product candidates warrant marketing approval, the FDA or comparable foreign regulatory authorities may disagree and may not grant marketing approval of our product candidates.

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

The market may not be receptive to our product candidates based on a novel therapeutic modality, and we may not generate any future revenue from the sale or licensing of product candidates.

Even if regulatory approval is obtained for a product candidate, we may not generate or sustain revenue from sales of the product due to factors such as whether the product can be sold at a competitive cost, competition in the therapeutic area(s) we have received or may receive approval for, and whether it will otherwise be accepted in the market. Historically, there have been concerns regarding the safety and efficacy of ADCs, and an ADC drug was voluntarily withdrawn from the market. These historical concerns may negatively impact the perception market participants have on ADCs, including our product candidates. Additionally, the product candidates that we are developing are based on our proprietary XpressCF™ Platform, which is a new technology. Market participants with significant influence over acceptance of new treatments, such as physicians and third- party payors, may not adopt an ADC product, or a product or treatment based on our novel cell-free production technologies, and we may not be able to convince the medical community and third-party payors to accept and use, or to provide favorable reimbursement for, any product candidates developed by us or our existing or future collaborators. Market acceptance of our product candidates will depend on, among other factors:

- the timing of our receipt of any marketing and commercialization approvals;
- the terms of any approvals and the countries in which approvals are obtained;
- the safety and efficacy of our product candidates;
- the prevalence and severity of any adverse side effects associated with our product candidates;
- limitations or warnings contained in any labeling approved by the FDA or other regulatory authority;
- relative convenience and ease of administration of our product candidates;
- the willingness of patients to accept any new methods of administration;
- the success of our physician education programs;
- the availability of coverage and adequate reimbursement from government and third-party payors;
- the pricing of our products, particularly as compared to alternative treatments; and
- the availability of alternative effective treatments for the disease indications our product candidates are intended to treat and the relative risks, benefits and costs of those treatments.

Because our product candidates are based on new technology, we expect that they will require extensive research and development and have substantial manufacturing and processing costs. In addition, our estimates regarding potential market size for any indication may be materially different from what we discover to exist at the time we commence commercialization, if any, for a product, which could result in significant changes in our business plan and have a material adverse effect on our business, financial condition, results of operations and prospects. Moreover, if any product candidate we commercialize fails to achieve market acceptance, it could have a material and adverse effect on our business, financial condition, results of operations and prospects.

We have entered, and may in the future seek to enter, into collaborations with third parties for the development and commercialization of our product candidates using our XpressCF™ Platform. If we fail to enter into such collaborations, or such collaborations are not successful, we may not be able to capitalize on the market potential of our XpressCF™ Platform and resulting product candidates.

Since 2014, we have entered into collaborations with Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, USA, or Merck, Celgene Corporation, or Celgene, and Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name "EMD Serono") to develop certain cancer and other therapeutics. In addition, we may in the future seek third-party collaborators for research, development and commercialization of other therapeutic technologies or product candidates. Biopharmaceutical companies are our prior and likely future collaborators for any marketing, distribution, development, licensing or broader collaboration arrangements. With respect to our existing collaboration agreements, and what we expect will be the case with any future collaboration agreements, we have and would expect to have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates. Moreover, our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates currently pose, and will continue to pose, the following risks to us:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not pursue development and commercialization of our product candidates or may elect not to continue or renew development or commercialization programs based on preclinical studies or clinical trial results, changes in the collaborators' strategic focus or available funding, or external factors such as an acquisition that diverts resources or creates competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- collaborators with marketing and distribution rights to one or more products may not commit sufficient resources to the marketing and distribution of such product or products;
- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to litigation or potential liability;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our product candidates or that result in costly litigation or arbitration that diverts management attention and resources; and
- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.

As a result of the foregoing, our current and any future collaboration agreements may not lead to development or commercialization of our product candidates in the most efficient manner or at all. Moreover, if a collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program could be delayed, diminished or terminated. For example, in January 2019, Bristol-Myers Squibb announced the entry into a definitive agreement to acquire Celgene, with the intent of creating a leading focused specialty biopharma company. The transaction is expected to complete in the third quarter of 2019, subject to approval by company shareholders, customary closing conditions, and regulatory approvals. Any failure to successfully develop or commercialize our product candidates pursuant to our current or any future collaboration agreements could have a material and adverse effect on our business, financial condition, results of operations and prospects.

To date, no product developed on a cell-free manufacturing platform has received approval from the FDA, so the requirements for the manufacturing of products using our XpressCF™ Platform are uncertain.

We have invested in our own current Good Manufacturing Practices, or cGMP, compliant manufacturing facility in San Carlos, California. In this facility, we are developing and implementing novel cell-free production technologies to supply our planned preclinical and clinical trials. However, before we may initiate a clinical trial or commercialize any of our product candidates, we must demonstrate to the FDA that the chemistry, manufacturing and controls for our product candidates meet applicable requirements, and in the European Union, or EU, a manufacturing authorization must be obtained from the appropriate EU regulatory authorities. The FDA has allowed Phase 1 clinical trial use of our product candidates STRO-001 and STRO-002, portions of which are manufactured in our San Carlos manufacturing facility; however, because no product manufactured on a cell-free manufacturing platform has yet been approved in the United States, there is no manufacturing facility that has demonstrated the ability to comply with FDA requirements for later stage clinical development or commercialization, and, therefore, the time frame for demonstrating compliance to the FDA's satisfaction is uncertain. Delays in establishing that our manufacturing process and facility comply with cGMPs or disruptions in our manufacturing processes, implementation of novel in-house technologies or scale-up activities, may delay or disrupt our development efforts.

We expect that development of our own manufacturing facility will provide us with enhanced control of material supply for preclinical studies, clinical trials and the commercial market, enable the more rapid implementation of process changes and allow for better long-term margins. However, we have limited experience as a company in establishing and operating a manufacturing facility and there exist only a small number of contract manufacturing organizations, or CMOs, with the experience necessary to manufacture our product candidates. We may have difficulty hiring experts for internal manufacturing or finding and maintaining relationships with external CMOs and, accordingly, our production capacity could be limited.

Our existing collaborations with Merck, Celgene and EMD Serono are important to our business. If our collaborators cease development efforts under our existing or future collaboration agreements, or if any of those agreements are terminated, these collaborations may fail to lead to commercial products and we may never receive milestone payments or future royalties under these agreements.

We have entered into collaborations with other biotechnology companies to develop several of our product candidates, and such collaborations currently represent a significant portion of our product pipeline and discovery and preclinical programs. Substantially all of our revenue to date has been derived from our existing collaboration agreements with Merck, Celgene and EMD Serono, and a significant portion of our future revenue and cash resources is expected to be derived from these agreements or other similar agreements into which we may enter in the future. Revenue from research and development collaborations depends upon continuation of the collaborations, payments for research and development services and product supply, and the achievement of milestones, contingent payments and royalties, if any, derived from future products developed from our research. If we are unable to successfully advance the development of our product candidates or achieve milestones, revenue and cash resources from milestone payments under our collaboration agreements will be substantially less than expected.

We are unable to predict the success of our collaborations and we may not realize the anticipated benefits of our strategic collaborations. Our collaborators have discretion in determining and directing the efforts and resources, including the ability to discontinue all efforts and resources, they apply to the development and, if approval is obtained, commercialization and marketing of the product candidates covered by such collaborations. As a result, our collaborators may elect to de-prioritize our programs, change their strategic focus or pursue alternative technologies in a manner that results in reduced, delayed or no revenue to us. Our collaborators may have other marketed products and product candidates under collaboration with other companies, including some of our competitors, and their corporate objectives may not be consistent with our best interests. Our collaborators may also be unsuccessful in developing or commercializing our products. If our collaborations are unsuccessful, our business, financial condition, results of operations and prospects could be adversely affected. In addition, any dispute or litigation proceedings we may have with our collaborators in the future could delay development programs, create uncertainty as to ownership of intellectual property rights, distract management from other business activities and generate substantial expense.

Moreover, to the extent that any of our existing or future collaborators were to terminate a collaboration agreement, we may be forced to independently develop these product candidates, including funding preclinical studies or clinical trials, assuming marketing and distribution costs and defending intellectual property rights, or, in certain instances, abandon product candidates altogether, any of which could result in a change to our business plan and have a material adverse effect on our business, financial condition, results of operations and prospects.

We may not successfully engage in strategic transactions, including any additional collaborations we seek, which could adversely affect our ability to develop and commercialize product candidates, impact our cash position, increase our expenses and present significant distractions to our management.

From time to time, we may consider strategic transactions, such as additional collaborations, acquisitions of companies, asset purchases and out- or in-licensing of product candidates or technologies that we believe will complement or augment our existing business. In particular, we will evaluate and, if strategically attractive, seek to enter into additional collaborations, including with major biotechnology or biopharmaceutical companies. The competition for collaborators is intense, and the negotiation process is time-consuming and complex. Any new collaboration may be on terms that are not optimal for us, and we may not be able to maintain any new collaboration if, for example, development or approval of a product candidate is delayed, sales of an approved product candidate do not meet expectations or the collaborator terminates the collaboration. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future strategic partners. Our ability to reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the strategic partner's resources and expertise, the terms and conditions of the proposed collaboration and the proposed strategic partner's evaluation of a number of factors. These factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. Moreover, if we acquire assets with promising markets or technologies, we may not be able to realize the benefit of acquiring such assets due to an inability to successfully integrate them with our existing technologies and may encounter numerous difficulties in developing, manufacturing and marketing any new products resulting from a strategic acquisition that delay or prevent us from realizing their expected benefits or enhancing our business.

We cannot assure you that following any such collaboration, or other strategic transaction, we will achieve the expected synergies to justify the transaction. For example, such transactions may require us to incur non-recurring or other charges, increase our near- and long-term expenditures and pose significant integration or implementation challenges or disrupt our management or business. These transactions would entail numerous operational and financial risks, including exposure to unknown liabilities, disruption of our business and diversion of our management's time and attention in order to manage a collaboration or develop acquired products, product candidates or technologies, incurrence of substantial debt or dilutive issuances of equity securities to pay transaction consideration or costs, higher than expected collaboration, acquisition or integration costs, write-downs of assets or goodwill or impairment charges, increased amortization expenses, difficulty and cost in facilitating the collaboration or combining the operations and personnel of any acquired business, impairment of relationships with key suppliers, manufacturers or customers of any acquired business due to changes in management and ownership and the inability to retain key employees of any acquired business. Also, such strategic alliance, joint venture or acquisition may be prohibited. For example, our Loan and Security Agreement, in the absence of the related lenders' prior written consent, restricts our ability to pursue certain mergers, acquisitions, amalgamations or consolidations that we may believe to be in our best interest.

Accordingly, although there can be no assurance that we will undertake or successfully complete any transactions of the nature described above, any transactions that we do complete may be subject to the foregoing or other risks and would have a material and adverse effect on our business, financial condition, results of operations and prospects. Conversely, any failure to enter any additional collaboration or other strategic transaction that would be beneficial to us could delay the development and potential commercialization of our product candidates and have a negative impact on the competitiveness of any product candidate that reaches market.

We expect to rely on third parties to conduct certain of our preclinical studies or clinical trials. If those third parties do not perform as contractually required, fail to satisfy regulatory or legal requirements or miss expected deadlines, our development program could be delayed with potentially material and adverse effects on our business, financial condition, results of operations and prospects.

We have relied in some cases and intend to rely in the future on third-party clinical investigators, clinical research organizations, or CROs, clinical data management organizations and consultants to assist or provide the design, conduct, supervision and monitoring of preclinical studies and clinical trials of our product candidates. Because we intend to rely on these third parties and will not have the ability to conduct all preclinical studies or clinical trials independently, we will have less control over the timing, quality and other aspects of preclinical studies and clinical trials than we would have had we conducted them on our own. These investigators, CROs and consultants will not be our employees and we will have limited control over the amount of time and resources that they dedicate to our programs. These third parties may have contractual relationships with other entities, some of which may be our competitors, which may draw time and resources from our programs. The third parties with which we may contract might not be diligent, careful or timely in conducting our preclinical studies or clinical trials, resulting in the preclinical studies or clinical trials being delayed or unsuccessful.

If we cannot contract with acceptable third parties on commercially reasonable terms, or at all, or if these third parties do not carry out their contractual duties, satisfy legal and regulatory requirements for the conduct of preclinical studies or clinical trials or meet expected deadlines, our clinical development programs could be delayed and otherwise adversely affected. In all events, we will be responsible for ensuring that each of our preclinical studies and clinical trials are conducted in accordance with the general investigational plan and protocols for the trial. The FDA requires preclinical studies to be conducted in accordance with good laboratory practices and clinical trials to be conducted in accordance with good clinical practices, including for designing, conducting, recording and reporting the results of preclinical studies and clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of clinical trial participants are protected. Our reliance on third parties that we do not control will not relieve us of these responsibilities and requirements. Any adverse development or delay in our preclinical studies or clinical trials as a result of our reliance on third parties could have a material and adverse effect on our business, financial condition, results of operations and prospects.

If we are unable to obtain sufficient raw and intermediate materials on a timely basis or if we experience other manufacturing or supply difficulties, our business may be adversely affected.

The manufacture of certain of our product candidates requires the timely delivery of sufficient amounts of raw and intermediate materials. We work closely with our suppliers to ensure the continuity of supply, but cannot guarantee these efforts will always be successful. Further, while efforts are made to diversify our sources of raw and intermediate materials, in certain instances we acquire raw and intermediate materials from a sole supplier. While we believe that alternative sources of supply exist where we rely on sole supplier relationships, there can be no assurance that we will be able to quickly establish additional or replacement sources for some materials. A reduction or interruption in supply, and an inability to develop alternative sources for such supply, could adversely affect our ability to manufacture our product candidates in a timely or cost-effective manner.

We currently manufacture a portion of our product candidates internally and also rely on third-party manufacturing and supply partners to supply components of our product candidates. Our inability to manufacture sufficient quantities of our product candidates, or the loss of our third-party suppliers, or our or their failure to comply with applicable regulatory requirements or to supply sufficient quantities at acceptable quality levels or prices, or at all, would materially and adversely affect our business.

Manufacturing is a vital component of our business strategy. To ensure timely and consistent product supply we currently use a hybrid product supply approach wherein certain elements of our product candidates are manufactured internally at our manufacturing facilities in San Carlos, California, and other elements are manufactured at qualified third-party CMOs. Since our own manufacturing facilities may be limited or unable to manufacture certain of our preclinical and clinical trial product materials and supplies, we rely on third-party contract manufacturers to manufacture such clinical trial product materials and supplies for our or our collaborator's needs. There can be no assurance that our preclinical and clinical development product supplies will not be limited, interrupted, or of satisfactory quality or continue to be available at acceptable prices. In particular, any replacement of our manufacturer could require significant effort and expertise because there may be a limited number of qualified replacements.

The manufacturing process for a product candidate is subject to FDA and foreign regulatory authority review. We, and our suppliers and manufacturers, must meet applicable manufacturing requirements and undergo rigorous facility and process validation tests required by regulatory authorities in order to comply with regulatory standards, such as cGMPs. If we or our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or comparable foreign regulatory authorities, we may not be able to rely on our or their manufacturing facilities for the manufacture of elements of our product candidates. Moreover, we do not control the manufacturing process at our contract manufacturers, and are completely dependent on them for compliance with current regulatory requirements. In the event that any of our manufacturers fails to comply with such requirements or to perform its obligations in relation to quality, timing or otherwise, or if our supply of components or other materials becomes limited or interrupted for other reasons, we may be forced to manufacture the materials ourselves or enter into an agreement with another third party, which we may not be able to do on reasonable terms, if at all. In some cases, the technical skills or technology required to manufacture our product candidates may be unique or proprietary to the original manufacturer and we may have difficulty applying such skills or technology ourselves, or in transferring such to another third party. These factors would increase our reliance on such manufacturer or require us to obtain a license from such manufacturer in order to enable us, or to have another third party, manufacture our product candidates. If we are required to change manufacturers for any reason, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines; and we may be required to repeat some of the development program. The delays associated with the verification of a new manufacturer could negatively affect our ability to develop product candidates in a timely manner or within budget.

We expect to continue to rely on third-party manufacturers if we receive regulatory approval for any product candidate. To the extent that we have existing, or enter into future, manufacturing arrangements with third parties, we will depend on these third parties to perform their obligations in a timely manner consistent with contractual and regulatory requirements, including those related to quality control and assurance. If we are unable to obtain or maintain third-party manufacturing for product candidates, or to do so on commercially reasonable terms, we may not be able to develop and commercialize our product candidates successfully. Our or a third party's failure to execute on our manufacturing requirements and comply with cGMPs could adversely affect our business in a number of ways, including:

- an inability to initiate or continue clinical trials of product candidates under development;
- delay in submitting regulatory applications, or receiving regulatory approvals, for product candidates;
- loss of the cooperation of an existing or future collaborator;

- subjecting third-party manufacturing facilities or our manufacturing facilities to additional inspections by regulatory authorities;
- requirements to cease distribution or to recall batches of our product candidates; and
- in the event of approval to market and commercialize a product candidate, an inability to meet commercial demands for our products.

Additionally, we and our contract manufacturers may experience manufacturing difficulties due to resource constraints or as a result of labor disputes or unstable political environments. If we or our contract manufacturers were to encounter any of these difficulties, our ability to provide our product candidates to patients in pre-clinical and clinical trials, or to provide product for treatment of patients once approved, would be jeopardized.

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

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

The manufacture of biologics is complex and we or our third-party manufacturers may encounter difficulties in production. If we or any of our third-party manufacturers encounter such difficulties, our ability to provide supply of our product candidates for clinical trials, our ability to obtain marketing approval, or our ability to provide supply of our products for patients, if approved, could be delayed or stopped.

Our product candidates are considered to be biologics and the process of manufacturing biologics is complex, time-consuming, highly regulated and subject to multiple risks. We and our contract manufacturers must comply with cGMPs, regulations and guidelines for the manufacturing of biologics used in clinical trials and, if approved, marketed products. To date, we and our contract manufacturers have limited experience in the manufacturing of cGMP batches of our product candidates.

Manufacturing biologics is highly susceptible to product loss due to contamination, equipment failure, improper installation or operation of equipment, vendor or operator error, inconsistency in yields, variability in product characteristics and difficulties in scaling the production process. Even minor deviations from normal manufacturing processes could result in reduced production yields, product defects and other supply disruptions. If microbial, viral or other contaminations are discovered at our manufacturing facilities or those of our third-party manufacturers, such facilities may need to be closed for an extended period of time to investigate and remedy the contamination, which could delay clinical trials and adversely harm our business. Moreover, if the FDA determines that our manufacturing facilities or those of our third-party manufacturers are not in compliance with FDA laws and regulations, including those governing cGMPs, the FDA may deny BLA approval until the deficiencies are corrected or we replace the manufacturer in our BLA with a manufacturer that is in compliance.

In addition, there are risks associated with large scale manufacturing for clinical trials or commercial scale including, among others, cost overruns, potential problems with process scale-up, process reproducibility, stability issues, compliance with cGMPs, lot consistency and timely availability of raw materials. Even if we or our collaborators obtain regulatory approval for any of our product candidates, there is no assurance that manufacturers will be able to manufacture the approved product to specifications acceptable to the FDA or other regulatory authorities, to produce it in sufficient quantities to meet the requirements for the potential launch of the product or to meet potential future demand. If our manufacturers are unable to produce sufficient quantities for clinical trials or for commercialization, commercialization efforts would be impaired, which would have an adverse effect on our business, financial condition, results of operations and prospects.

Scaling up a biologic manufacturing process is a difficult and uncertain task, and we may not be successful in transferring our production system or our third-party manufacturers may not have the necessary capabilities to complete the implementation and development process. If we are unable to adequately validate or scale-up the manufacturing process at our own manufacturing facilities or those of our current manufacturers, we will need to transfer to another manufacturer and complete the manufacturing validation process, which can be lengthy. If we are able to adequately validate and scale-up the manufacturing process for our product candidates at our manufacturing facility or with a contract manufacturer, we will still need to negotiate with such contract manufacturer an agreement for commercial supply and it is not certain we will be able to come to agreement on terms acceptable to us.

We cannot assure you that any stability or other issues relating to the manufacture of any of our product candidates or products will not occur in the future. If we or our third-party manufacturers were to encounter any of these difficulties, our ability to provide any product candidates to patients in planned clinical trials and products to patients, once approved, would be jeopardized. Any delay or interruption in the supply of clinical trial supplies could delay the completion of planned clinical trials, increase the costs associated with maintaining clinical trial programs and, depending upon the period of delay, require us to commence new clinical trials at additional expense or terminate clinical trials completely. Any adverse developments affecting clinical or commercial manufacturing of our product candidates or products may result in shipment delays, inventory shortages, lot failures, product withdrawals or recalls, or other interruptions in the supply of our product candidates or products. We may also have to take inventory write-offs and incur other charges and expenses for product candidates or products that fail to meet specifications, undertake costly remediation efforts or seek more costly manufacturing alternatives. Accordingly, failures or difficulties faced at any level of our supply chain could adversely affect our business and delay or impede the development and commercialization of any of our product candidates or products, if approved, and could have an adverse effect on our business, prospects, financial condition and results of operations.

As part of our process development efforts, we also may make changes to our manufacturing processes at various points during development, for various reasons, such as controlling costs, achieving scale, decreasing processing time, increasing manufacturing success rate or other reasons. Such changes carry the risk that they will not achieve their intended objectives, and any of these changes could cause our product candidates to perform differently and affect the results of our ongoing clinical trials or future clinical trials. In some circumstances, changes in the manufacturing process may require us to perform *ex vivo* comparability studies and to collect additional data from patients prior to undertaking more advanced clinical trials. For instance, changes in our process during the course of clinical development may require us to show the comparability of the product used in earlier clinical phases or at earlier portions of a trial to the product used in later clinical phases or later portions of the trial.

We may not be successful in our efforts to use our XpressCF™ Platform to expand our pipeline of product candidates and develop marketable products.

The success of our business depends in large part upon our ability to identify, develop and commercialize products based on our XpressCF™ Platform. STRO-001 and STRO-002 are our most advanced clinical stage programs and our preclinical and research programs may fail to identify other potential product candidates for clinical development for a number of reasons. Our research methodology may be unsuccessful in identifying potential product candidates or our potential product candidates may be shown to have harmful side effects or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval. If any of these events occur, we may be forced to abandon our development efforts for a program or for multiple programs, which would materially harm our business and could potentially cause us to cease operations. Research programs to identify new product candidates require substantial technical, financial and human resources. We may focus our efforts and resources on potential programs or product candidates that ultimately prove to be unsuccessful.

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

Because we have limited financial and managerial resources, we focus our research and development efforts on certain selected product candidates. As a result, we may forgo or delay pursuit of opportunities with other product candidates that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable product candidates. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Failure to successfully validate, develop and obtain regulatory approval for companion diagnostics for our product candidates could harm our drug development strategy and operational results.

If companion diagnostics are developed in conjunction with clinical programs, the FDA may require regulatory approval of a companion diagnostic as a condition to approval of the product candidate. For example, if we use a diagnostic test to determine which patients are most likely to benefit from STRO-001 for the treatment of multiple myeloma and non-Hodgkin lymphoma by designing our pivotal trial or trials of STRO-001 in that indication to require that clinical trial patients have elevated CD74 expression as a criterion for enrollment, then we will likely be required to obtain FDA approval or clearance of a companion diagnostic, concurrent with approval of STRO-001, to test for elevated CD74 expression; we may also be required to demonstrate to the FDA the predictive utility of the companion diagnostic—namely, that the diagnostic selects for patients in whom the biologic therapy will be effective or more effective compared to patients not selected for by the diagnostic. Similarly, as we are developing STRO-002 for a potential indication in patients with elevated FolRα expression levels, we may be required to obtain FDA approval or clearance of a companion diagnostic, concurrent with approval of STRO-002, to test for elevated FolRα expression. We do not have experience or capabilities in developing or commercializing diagnostics and plan to rely in large part on third parties to perform these functions. We do not currently have any agreement in place with any third party to develop or commercialize companion diagnostics for any of our product candidates. Companion diagnostics are subject to regulation by the FDA and foreign regulatory authorities as medical devices and require separate regulatory approval or clearance prior to commercialization.

If we or our collaborators, or any third party, are unable to successfully develop companion diagnostics for our product candidates, or experience delays in doing so:

- the development of our product candidates may be adversely affected if we are unable to appropriately select patients for enrollment in our planned clinical trials;
- our product candidates may not receive marketing approval if their safe and effective use depends on a companion diagnostic; and
- we may not realize the full commercial potential of any product candidates that receive marketing approval if, among other reasons, we are unable to appropriately identify patients with the specific genetic alterations targeted by our product candidates.

In addition, although we believe genetic testing is becoming more prevalent in the diagnosis and treatment of various diseases and conditions, our product candidates may be perceived negatively compared to alternative treatments that do not require the use of companion diagnostics, either due to the additional cost of the companion diagnostic or the need to complete additional procedures to identify genetic markers prior to administering our product candidates. If any of these events were to occur, our business would be harmed, possibly materially.

We face competition from entities that have developed or may develop product candidates for cancer, including companies developing novel treatments and technology platforms. If these companies develop technologies or product candidates more rapidly than we do or their technologies are more effective, our ability to develop and successfully commercialize product candidates may be adversely affected.

The development and commercialization of drugs and therapeutic biologics is highly competitive. Our product 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. We compete with a variety of multinational biopharmaceutical companies, specialized biotechnology companies and emerging biotechnology companies, as well as with technologies and product candidates being developed at universities and other research institutions. Our competitors have developed, are developing or will develop product candidates and processes competitive with our product candidates and processes. Competitive therapeutic treatments include those that have already been approved and accepted by the medical community and any new treatments, including those based on novel technology platforms, that enter the market. We believe that a significant number of products are currently under development, and may become commercially available in the future, for the treatment of conditions for which we are trying, or may try, to develop product candidates. There is intense and rapidly evolving competition in the biotechnology, biopharmaceutical and antibody and immunoregulatory therapeutics fields. While we believe that our XpressCF™ Platform, associated intellectual property and our scientific and technical know-how give us a competitive advantage in this space, competition from many sources exists or may arise in the future. Our competitors include larger and better funded biopharmaceutical, biotechnological and therapeutics companies, including companies focused on cancer immunotherapies, such as AstraZeneca PLC, Bristol-Myers Squibb

Company, or BMS, GlaxoSmithKline PLC, Merck & Co., Inc., or Merck, Novartis AG, Pfizer Inc., or Pfizer, Roche Holding Ltd, Sanofi S.A and companies focused on ADCs, such as Pfizer, ImmunoGen, Inc., or Immunogen, Seattle Genetics, Inc., or Seattle Genetics, and Genentech, Inc., or Genentech, as well as numerous small companies. Moreover, we also compete with current and future therapeutics developed at universities and other research institutions.

We are aware of several companies that are developing ADCs, cytokine derivatives, bispecific antibodies and cancer immunotherapies. Many of these companies are well-capitalized and, in contrast to us, have significant clinical experience, and may include our existing or future collaborators. In addition, these companies compete with us in recruiting scientific and managerial talent.

Our success will depend partially on our ability to develop and protect therapeutics that are safer and more effective than competing products. Our commercial opportunity and success will be reduced or eliminated if competing products are safer, more effective, or less expensive than the therapeutics we develop.

If our lead product candidates are approved, they will compete with a range of therapeutic treatments that are either in development or currently marketed. Currently marketed oncology drugs and therapeutics range from ADCs, such as Genentech's Kadcyla, to immune checkpoint inhibitors such as BMS's Opdivo to T cell-engager immunotherapies such as Amgen, Inc.'s Blincyto. In addition, numerous compounds are in clinical development for cancer treatment. With respect to B cell-based malignancies, such as multiple myeloma, the most common treatments are chemotherapeutic compounds, radiation therapy, stem cell transplantation and immunomodulating agents. The clinical development pipeline for cancer includes small molecules, antibodies, vaccines, cell therapies and immunotherapies from a variety of companies and institutions.

Many of our competitors have significantly greater financial, technical, manufacturing, marketing, sales and supply resources or experience than we have. If we successfully obtain approval for any product candidate, we will face competition based on many different factors, including the safety and effectiveness of our products, the ease with which our products can be administered and the extent to which patients accept relatively new routes of administration, the timing and scope of regulatory approvals for these products, the availability and cost of manufacturing, marketing and sales capabilities, price, reimbursement coverage and patent position. Competing products could present superior treatment alternatives, including by being more effective, safer, less expensive or marketed and sold more effectively than any products we may develop. Competitive products may make any products we develop obsolete or noncompetitive before we recover the expense of developing and commercializing our product candidates. Such competitors could also recruit our employees, which could negatively impact our level of expertise and our ability to execute our business plan.

Any inability to attract and retain qualified key management and technical personnel would impair our ability to implement our business plan.

Our success largely depends on the continued service of key management, advisors and other specialized personnel, including William J. Newell, our chief executive officer, Edward Albini, our chief financial officer, Trevor J. Hallam, Ph.D., our chief scientific officer, Arturo Molina, M.D., our chief medical officer and Shabbir T. Anik, Ph.D., our chief technical operations officer. The loss of one or more members of our management team or other key employees or advisors could delay our research and development programs and have a material and adverse effect on our business, financial condition, results of operations and prospects. The relationships that our key managers have cultivated within our industry make us particularly dependent upon their continued employment with us. We are dependent on the continued service of our technical personnel because of the highly technical nature of our product candidates and XpressCF™ Platform technologies and the specialized nature of the regulatory approval process. Because our management team and key employees are not obligated to provide us with continued service, they could terminate their employment with us at any time without penalty. Our future success will depend in large part on our continued ability to attract and retain other highly qualified scientific, technical and management personnel, as well as personnel with expertise in clinical testing, manufacturing, governmental regulation and commercialization. We face competition for personnel from other companies, universities, public and private research institutions, government entities and other organizations. If we are unable to continue to attract and retain high-quality personnel, the rate and success at which we can discover and develop product candidates will be limited which could have a material and adverse effect on our business, financial condition, results of operations and prospects.

We will need to grow our organization, and we may experience difficulties in managing our growth and expanding our operations.

As of December 31, 2018, we had 147 full-time employees. As our development and commercialization plans and strategies develop, and as we transition into operating as a public company, we expect to expand our employee base for managerial, operational, financial and other resources. In addition, we have limited experience in product development and have just begun our first clinical trials for our first two product candidates. As our product candidates enter and advance through preclinical studies and clinical trials, we will need to expand our development, regulatory and manufacturing capabilities or contract with other organizations to provide these capabilities for us. In the future, we expect to have to manage additional relationships with collaborators or partners, suppliers and other organizations. Our ability to manage our operations and future growth will require us to continue to improve our operational, financial and management controls, reporting systems and procedures. We may not be able to implement improvements to our management information and control systems in an efficient or timely manner and may discover deficiencies in existing systems and controls. Our inability to successfully manage our growth and expand our operations could have a material and adverse effect on our business, financial condition, results of operations and prospects.

If any of our product candidates are approved for marketing and commercialization and we are unable to develop sales, marketing and distribution capabilities on our own or enter into agreements with third parties to perform these functions on acceptable terms, we will be unable to commercialize successfully any such future products.

We currently have no sales, marketing or distribution capabilities or experience. If any of our product candidates are approved, we will need to develop internal sales, marketing and distribution capabilities to commercialize such products, which would be expensive and time consuming, or enter into collaborations with third parties to perform these services. If we decide to market our products directly, we will need to commit significant financial and managerial resources to develop a marketing and sales force with technical expertise and supporting distribution, administration and compliance capabilities. If we rely on third parties with such capabilities to market our products or decide to co-promote products with collaborators, we will need to establish and maintain marketing and distribution arrangements with third parties, and there can be no assurance that we will be able to enter into such arrangements on acceptable terms or at all. In entering into third-party marketing or distribution arrangements, any revenue we receive will depend upon the efforts of the third parties and there can be no assurance that such third parties will establish adequate sales and distribution capabilities or be successful in gaining market acceptance of any approved product. If we are not successful in commercializing any product approved in the future, either on our own or through third parties, our business, financial condition, results of operations and prospects could be materially and adversely affected.

Our future growth may depend, in part, on our ability to operate in foreign markets, where we would be subject to additional regulatory burdens and other risks and uncertainties.

Our future growth may depend, in part, on our ability to develop and commercialize our product candidates in foreign markets for which we may rely on collaboration with third parties. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from the applicable regulatory authority in that foreign market, and may never receive such regulatory approval for any of our product candidates. To obtain separate regulatory approval in many other countries, we must comply with numerous and varying regulatory requirements of such countries regarding safety and efficacy and governing, among other things, clinical trials and commercial sales, pricing and distribution of our product candidates, and we cannot predict success in these jurisdictions. If we fail to comply with the regulatory requirements in international markets and do not receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of our product candidates will be harmed and our business will be adversely affected. We may not obtain foreign regulatory approvals on a timely basis, if at all. Our failure to obtain approval of any of our product candidates by regulatory authorities in another country may significantly diminish the commercial prospects of that product candidate and our business, financial condition, results of operations and prospects could be materially and adversely affected. Moreover, even if we obtain approval of our product candidates and ultimately commercialize our product candidates in foreign markets, we would be subject to the risks and uncertainties, including the burden of complying with complex and changing foreign regulatory, tax, accounting and legal requirements and reduced protection of intellectual property rights in some foreign countries.

Price controls imposed in foreign markets may adversely affect our future profitability.

In some countries, particularly member states of the EU, the pricing of prescription drugs is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take considerable time after receipt of marketing approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various EU member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. In some countries, we or current or future collaborators may be required to conduct a clinical trial or other studies that compare the cost-effectiveness of our therapeutic candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If reimbursement of any product candidate approved for marketing is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our business, financial condition, results of operations or prospects could be materially and adversely affected.

Price Controls imposed in the U.S. may affect our future profitability.

Recently there has 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 and enacted federal and state legislation 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. Current and future presidential budget proposals and future legislation may contain further drug price control measures that could be enacted. Congress and current and future U.S. presidential administrations may continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures are increasingly 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. If such pricing controls are enacted and are set at unsatisfactory levels, our business, financial condition, results of operations or prospects could be materially and adversely affected.

Our business entails a significant risk of product liability and our ability to obtain sufficient insurance coverage could have a material and adverse effect on our business, financial condition, results of operations and prospects.

As we are conducting clinical trials of our product candidates we may be exposed to significant product liability risks inherent in the development, testing, manufacturing and marketing of therapeutic treatments. Product liability claims could delay or prevent completion of our development programs. If we succeed in marketing products, such claims could result in an FDA investigation of the safety and effectiveness of our products, our manufacturing processes and facilities or our marketing programs and potentially a recall of our products or more serious enforcement action, limitations on the approved indications for which they may be used or suspension or withdrawal of approvals. Regardless of the merits or eventual outcome, liability claims may also result in decreased demand for our products, injury to our reputation, costs to defend the related litigation, a diversion of management's time and our resources, substantial monetary awards to trial participants or patients and a decline in our stock price. While we currently have product liability insurance that we believe is appropriate for our stage of development, we may need to obtain higher levels prior to later stages of clinical development or marketing any of our product candidates. Any insurance we have or may obtain may not provide sufficient coverage against potential liabilities. Furthermore, clinical trial and product liability insurance is becoming increasingly expensive. As a result, we may be unable to obtain sufficient insurance at a reasonable cost to protect us against losses caused by product liability claims that could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

As with all companies, we are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with FDA regulations, provide accurate information to the FDA, comply with manufacturing standards we may establish, comply with federal and state healthcare fraud and abuse laws and regulations, inappropriately share confidential and proprietary information externally, report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, 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. 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 material and adverse effect on our business, financial condition, results of operations and prospects, including the imposition of significant civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, the curtailment or restructuring of our operations, loss of eligibility to obtain approvals from the FDA, exclusion from participation in government contracting, healthcare reimbursement or other government programs, including Medicare and Medicaid, integrity oversight and reporting obligations, or reputational harm.

We depend on our information technology systems, and any failure of these systems, or those of our CROs or other contractors or consultants we may utilize, could harm our business. Security breaches, loss of data, and other disruptions could compromise sensitive information related to our business or prevent us from accessing critical information and expose us to liability, which could adversely affect our business, results of operations, financial condition and prospects.

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, cyber-attacks 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 or data loss, 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 trial data from completed or ongoing or planned clinical trials 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, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, 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, financial condition and prospects.

Our information technology systems could face serious disruptions that could adversely affect our business.

Our information technology and other internal infrastructure systems, including corporate firewalls, servers, leased lines and connection to the Internet, face the risk of systemic failure that could disrupt our operations. A significant disruption in the availability of our information technology and other internal infrastructure systems could cause interruptions and delays in our research and development and manufacturing work.

The terms of our Loan and Security Agreement require us to meet certain covenants and place restrictions on our operating and financial flexibility. If we raise additional capital through debt financing, the terms of any new debt could further restrict our ability to operate our business.

The Loan and Security Agreement is secured by a lien covering all of our assets, excluding our intellectual property and certain other assets. Subject to the terms of the Loan and Security Agreement, we have the option to prepay all, but not less than all, of the amounts borrowed under the Loan and Security Agreement, subject to certain penalty payments, prior to the August 1, 2021 maturity date, at which time all amounts borrowed will be due and payable.

The Loan and Security Agreement contains customary affirmative and negative covenants, indemnification provisions and events of default. The affirmative covenants include, among others, covenants requiring us to maintain our legal existence and governmental approvals, deliver certain financial reports and maintain certain intellectual property rights. The negative covenants include, among others, restrictions on transferring or licensing our assets, changing our business, incurring additional indebtedness, engaging in mergers or acquisitions, paying dividends or making other distributions, and creating other liens on our assets, in each case subject to customary exceptions. If we default under the Loan and Security Agreement, the lenders will be able to declare all obligations immediately due and payable and take control of our collateral, potentially requiring us to renegotiate our agreement on terms less favorable to us or to immediately cease operations. Further, if we are liquidated, the rights of Oxford and SVB to repayment would be senior to the rights of the holders of our common stock to receive any proceeds from the liquidation. Oxford, acting as collateral agent for the lenders, could declare a default under the Loan and Security Agreement upon the occurrence of any event that Oxford and SVB interpret as a material adverse change as defined under the Loan and Security Agreement, thereby requiring us to repay the loan immediately or to attempt to reverse the declaration of default through negotiation or litigation. Any declaration by the collateral agent of an event of default could significantly harm our business and prospects and could cause the price of our common stock to decline. If we raise any additional debt financing, the terms of such additional debt could further restrict our operating and financial flexibility.

If we do not comply with laws regulating the protection of the environment and health and human safety, our business could be affected adversely.

Our research, development and manufacturing involve the use of hazardous chemicals and materials, including radioactive materials. We maintain quantities of various flammable and toxic chemicals in our facilities in South San Francisco and San Carlos, California that are required for our research, development and manufacturing activities. We are subject to federal, state and local laws and regulations governing the use, manufacture, storage, handling and disposal of these hazardous chemicals and materials. We believe our procedures for storing, handling and disposing these materials in our South San Francisco and San Carlos facilities comply with the relevant guidelines of the two municipalities, the counties of San Francisco and San Mateo, the state of California and the Occupational Safety and Health Administration of the U.S. Department of Labor. Although we believe that our safety procedures for handling and disposing of these materials comply with the standards mandated by applicable regulations, the risk of accidental contamination or injury from these materials cannot be eliminated. If an accident occurs, we could be held liable for resulting damages, which could be substantial. We are also subject to numerous environmental, health and workplace safety laws and regulations, including those governing laboratory procedures, exposure to blood-borne pathogens and the handling of animals and biohazardous materials. 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 these materials, this insurance may not provide adequate coverage against potential liabilities.

While we maintain pollution legal liability insurance for our manufacturing facility in San Carlos, California, we do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological or hazardous materials in our other locations. Additional federal, state and local laws and regulations affecting our operations may be adopted in the future. We may incur substantial costs to comply with, and substantial fines or penalties if we violate, any of these laws or regulations.

Our current operations are in two cities in the San Francisco Bay Area, and we, or the third parties upon whom we depend, may be adversely affected by earthquakes or other natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Our current operations are located in our facilities in South San Francisco and San Carlos, California. Any unplanned event, such as earthquake, flood, fire, explosion, extreme weather condition, medical epidemic, power shortage, telecommunication failure or other natural or man-made accidents or incidents that result in us being unable to fully utilize our facilities, or the manufacturing facilities of our third-party contract manufacturers, may have a material and adverse effect on our ability to operate our business, particularly on a daily basis, and have significant negative consequences on our financial and operating conditions. Loss of access to these facilities may result in increased costs, delays in the development of our product candidates or interruption of our business operations. Earthquakes or other natural disasters could further disrupt our operations, and have a material and adverse effect on our business, financial condition, results of operations 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 research or manufacturing facilities or the manufacturing facilities of our third-party contract manufacturers, 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 may prove inadequate 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 could have a material adverse effect on our business. As part of our risk management policy, we maintain insurance coverage at levels that we believe are appropriate for our business. However, in the event of an accident or incident at these facilities, we cannot assure you that the amounts of insurance will be sufficient to satisfy any damages and losses. If our facilities, or the manufacturing facilities of our third-party contract manufacturers, are unable to operate because of an accident or incident or for any other reason, even for a short period of time, any or all of our research and development programs may be harmed. Any business interruption could have a material and adverse effect on our business, financial condition, results of operations and prospects.

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

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, if a corporation undergoes an "ownership change" (generally defined as a greater than 50 percentage points change (by value) in the ownership of its equity over a rolling three-year period), the corporation's ability to use its pre-change net operating loss, or NOL, carryforwards and certain other pre-change tax attributes to offset its post-change income and taxes may be limited. We have experienced such ownership changes in the past and may experience such ownership changes in the future, some of which are outside our control.

As of December 31, 2018, we had federal NOL carryforwards of approximately $114.0 million, and our ability to utilize those NOL carryforwards could be limited by an "ownership change" as described above, which could result in increased tax liability to our company.

On December 22, 2017, the current U.S. presidential administration, signed into law the Tax Cuts and Jobs Act of 2017, or the Tax Reform Act. The legislation significantly changes U.S. tax law by, among other things, lowering the corporate income tax rates. The Tax Reform Act permanently reduces the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. Additionally, the Tax Reform Act will no longer allow deductions for compensation in excess of $1.0 million for certain employees, even if paid as commissions or performance-based compensation. We may be subject to these limitations as provided for under Section 162(m) of the Code in the future. The Tax Reform Act also limits the amount taxpayers are able to deduct for federal NOL carryforwards generated in taxable years beginning after December 31, 2017 to 80% of the taxpayer's taxable income. The law also generally repeals all carrybacks. However, any NOLs generated in taxable years after December 31, 2017 can be carried forward indefinitely. Losses arising in taxable years beginning before December 31, 2017 may still be carried back two years and are subject to their current expiration period. As of December 31, 2018, we had approximately $88.7 million of federal NOLs that were generated prior to 2018, which will expire at various dates beginning in 2032, if not used to reduce income taxes payable in the future. Federal NOLs generated by us subsequent to 2017 may only offset 80% of taxable income.

Our financial results may be adversely affected by changes in accounting principles generally accepted in the United States.

Generally accepted accounting principles in the United States (U.S. GAAP) is subject to interpretation by the Financial Accounting Standards Board (FASB), the American Institute of Certified Public Accountants, the SEC and various bodies formed to promulgate and interpret appropriate accounting principles. For example, in May 2014, the FASB issued accounting standards update No. 2014-09 (Topic 606), Revenue from Contracts with Customers, which supersedes nearly all existing revenue recognition guidance under U.S. GAAP. We will be required to implement this guidance in the first quarter of our fiscal year 2019. Any difficulties in implementing this guidance could cause us to fail to meet our financial reporting obligations, which could result in regulatory discipline and harm investors' confidence in us. Additionally, the implementation of this guidance or a change in other principles or interpretations could have a significant effect on our financial results, and could affect the reporting of transactions completed before the announcement of a change. Furthermore, we will be adopting Topic 606 through the modified retrospective method. This will impact the comparability of our financial results which might lead investors to draw incorrect conclusions which could harm investor interest in holding or purchasing our equity.

Risks Related to Intellectual Property

If we are not able to obtain and enforce patent protection for our technologies or product candidates, development and commercialization of our product candidates may be adversely affected.

Our success depends in part on our ability to obtain and maintain patents and other forms of intellectual property rights, including in-licenses of intellectual property rights of others, for our product candidates, methods used to manufacture our product candidates and methods for treating patients using our product candidates, as well as our ability to preserve our trade secrets, to prevent third parties from infringing upon our proprietary rights and to operate without infringing upon the proprietary rights of others. We may not be able to apply for patents on certain aspects of our product candidates in a timely fashion or at all. Further, we may not be able to prosecute all necessary or desirable patent applications, or maintain, enforce and license any patents that may issue from such patent applications, at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. We may not have the right to control the preparation, filing and prosecution of all patent applications that we license from third parties, or to maintain the rights to patents licensed to third parties. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. Our existing issued and granted patents and any future patents we obtain may not be sufficiently broad to prevent others from using our technology or from developing competing products and technology. There is no guarantee that any of our pending patent applications will result in issued or granted patents, that any of our issued or granted patents will not later be found to be invalid or unenforceable or that any issued or granted patents will include claims that are sufficiently broad to cover our product candidates or to provide meaningful protection from our competitors. Moreover, the patent position of biotechnology and biopharmaceutical companies can be highly uncertain because it involves complex legal and factual questions. We will be able to protect our proprietary rights from unauthorized use by third parties only to the extent that our current and future proprietary technology and product candidates are covered by valid and enforceable patents or are effectively maintained as trade secrets. If third parties disclose or misappropriate our proprietary rights, it may materially and adversely affect our position in the market.

The U.S. Patent and Trademark Office, or USPTO, and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case. The standards applied by the USPTO and foreign patent offices in granting patents are not always applied uniformly or predictably. For example, there is no uniform worldwide policy regarding patentable subject matter or the scope of claims allowable in biotechnology and biopharmaceutical patents. As such, we do not know the degree of future protection that we will have on our proprietary products and technology. While we will endeavor to try to protect our product candidates with intellectual property rights such as patents, as appropriate, the process of obtaining patents is time consuming, expensive and sometimes unpredictable.

Once granted, patents may remain open to opposition, interference, re-examination, post-grant review, *inter partes* review, nullification or derivation action in court or before patent offices or similar proceedings for a given period after allowance or grant, during which time third parties can raise objections against such initial grant. In the course of such proceedings, which may continue for a protracted period of time, the patent owner may be compelled to limit the scope of the allowed or granted claims thus attacked, or may lose the allowed or granted claims altogether. In addition, there can be no assurance that:

- others will not or may not be able to make, use or sell compounds that are the same as or similar to our product candidates but that are not covered by the claims of the patents that we own or license;
- we or our licensors, or our existing or future collaborators are the first to make the inventions covered by each of our issued patents and pending patent applications that we own or license;
- we or our licensors, or our existing or future collaborators are the first to file patent applications covering certain aspects of our inventions;
- others will not independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- a third party may not challenge our patents and, if challenged, a court would hold that our patents are valid, enforceable and infringed;
- any issued patents that we own or have licensed will provide us with any competitive advantages, or will not be challenged by third parties;
- we may develop additional proprietary technologies that are patentable;
- the patents of others will not have a material or adverse effect on our business, financial condition, results of operations and prospects; and
- our competitors do not conduct research and development activities in countries where we do not have enforceable patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets.

If we or our licensors or collaborators fail to maintain the patents and patent applications covering our product candidates, our competitors might be able to enter the market, which could have a material and adverse effect on our business, financial condition, results of operations and prospects.

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

In addition to seeking patent protection for certain aspects of our product candidates, we also consider trade secrets, including confidential and unpatented know-how important to the maintenance of our competitive position. We protect trade secrets and confidential and unpatented know-how, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to such knowledge, such as our employees, corporate collaborators, outside scientific collaborators, CROs, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants that obligate them to maintain confidentiality and assign their inventions to us. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time- consuming, and the outcome is unpredictable. In addition, some courts in the United States and certain foreign jurisdictions are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed which could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Other companies or organizations may challenge our or our licensors' patent rights or may assert patent rights that prevent us from developing and commercializing our products.

Therapeutics in oncology or other disease areas developed in cell-free-based synthesis systems are a relatively new scientific field. We have obtained grants and issuances of, and have obtained a license from a third party on an exclusive basis to, patents related to our proprietary XpressCF™ Platform. The issued patents and pending patent applications in the United States and in key markets around the world that we own or license claim many different methods, compositions and processes relating to the discovery, development, manufacture and commercialization of antibody-based and other therapeutics.

As the field of antibody-based therapeutics continues to mature, patent applications are being processed by national patent offices around the world. There is uncertainty about which patents will issue and, if they do, as to when, to whom, and with what claims. In addition, third parties may attempt to invalidate our intellectual property rights. Even if our rights are not directly challenged, disputes could lead to the weakening of our intellectual property rights. Our defense against any attempt by third parties to circumvent or invalidate our intellectual property rights could be costly to us, could require significant time and attention of our management and could have a material and adverse effect on our business, financial condition, results of operations and prospects or our ability to successfully compete.

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

Obtaining a valid and enforceable issued or granted patent covering our technology in the United States and worldwide can be extremely costly, and our or our licensors' or collaborators' intellectual property rights may not exist in some countries outside the United States or may be less extensive in some countries than in the United States. In jurisdictions where we or our licensors or collaborators have not obtained patent protection, competitors may seek to use our or their technology to develop their own products and further, may export otherwise infringing products to territories where we or they have patent protection, but where it is more difficult to enforce a patent as compared to the United States. Competitor products may compete with our future products in jurisdictions where we do not have issued or granted patents or where our or our licensors' or collaborators' issued or granted patent claims or other intellectual property rights are not sufficient to prevent competitor activities in these jurisdictions. The legal systems of certain countries, particularly certain developing countries, make it difficult to enforce patents and such countries may not recognize other types of intellectual property protection, particularly relating to biopharmaceuticals. This could make it difficult for us or our licensors or collaborators to prevent the infringement of our or their patents or marketing of competing products in violation of our or their proprietary rights generally in certain jurisdictions. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our and our licensors' or collaborators' efforts and attention from other aspects of our business, could put our and our licensors' or collaborators' patents at risk of being invalidated or interpreted narrowly and our and our licensors' or collaborators' patent applications at risk of not issuing and could provoke third parties to assert claims against us or our licensors or collaborators. We or our licensors or collaborators may not prevail in any lawsuits that we or our licensors or collaborators initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful.

We generally file a provisional patent application first (a priority filing) at the USPTO. An international application under the Patent Cooperation Treaty, PCT, is usually filed within twelve months after the priority filing. Based on the PCT filing, national and regional patent applications may be filed in the United States, EU, Japan, Australia and Canada and, depending on the individual case, also in any or all of, inter alia, Brazil, China, Hong Kong, India, Israel, Mexico, New Zealand, Russia, South Africa, South Korea and other jurisdictions. We have so far not filed for patent protection in all national and regional jurisdictions where such protection may be available. In addition, we may decide to abandon national and regional patent applications before grant. Finally, the grant proceeding of each national or regional patent is an independent proceeding which may lead to situations in which applications might in some jurisdictions be refused by the relevant registration authorities, while granted by others. It is also quite common that depending on the country, various scopes of patent protection may be granted on the same product candidate or technology.

The laws of some jurisdictions do not protect intellectual property rights to the same extent as the laws in the United States, and many companies have encountered significant difficulties in protecting and defending such rights in such jurisdictions. If we or our licensors or collaborators encounter difficulties in protecting, or are otherwise precluded from effectively protecting, the intellectual property rights important for our business in such jurisdictions, the value of these rights may be diminished and we may face additional competition from others in those jurisdictions. Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we or any of our licensors or collaborators are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position in the relevant jurisdiction may be impaired and our business, financial condition, results of operations and prospects may be adversely affected.

We, our licensors or collaborators, or any future strategic partners may need to resort to litigation to protect or enforce our patents or other proprietary rights, all of which could be costly, time consuming, delay or prevent the development and commercialization of our product candidates, or put our patents and other proprietary rights at risk.

Competitors may infringe our patents or other intellectual property. If we were to initiate legal proceedings against a third party to enforce a patent covering one of our products or our technology, the defendant could counterclaim that our patent is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, for example, lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that an individual connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. The outcome following legal assertions of invalidity and unenforceability during patent litigation 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 or unenforceability, we would lose at least part, and perhaps all, of the patent protection on one or more of our products or certain aspects of our platform technology. Such a loss of patent protection could have a material and adverse effect on our business, financial condition, results of operations and prospects. Interference or derivation proceedings provoked by third parties or brought by us or declared by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms or at all, or if a non-exclusive license is offered and our competitors gain access to the same technology. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions, or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock. Patents and other intellectual property rights also will not protect our technology if competitors design around our protected technology without legally infringing our patents or other intellectual property rights.

Intellectual property rights of third parties could adversely affect our ability to commercialize our product candidates, and we, our licensors or collaborators, or any future strategic partners may become subject to third party claims or litigation alleging infringement of patents or other proprietary rights or seeking to invalidate patents or other proprietary rights. We might be required to litigate or obtain licenses from third parties in order to develop or market our product candidates. Such litigation or licenses could be costly or not available on commercially reasonable terms.

We, our licensors or collaborators, or any future strategic partners may be subject to third-party claims for infringement or misappropriation of patent or other proprietary rights. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions and *inter partes* review proceedings before the USPTO, and corresponding foreign patent offices. There are many issued and pending patents that might claim aspects of our product candidates and modifications that we may need to apply to our product candidates. There are also many issued patents that claim antibodies, portions of antibodies, cytokines, half-life extending polymers, linkers, cytotoxins, or other warheads that may be relevant for the products we wish to develop. Thus, it is possible that one or more organizations will hold patent rights to which we will need a license. If those organizations refuse to grant us a license to such patent rights on reasonable terms, we may not be able to market products or perform research and development or other activities covered by these patents which could have a material and adverse effect on our business, financial condition, results of operations and prospects. We are obligated under certain of our license and collaboration agreements to indemnify and hold harmless our licensors or collaborators for damages arising from intellectual property infringement by use. For example, we are obligated under the Stanford Agreement to indemnify and hold harmless Stanford for damages arising from intellectual property infringement by us resulting from exercise of the license from Stanford. If we, our licensors or collaborators, or any future strategic partners are found to infringe a third-party patent or other intellectual property rights, we could be required to pay damages, potentially including treble damages, if we are found to have infringed willfully. In addition, we, our licensors or collaborators, or any future strategic partners may choose to seek, or be required to seek, a license from a third party, which may not be available on acceptable terms, if at all. Even if a license can be obtained on acceptable terms, the rights may be non-exclusive, which could give our competitors access to the

same technology or intellectual property rights licensed to us. If we fail to obtain a required license, we or our existing or future collaborators may be unable to effectively market product candidates based on our technology, which could limit our ability to generate revenue or achieve profitability and possibly prevent us from generating revenue sufficient to sustain our operations. In addition, we may find it necessary to pursue claims or initiate lawsuits to protect or enforce our patent or other intellectual property rights. The cost to us in defending or initiating any litigation or other proceeding relating to patent or other proprietary rights, even if resolved in our favor, could be substantial, and litigation could divert our management's attention. 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. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could delay our research and development efforts and limit our ability to continue our operations.

Because the antibody-based therapeutics landscape is still evolving, it is difficult to conclusively assess our freedom to operate without infringing on third-party rights. There are numerous companies that have pending patent applications and issued patents broadly covering antibodies generally, covering antibodies directed against the same targets as, or targets similar to, those we are pursuing, or covering linkers and cytotoxic warheads similar to those that we are using in our product candidates. For example, we are aware of an issued patent, expected to expire in 2023, which has claims relating to methods of treating CD74-positive multiple myeloma with an ADC targeting CD74. If valid and not yet expired when, and if, we receive marketing approval for STRO-001, we may need to seek a license to this patent, which may not be available on commercially reasonable terms or at all. Failure to receive a license could delay commercialization of STRO-001. Our competitive position may suffer if patents issued to third parties or other third-party intellectual property rights cover our products or product candidates or elements thereof, or our manufacture or uses relevant to our development plans. In such cases, we may not be in a position to develop or commercialize products or product candidates until such patents expire or unless we successfully pursue litigation to nullify or invalidate the third-party intellectual property right concerned, or enter into a license agreement with the intellectual property right holder, if available on commercially reasonable terms. There may be issued patents of which we are not aware, held by third parties that, if found to be valid and enforceable, could be alleged to be infringed by our XpressCF™ Platform and related technologies and product candidates. There also may be pending patent applications of which we are not aware that may result in issued patents, which could be alleged to be infringed by our XpressCF™ Platform and related technologies and product candidates. If such an infringement claim should be brought and be successful, we may be required to pay substantial damages, including potentially treble damages and attorneys' fees for willful infringement, and we may be forced to abandon our product candidates or seek a license from any patent holders. No assurances can be given that a license will be available on commercially reasonable terms, if at all.

It is also possible that we have failed to identify relevant third-party patents or applications. For example, U.S. applications filed before November 29, 2000 and certain U.S. applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Patent applications in the United States and elsewhere are published approximately 18 months after the earliest filing for which priority is claimed, with such earliest filing date being commonly referred to as the priority date. Therefore, patent applications covering our products or platform technology could have been filed by others without our knowledge. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover our platform technology, our products or the use of our products. Third-party intellectual property right holders may also actively bring infringement claims against us. We cannot guarantee that we will be able to successfully settle or otherwise resolve such infringement claims. If we are unable to successfully settle future claims on terms acceptable to us, we may be required to engage in or continue costly, unpredictable and time-consuming litigation and may be prevented from or experience substantial delays in marketing our products. Parties making claims against us may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or administrative proceedings, there is a risk that some of our confidential information could be compromised by disclosure. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have material adverse effect on our ability to raise additional funds or otherwise have a material adverse effect on our business, results of operations, financial condition and prospects. If we fail in any such dispute, in addition to being forced to pay damages, we may be temporarily or permanently prohibited from commercializing any of our product candidates that are held to be infringing. We might, if possible, also be forced to redesign product candidates so that we no longer infringe the third-party intellectual property rights. Any of these events, even if we were ultimately to prevail, could require us to divert substantial financial and management resources that we would otherwise be able to devote to our business and could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Litigation or other legal proceedings relating to intellectual property claims, with or without merit, is unpredictable and generally expensive and time consuming and is likely to divert significant resources from our core business, including distracting our technical and management personnel from their normal responsibilities. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. 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 substantial adverse effect on the price of our common stock. Moreover, such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities.

We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating or from successfully challenging our intellectual property rights. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

If we fail to comply with our obligations under any license, collaboration or other agreements, we may be required to pay damages and could lose intellectual property rights that are necessary for developing and protecting our product candidates or we could lose certain rights to grant sublicenses.

Our current licenses impose, and any future licenses we enter into are likely to impose, various development, commercialization, funding, milestone, royalty, diligence, sublicensing, insurance, patent prosecution and enforcement and/or other obligations on us. If we breach any of these obligations, or use the intellectual property licensed to us in an unauthorized manner, we may be required to pay damages and the licensor may have the right to terminate the license, which could result in us being unable to develop, manufacture and sell any future products that are covered by the licensed technology or enable a competitor to gain access to the licensed technology. Moreover, our licensors may own or control intellectual property that has not been licensed to us and, as a result, we may be subject to claims, regardless of their merit, that we are infringing or otherwise violating the licensor's rights. In addition, while we cannot determine currently the amount of the royalty obligations we would be required to pay on sales of future products, if any, the amounts may be significant. The amount of our future royalty obligations will depend on the technology and intellectual property we use in products that we successfully develop and commercialize, if any. Therefore, even if we successfully develop and commercialize products, we may be unable to achieve or maintain profitability.

Moreover, disputes may arise regarding intellectual property subject to a licensing agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the extent to which our product candidates, technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- the sublicensing of patent and other rights under our collaborative development relationships;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the inventorship and ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners; and
- the priority of invention of patented technology.

In addition, the agreements under which we currently license intellectual property or technology from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations, and prospects. Moreover, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates, which could have a material adverse effect on our business, financial conditions, results of operations, and prospects.

We may be subject to claims that we or our employees or consultants have wrongfully used or disclosed alleged trade secrets of our employees' or consultants' former employers or their clients. These claims may be costly to defend and if we do not successfully do so, we may be required to pay monetary damages and may lose valuable intellectual property rights or personnel.

Many of our employees were previously employed at universities or biotechnology or biopharmaceutical companies, including our competitors or potential competitors. Although no claims against us are currently pending, we may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these claims. If we fail in defending such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. A loss of key research personnel or their work product could hamper our ability to commercialize, or prevent us from commercializing, our product candidates, which could severely harm our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to management.

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

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

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

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. We have systems in place to remind us to pay these fees, and we employ an outside firm and/or rely on our outside counsel to pay these fees due to non-U.S. patent agencies. The USPTO and various non-U.S. governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market and this circumstance would have a material adverse effect on our business.

Changes in U.S. patent and ex-U.S. patent laws could diminish the value of patents in general, thereby impairing our ability to protect our products.

Changes in either the patent laws or interpretation of the patent laws in the United States or in other ex-U.S. jurisdictions could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. In the United States, numerous recent changes to the patent laws and proposed changes to the rules of the USPTO that may have a significant impact on our ability to protect our technology and enforce our intellectual property rights. For example, the America Invents Act, enacted within the last several years involves significant changes in patent legislation. The U.S. Supreme Court has ruled on several patent cases in recent years, some of which cases either narrow the scope of patent protection available in certain circumstances or weaken the rights of patent owners in certain situations. For example, the decision by the U.S. Supreme Court in Association for Molecular Pathology v. Myriad Genetics, Inc. precludes a claim to a nucleic acid having a stated nucleotide sequence that is identical to a sequence found in nature and unmodified. We currently are not aware of an immediate impact of this decision on our patents or patent applications because we are developing product candidates that contain modifications that we believe are not found in nature. However, this decision has yet to be clearly interpreted by courts and by the USPTO. We cannot assure you that the interpretations of this decision or subsequent rulings will not adversely impact our patents or patent applications. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts and the USPTO, and similar legislative and regulatory bodies in other countries in which we may pursue patent protection, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

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 trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names or may be forced to stop using these names, which we need for name recognition by potential partners or customers in our markets of interest. If we are unable to establish name recognition based on our trademarks and trade names, we may not be able to compete effectively, which could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Risks Related to Government Regulation

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. If we are unable to develop, obtain regulatory approval for and commercialize our product candidates, or experience significant delays in doing so, our business will be materially harmed.

All of our product candidates are in preclinical or early clinical development and their risk of failure is high. It is impossible to predict when or if any of our product candidates will receive regulatory approval. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical studies and then conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the development process. The results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits, despite having progressed through preclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or safety profiles, notwithstanding promising results in earlier trials.

We commenced a Phase 1 clinical trial of STRO-001, an ADC directed against CD74, for certain cancers in April 2018. We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019. Commencing our future clinical trials is subject to finalizing the trial design and submitting an IND or similar submission with the FDA or similar foreign regulatory authority. Even after we submit our IND or comparable submissions in other jurisdictions, the FDA or other regulatory authorities could disagree that we have satisfied their requirements to commence our clinical trials or disagree with our study design, which may require us to complete additional preclinical studies or amend our protocols or impose stricter conditions on the commencement of clinical trials.

We or our collaborators may experience delays in completing our preclinical studies and initiating or completing clinical trials of our product candidates. We do not know whether planned preclinical studies and clinical trials will be completed on schedule or at all, or whether planned clinical trials will begin on time, need to be redesigned, have patients enrolled on time or be completed on schedule, if at all. We or our collaborators may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent our ability to receive marketing approval to commercialize our product candidates. Our development programs may be delayed for a variety of reasons, including delays related to:

- the FDA or other regulatory authorities requiring us or our collaborators to submit additional data or imposing other requirements before permitting us to initiate a clinical trial;
- obtaining regulatory approval to commence a clinical trial;
- the FDA or other regulatory authorities placing a clinical trial on clinical hold;
- a temporary U.S. federal government shutdown;
- reaching agreement on acceptable terms with prospective CROs and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical trial sites;
- clinical trials of our product candidates producing negative or inconclusive results, and we or our collaborators deciding, or regulators requiring us, to conduct additional clinical trials, including testing in more subjects, or abandoning product development programs;
- third-party contractors used by us or our collaborators failing to comply with regulatory requirements or meeting their contractual obligations in a timely manner, or at all;
- obtaining institutional review board, or IRB, approval at each clinical trial site;
- recruiting suitable patients to participate in a clinical trial;
- developing and validating any companion diagnostic that would be used in a clinical trial;
- cost of clinical trials being greater than anticipated;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates being insufficient or inadequate;
- having patients complete a clinical trial or return for post-treatment follow-up;
- clinical trial sites deviating from trial protocol or dropping out of a trial;
- adding new clinical trial sites; or
- manufacturing sufficient quantities of our product candidates for use in clinical trials.

Patient enrollment, a significant factor in the timing of clinical trials, is affected by many factors including the size and nature of the patient population, the proximity of patients to clinical sites, the eligibility criteria for the trial, the design of the clinical trial, competing clinical trials and clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to other available therapies, including any new drugs or therapeutic biologics that may be approved for the indications being investigated by us. Furthermore, we expect to rely on our collaborators, CROs and clinical trial sites to ensure the proper and timely conduct of our clinical trials and, while we expect to enter into agreements governing their committed activities, we have limited influence over their actual performance.

We could encounter delays if prescribing physicians encounter unresolved ethical issues associated with enrolling patients in clinical trials of our product candidates in lieu of prescribing existing treatments that have established safety and efficacy profiles.

Further, a clinical trial may be suspended or terminated by us, our collaborators, the IRBs of the institutions in which such trials are being conducted, the Data Safety Monitoring Board for such trial or placed on clinical hold by the FDA or other regulatory authorities due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by 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 or therapeutic biologic, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. If we experience delays in the completion of, or termination of, any clinical trial of our product candidates, the commercial prospects of our product candidates will be harmed, and our ability to generate product revenues from any of these product candidates will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow down our product development and approval process and jeopardize our ability to commence product sales and generate revenues. Any of these occurrences could materially and adversely affect our business, financial condition, results of operations and prospects. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates.

We and/or our collaborators may be unable to obtain, or may be delayed in obtaining, U.S. or foreign regulatory approval and, as a result, unable to commercialize our product candidates.

Our product candidates are subject to extensive governmental regulations relating to, among other things, research, testing, development, manufacturing, safety, efficacy, approval, recordkeeping, reporting, labeling, storage, packaging, advertising and promotion, pricing, marketing and distribution of drugs and therapeutic biologics. Rigorous preclinical testing and clinical trials and an extensive regulatory approval process are required to be completed successfully in the United States and in many foreign jurisdictions before a new drug or therapeutic biologic can be marketed. Satisfaction of these and other regulatory requirements is costly, time consuming, uncertain and subject to unanticipated delays. It is possible that none of the product candidates we may develop, either alone or with our collaborators, will obtain the regulatory approvals necessary for us or our existing or future collaborators to begin selling them.

Although our employees have experience in conducting and managing clinical trials from prior employment at other companies, we, as a company, have no prior experience in conducting and managing the clinical trials necessary to obtain regulatory approvals, including approval by the FDA. The time required to obtain FDA and other approvals is unpredictable but typically takes many years following the commencement of clinical trials, depending upon the type, complexity and novelty of the product candidate, and may be further delayed due to one or more temporary federal government shutdowns. The standards that the FDA and its foreign counterparts use when regulating us require judgment and can change, which makes it difficult to predict with certainty their application. Any analysis we perform of data from preclinical and clinical activities is subject to confirmation and interpretation by regulatory authorities, which could delay, limit or prevent regulatory approval. We or our collaborators may also encounter unexpected delays or increased costs due to new government regulations, for example, from future legislation or administrative action, or from changes in FDA policy during the period of product development, clinical trials and FDA regulatory review. It is impossible to predict whether legislative changes will be enacted, or whether FDA or foreign regulations, guidance or interpretations will be changed, or the impact of such changes, if any. Given that the product candidates we are developing, either alone or with our collaborators, represent a new approach to the manufacturing and type of therapeutic biologics, the FDA and its foreign counterparts have not yet established any definitive policies, practices or guidelines in relation to these product candidates. Moreover, the FDA may respond to any BLA that we may submit by defining requirements that we do not anticipate. Such responses could delay clinical development of our product candidates. In addition, because there may be approved treatments for some of the diseases for which we may seek approval, in order to receive regulatory approval, we may need to demonstrate through clinical trials that the product candidates we develop to treat these diseases, if any, are not only safe and effective, but safer or more effective than existing products. Furthermore, in recent years, there has been increased public and political pressure on the FDA with respect to the approval process for new drugs and therapeutic biologics, and FDA standards, especially regarding product safety, appear to have become more stringent.

Any delay or failure in obtaining required approvals could have a material and adverse effect on our ability to generate revenues from the particular product candidate for which we are seeking approval. Furthermore, any regulatory approval to market a product may be subject to limitations on the approved uses for which we may market the product or on the labeling or other restrictions. In addition, the FDA has the authority to require a risk evaluation and mitigation strategies, or REMS, plan as part of a BLA or after approval, which may impose further requirements or restrictions on the distribution or use of an approved biologic, such as limiting prescribing to certain physicians or medical centers that have undergone specialized training, limiting treatment to patients who meet certain safe-use criteria and requiring treated patients to enroll in a registry. These limitations and restrictions may limit the size of the market for the product and affect reimbursement by third-party payors.

We are also subject to numerous foreign regulatory requirements governing, among other things, the conduct of clinical trials, manufacturing and marketing authorization, pricing and third-party reimbursement. The foreign regulatory approval process varies among countries and may include all of the risks associated with FDA approval process described above, as well as risks attributable to the satisfaction of local regulations in foreign jurisdictions. Moreover, the time required to obtain approval may differ from that required to obtain FDA approval. FDA approval does not ensure approval by regulatory authorities outside the United States and vice versa. Any delay or failure to obtain U.S. or foreign regulatory approval for a product candidate could have a material and adverse effect on our business, financial condition, results of operations and prospects.

Delays in obtaining regulatory approval of our manufacturing process may delay or disrupt our commercialization efforts. To date, no product using a cell-free manufacturing process in the United States has received approval from the FDA.

Before we can begin to commercially manufacture our product candidates in third-party or our own facilities, we must obtain regulatory approval from the FDA for a BLA that describes in detail the chemistry, manufacturing, and controls for the product. A manufacturing authorization must also be obtained from the appropriate EU regulatory authorities. The timeframe required to obtain such approval or authorization is uncertain. In addition, we must pass a pre-approval inspection of our manufacturing facility by the FDA before any of our product candidates can obtain marketing approval, if ever. In order to obtain approval, we will need to ensure that all of our processes, methods and equipment are compliant with cGMP, and perform extensive audits of vendors, contract laboratories and suppliers. If any of our vendors, contract laboratories or suppliers is found to be out of compliance with cGMP, we may experience delays or disruptions in manufacturing while we work with these third parties to remedy the violation or while we work to identify suitable replacement vendors. The cGMP requirements govern quality control of the manufacturing process and documentation policies and procedures. In complying with cGMP, we will be obligated to expend time, money and effort in production, record keeping and quality control to assure that the product meets applicable specifications and other requirements. If we fail to comply with these requirements, we would be subject to possible regulatory action and may not be permitted to sell any products that we may develop.

Even if we receive regulatory approval for any of our product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense. Additionally, our product candidates, if approved, could be subject to labeling and other restrictions and market withdrawal. We may also be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our products.

Any regulatory approvals that we or our existing or future collaborators obtain for our product candidates may also be subject to limitations on the approved indicated uses for which a product may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase 4 clinical trials, and surveillance to monitor the safety and efficacy of the product candidate.

In addition, if the FDA or a comparable foreign regulatory authority approves any of our product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, import, export, advertising, promotion and recordkeeping for the product will be subject to extensive and ongoing regulatory requirements. The FDA has significant post-market authority, including the authority to require labeling changes based on new safety information and to require post-market studies or clinical trials to evaluate safety risks related to the use of a product or to require withdrawal of the product from the market. The FDA also has the authority to require a REMS plan after approval, which may impose further requirements or restrictions on the distribution or use of an approved drug or therapeutic biologic. The manufacturing facilities we use to make a future product, if any, will also be subject to periodic review and inspection by the FDA and other regulatory agencies, including for continued compliance with cGMP requirements. The discovery of any new or previously unknown problems with our third-party manufacturers, manufacturing processes or facilities may result in restrictions on the product, manufacturer or facility, including withdrawal of the product from the market. If we rely on third-party manufacturers, we will not have control over compliance with applicable rules and regulations by such manufacturers. Any product promotion and advertising will also be subject to regulatory requirements and continuing regulatory review. If we or our existing or future collaborators, manufacturers or service providers fail to comply with applicable continuing regulatory requirements in the United States or foreign jurisdictions in which we seek to market our products, we or they may be subject to, among other things, fines, warning letters, holds on clinical trials, delay of approval or refusal by the FDA or similar foreign regulatory bodies to approve pending applications or supplements to approved applications, suspension or withdrawal of regulatory approval, product recalls and seizures, administrative detention of products, refusal to permit the import or export of products, operating restrictions, injunction, civil penalties and criminal prosecution.

Subsequent discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of the product, withdrawal of the product from the market or voluntary or mandatory product recalls;
- fines, warning or untitled letters or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or our strategic partners;
- suspension or revocation of product license approvals;
- product seizure or detention or refusal to permit the import or export of products; and
- injunctions or the imposition of civil or criminal penalties.

The FDA policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. For example, in December 2016, the 21st Century Cures Act, or Cures Act, was signed into law. The Cures Act, among other things, is intended to modernize the regulation of drugs and biologics and to spur innovation, but its ultimate implementation is unclear. 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, which would adversely affect our business.

We also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or abroad. For example, certain policies of the current U.S. presidential administration may impact our business and industry. Namely, the current U.S. presidential 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 regulatory and oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. Notably, on January 23, 2017, the current U.S. presidential administration ordered a hiring freeze for all executive departments and agencies, including the FDA, which prohibited the FDA from filling employee vacancies or creating new positions. Under the terms of the executive order, the freeze was to remain in effect until implementation of a plan recommended by the Director for the Office of Management and Budget, or OMB, in consultation with the Director of the Office of Personnel Management, to reduce the size of the federal workforce through attrition. While the general hiring freeze was lifted on April 12, 2017, the FDA remained under a hiring freeze until May 25, 2017. However, the fiscal 2018 budget proposal for the FDA still calls for overall reductions in the FDA workforce, mostly through attrition. We believe an under-staffed FDA could result in delays in the FDA's responsiveness or in its ability to review submissions or applications, issue regulations or guidance, or implement or enforce regulatory requirements in a timely fashion or at all. Moreover, on January 30, 2017, the current U.S. presidential administration issued an executive order, applicable to all executive agencies, including the FDA, which requires that for each notice of proposed rulemaking or final regulation to be issued in fiscal year 2017, the agency shall identify at least two existing regulations to be repealed, unless prohibited by law. These requirements are referred to as the "two-for-one" provisions. This executive order includes a budget neutrality provision that requires the total incremental cost of all new regulations in the 2017 fiscal year, including repealed regulations, to be no greater than zero, except in limited circumstances. For fiscal years 2018 and beyond, the executive order requires agencies to identify regulations to offset any incremental cost of a new regulation and approximate the total costs or savings associated with each new regulation or repealed regulation. In interim guidance issued by the Office of Information and Regulatory Affairs within OMB on February 2, 2017, the administration indicates that the "two-for-one" provisions may apply not only to agency regulations, but also to significant agency guidance documents. It is difficult to predict how these requirements 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 constraints on the FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted.

We may face difficulties from healthcare legislative reform measures.

Existing regulatory policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. 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.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Healthcare and Education Reconciliation Act, or together, the ACA, was enacted, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The ACA, among other things, (i) subjected therapeutic biologics to potential competition by lower-cost biosimilars by creating a licensure framework for follow on biologic products, (ii) proscribed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs and therapeutic biologics that are inhaled, infused, instilled, implanted or injected, (iii) increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extended the rebate program to individuals enrolled in Medicaid managed care organizations, (iv) established annual fees and taxes on manufacturers of certain branded prescription drugs and therapeutic biologics, (v) established a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs and therapeutic biologics to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs and therapeutic biologics to be covered under Medicare Part D, (vi) expanded eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability, (vii) expanded the entities eligible for discounts under the Public Health program (viii) created a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research and (ix) established 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.

The current U.S. presidential administration and U.S. Congress have sought, and we expect they will continue to, seek to modify, repeal, or otherwise invalidate all, or certain provisions of, the ACA. Since January 2017, the current U.S. presidential administration has issued two executive orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. For example, on October 12, 2017, the current U.S. presidential administration issued an executive order that expands the use of association health plans and allows anyone to purchase short-term health plans that provide temporary, limited insurance. This executive order also calls for the halt of federal payments to health insurers for cost-sharing reductions previously available to lower-income Americans to afford coverage. There is still uncertainty with respect to the impact this executive order could have on coverage and reimbursement for healthcare items and services covered by plans that were authorized by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Reform Act, among other things, 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 January 22, 2018, the current U.S. presidential administration signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, or the BBA, among other things, amended the ACA, effective January 1, 2019, to increase from 50% to 70% the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in Medicare Part D and to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole". More recently, in July 2018, CMS published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. There is still uncertainty with respect to the impact the current U.S. presidential administration and Congress may have, if any, and any changes will likely take time to unfold, and could have an impact on coverage and reimbursement for healthcare items and services covered by plans that were authorized by the ACA. However, we cannot predict the ultimate content, timing or effect of any healthcare reform legislation or the impact of potential legislation on us.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA was enacted to reduce healthcare expenditures. U.S. federal government agencies also currently face potentially significant spending reductions, which may further impact healthcare expenditures. On August 2, 2011, the Budget Control Act of 2011 among other things, created measures for spending reductions by Congress. A joint select committee on deficit reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year. These reductions went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. Moreover, on January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, 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. If federal spending is further reduced, anticipated budgetary shortfalls may also impact the ability of relevant agencies, such as the FDA or the National Institutes of Health to continue to function at current levels. Amounts allocated to federal grants and contracts may be reduced or eliminated. These reductions may also impact the ability of relevant agencies to timely review and approve research and development, manufacturing, and marketing activities, which may delay our ability to develop, market and sell any products we may develop.

Moreover, payment methodologies, including payment for companion diagnostics, may be subject to changes in healthcare legislation and regulatory initiatives. For example, the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or MMA, changed the way Medicare covers and pays for pharmaceutical products. The legislation expanded Medicare coverage for drug purchases by the elderly and introduced a new reimbursement methodology based on average sales prices for physician-administered drugs. In addition, this legislation provided authority for limiting the number of drugs that will be covered in any therapeutic class. While the MMA only applies to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates. Therefore, any reduction in reimbursement that results from the MMA may result in a similar reduction in payments from private payors. In addition, CMS has begun bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting and, beginning in 2018, CMS will pay for clinical laboratory services based on a weighted average of reported prices that private payors, Medicare Advantage plans, and Medicaid Managed Care plans pay for laboratory services. Further, on March 16, 2018, CMS finalized its National Coverage Determination, or NCD, for certain diagnostic laboratory tests using next generation sequencing that are approved by the FDA as a companion *in vitro* diagnostic and used in a cancer with an FDA-approved companion diagnostic indication. Under the NCD, diagnostic tests that gain FDA approval or clearance as an *in vitro* companion diagnostic will automatically receive full coverage and be available for patients with recurrent, metastatic relapsed, refractory or stages III and IV cancer. Additionally, the NCD extended coverage to repeat testing when the patient has a new primary diagnosis of cancer.

Recently there has 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 and enacted federal and state legislation 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. At the federal level, the current U.S. presidential administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, on May 11, 2018, the current U.S. presidential administration laid out the administration's "Blueprint" to reduce the cost of prescription medications while preserving innovation and cures. While the Department of Health and Human Services, or HHS, is soliciting feedback on some of these measures, other actions may be immediately implemented by HHS under existing authority. Although a number of these, and other potential, proposals will require authorization through additional legislation to become effective, Congress and the current U.S. presidential administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures are increasingly 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. We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or companion diagnostics or additional pricing pressures.

Additionally, on May 30, 2018, the Trickett Wendler, Frank Mongiello, Jordan McLinn, and Matthew Bellina Right to Try Act of 2017 was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug products that have completed a Phase I clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA authorization under an FDA expanded access program.

We expect that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved product. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability, or commercialize our products.

Our operations and relationships with healthcare providers, healthcare organizations, customers and third-party payors will be subject to applicable anti-bribery, anti-kickback, fraud and abuse, transparency and other healthcare laws and regulations, which could expose us to, among other things, enforcement actions, criminal sanctions, civil penalties, contractual damages, reputational harm, administrative burdens and diminished profits and future earnings.

Our current and future arrangements with healthcare providers, healthcare organizations, third-party payors and customers expose us to broadly applicable anti-bribery, fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we research, market, sell and distribute our product candidates. In addition, we may be subject to patient data privacy and security regulation by the U.S. federal government and the states and the foreign governments in which we conduct our business. Restrictions under applicable federal and state anti-bribery and healthcare laws and regulations, include the following:

- the federal Anti-Kickback Statute, which prohibits, among other things, individuals and entities from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a federal and state healthcare program 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 federal criminal and civil false claims and civil monetary penalties laws, including the federal False Claims Act, which can be imposed through civil whistleblower or qui tam actions against individuals or entities, prohibits, among other things, knowingly presenting, or causing to be presented, to the federal government, claims for payment 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 federal government. In addition, certain marketing practices, including off-label promotion, may also violate false claims laws. Moreover, the government may assert that a claim including items and services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal False Claims Act;
- HIPAA, which imposes criminal and civil liability, prohibits, 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 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;
- HIPAA, as amended by HITECH, which impose obligations on certain healthcare providers, health plans, and healthcare clearinghouses, known as covered entities, as well as their business associates that perform certain services involving the storage, use or disclosure of individually identifiable health information, including mandatory contractual terms, with respect to safeguarding the privacy, security, and transmission of individually identifiable health information, and require notification to affected individuals and regulatory authorities of certain breaches of security of individually identifiable health information;
- the federal legislation commonly referred to as Physician Payments Sunshine Act, enacted as part of the ACA, and its implementing regulations, which requires certain manufacturers of covered drugs, devices, biologics and medical supplies that are reimbursable under Medicare, Medicaid, or the Children's Health Insurance Program, with certain exceptions, to report annually to CMS information related to certain payments and other transfers of value to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members, with the information made publicly available on a searchable website; effective January 1, 2022, transfers of value to physician assistants, nurse practitioners or clinical nurse specialists, certified registered nurse anesthetists, and certified nurse-midwives must also be reported;

- the U.S. Foreign Corrupt Practices Act of 1977, as amended, which prohibits, among other things, U.S. companies and their employees and agents from authorizing, promising, offering, or providing, directly or indirectly, corrupt or improper payments or anything else of value to foreign government officials, employees of public international organizations and foreign government owned or affiliated entities, candidates for foreign political office, and foreign political parties or officials thereof;
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, that may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; and
- certain state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug and therapeutic biologics manufacturers to report information related to payments to physicians and other healthcare providers or marketing expenditures and pricing information, state and local laws that require the registration of pharmaceutical sales representatives, and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

If we or our collaborators, manufacturers or service providers fail to comply with applicable federal, state or foreign laws or regulations, we could be subject to enforcement actions, which could affect our ability to develop, market and sell our products successfully and could harm our reputation and lead to reduced acceptance of our products by the market. These enforcement actions include, among others:

- exclusion from participation in government-funded healthcare programs; and
- exclusion from eligibility for the award of government contracts for our products.

Efforts to ensure that our current and future business arrangements with third parties comply with applicable healthcare laws and regulations could 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 such requirements, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, the curtailment or restructuring of our operations, loss of eligibility to obtain approvals from the FDA, exclusion from participation in government contracting, healthcare reimbursement or other government programs, including Medicare and Medicaid, integrity oversight and reporting obligations, or reputational harm, any of which could adversely affect our financial results. Although effective compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, these risks cannot be entirely eliminated. Any action against us for an alleged or suspected violation could cause us to incur significant legal expenses and could divert our management's attention from the operation of our business, even if our defense is successful. In addition, achieving and sustaining compliance with applicable laws and regulations may be costly to us in terms of money, time and resources.

Even if we are able to commercialize any product candidate, such product candidate may become subject to unfavorable pricing regulations or third-party coverage and reimbursement policies, which would harm our business.

The regulations that govern regulatory approvals, pricing and reimbursement for new drugs and therapeutic biologics vary widely from country to country. Some countries require approval of the sale price of a drug or therapeutic biologic before it can be marketed. In many countries, the pricing review period begins after marketing approval is granted. In some foreign markets, prescription biopharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain regulatory approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods and negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain regulatory approval.

Our ability to commercialize any products successfully also will depend in part on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from government authorities, private health insurers and other organizations. Even if we succeed in bringing one or more products to the market, these products may not be considered cost-effective, and the amount reimbursed for any products may be insufficient to allow us to sell our products on a competitive basis. Because our programs are in the early stages of development, we are unable at this time to determine their cost effectiveness or the likely level or method of coverage and reimbursement. Increasingly, the third-party payors who reimburse patients or healthcare providers, such as government and private insurance plans, are requiring that drug companies provide them with predetermined discounts from list prices, and are seeking to reduce the prices charged or the amounts reimbursed for biopharmaceutical products. If the price we are able to charge for any products we develop, or the coverage and reimbursement provided for such products, is inadequate in light of our development and other costs, our return on investment could be affected adversely.

There may be significant delays in obtaining reimbursement for newly approved drugs or therapeutic biologics, and coverage may be more limited than the purposes for which the drug or therapeutic biologic is approved by the FDA or similar foreign regulatory authorities. Moreover, eligibility for reimbursement does not imply that any drug or therapeutic biologic will be reimbursed in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution.

Interim reimbursement levels for new drugs or therapeutic biologics, if applicable, may also be insufficient to cover our costs and may not be made permanent. Reimbursement rates may be based on payments allowed for lower cost drugs or therapeutic biologics that are already reimbursed, may be incorporated into existing payments for other services and may reflect budgetary constraints or imperfections in Medicare data. Net prices for drugs or therapeutic biologics may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs or therapeutic biologics from countries where they may be sold at lower prices than in the United States. Further, no uniform policy for coverage and reimbursement exists in the United States, and coverage and reimbursement can differ significantly from payor to payor. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. Our inability to promptly obtain coverage and adequate reimbursement rates from both government-funded and private payors for new drugs or therapeutic biologics that we develop and for which we obtain regulatory approval could have a material and adverse effect on our business, financial condition, results of operations and prospects.

If in the future we are unable to establish U.S. or global sales and marketing capabilities or enter into agreements with third parties to sell and market our product candidates, we may not be successful in commercializing our product candidates if they are approved and we may not be able to generate any revenue.

We currently do not have a marketing or sales team for the marketing, sales and distribution of any of our product candidates that are able to obtain regulatory approval. To commercialize any product candidates after approval, we must build on a territory-by-territory basis 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 our product candidates receive regulatory approval, we may decide to establish an internal sales or marketing team with technical expertise and supporting distribution capabilities to commercialize our product candidates, which will be expensive and time consuming and will require significant attention of our executive officers to manage. For example, some state and local jurisdictions have licensing and continuing education requirements for pharmaceutical sales representatives, which requires time and financial resources. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of any of our product candidates that we obtain approval to market.

With respect to the commercialization of all or certain of our product candidates, we may choose to collaborate, either globally or on a territory-by-territory basis, 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 when needed on acceptable terms, or at all, we may not be able to successfully commercialize any of our product candidates that receive regulatory approval or any such commercialization may experience delays or limitations. If we are not successful in commercializing our product candidates, either on our own or through collaborations with one or more third parties, our future product revenue will suffer and we may incur significant additional losses.

Our product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

With the enactment of the Biologics Price Competition and Innovation Act of 2009, or BPCIA, an abbreviated pathway for the approval of biosimilar and interchangeable biological products was created. The abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as interchangeable based on its similarity to an existing reference product. The BPCIA provides a period of exclusivity for products granted "reference product exclusivity," under which an application for a biosimilar product referencing such products cannot be approved by the FDA until 12 years after the original branded product is approved under a BLA. On March 6, 2015, the FDA approved the first biosimilar product under the BPCIA. FDA has accelerated licensure of biosimilar products since the first biosimilar was approved in 2015. However, FDA has yet to deem a biosimilar product interchangeable with the reference product. While FDA has implemented certain procedures intended to implement the BPCIA, other processes remain in development and may be adopted by the FDA; any such processes could have a material adverse effect on the future commercial prospects for our biological products.

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

If any of our product candidates receives marketing approval and we or others later identify undesirable side effects caused by the product candidates, our ability to market and derive revenue from the product candidates could be compromised.

Undesirable side effects caused by our product candidates could cause regulatory authorities to interrupt, delay or halt clinical trials and could result in more restrictive labeling or the delay or denial of regulatory approval by the FDA or other regulatory authorities. We have only recently initiated our first clinical trials for our first two product candidates. Given the nature of ADCs, it is likely that there may be side effects associated with their use. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects. In such an event, our clinical trials could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development of or deny approval of our product candidates for any or all targeted indications. Such side effects could also affect patient recruitment or the ability of enrolled patients to complete the clinical trials or result in potential product liability claims. Any of these occurrences may materially and adversely affect our business, financial condition, results of operations and prospects.

Further, clinical trials by their nature utilize a sample of the potential patient population. With a limited number of patients and limited duration of exposure, rare and severe side effects of our product candidates may only be uncovered with a significantly larger number of patients exposed to the product candidate.

In the event that any of our product candidates receive regulatory approval and we or others identify undesirable side effects caused by one of our products, any of the following adverse events could occur:

- regulatory authorities may withdraw their approval of the product or seize the product;
- we may be required to recall the product or change the way the 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;
- we may be subject to fines, injunctions or the imposition of civil or criminal penalties;
- regulatory authorities may require the addition of labeling statements, such as a black boxed warning or a contraindication;
- we may be required to 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 these occurrences could have a material and adverse effect on our business, financial condition, results of operations and prospects.

If we decide to pursue a Fast Track Designation by the FDA, it may not lead to a faster development or regulatory review or approval process.

We may seek Fast Track Designation for one or more of our product candidates. If a drug or biologic is intended for the treatment of a serious or life-threatening condition and the drug or biologic demonstrates the potential to address unmet medical needs for this condition, the product sponsor may apply for FDA Fast Track Designation. The FDA has broad discretion whether or not to grant this designation, so even if we believe a particular product candidate is eligible for this designation, we cannot assure you that the FDA would decide to grant it. Even if we do receive Fast Track Designation, we may not experience a faster development process, review or approval compared to conventional FDA procedures. The FDA may withdraw Fast Track Designation if it believes that the designation is no longer supported by data from our clinical development program.

While we have been granted Orphan Drug Designation by the FDA for STRO-001 for the treatment of multiple myeloma, if we decide to seek Orphan Drug Designation for some of our other product candidates, we may be unsuccessful or may be unable to maintain the benefits associated with Orphan Drug Designation, including the potential for orphan drug exclusivity.

We have been granted Orphan Drug Designation by the FDA for STRO-001 for the treatment of multiple myeloma. As part of our business strategy, we may seek Orphan Drug Designation for our other product candidates, and we may be unsuccessful. Regulatory authorities in some jurisdictions, including the United States and Europe, may designate drugs and therapeutic biologics for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may designate a drug or therapeutic biologic as an orphan drug if it is a drug or therapeutic biologic intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 in the United States where there is no reasonable expectation that the cost of developing the drug or therapeutic biologic will be recovered from sales in the United States. In the United States, Orphan Drug Designation entitles a party to financial incentives such as opportunities for grant funding toward clinical trial costs, tax advantages and user fee waivers. In addition, if a product that has Orphan Drug Designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications, including a full BLA, to market the same product 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 where the manufacturer is unable to assure sufficient product quantity.

Even if we obtain Orphan Drug Designation for our product candidates in specific indications, we may not be the first to obtain marketing approval of these product candidates for the orphan-designated indication due to the uncertainties associated with developing pharmaceutical products. In addition, exclusive marketing rights in the United States may be limited if we seek approval for an indication broader than the orphan-designated indication or may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. Further, even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs or therapeutic biologics with different principal molecular structural features can be approved for the same condition. Even after an orphan product is approved, the FDA can subsequently approve the same drug or therapeutic biologic with the same principal molecular structural features for the same condition if the FDA concludes that the later drug or therapeutic biologic 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 therapeutic biologic nor gives the drug or therapeutic biologic any advantage in the regulatory review or approval process. In addition, while we may seek Orphan Drug Designation for our product candidates, we may never receive such designations.

The recent tax reform legislation, which was signed into law on December 22, 2017 reduced the amount of the qualified clinical research costs for a designated orphan product that a sponsor may claim as a credit from 50% to 25%. This may further limit the advantage and may impact our future business strategy of seeking the Orphan Drug Designation.

Risks Related to Our Common Stock

Our quarterly and annual operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline.

We expect our operating results to be subject to quarterly and annual fluctuations. Our net loss and other operating results will be affected by numerous factors, including:

- variations in the level of expense related to the ongoing development of our XpressCF™ Platform, our product candidates or future development programs;
- results of preclinical and clinical trials, or the addition or termination of clinical trials or funding support by us, or existing or future collaborators or licensing partners;
- our execution of any additional collaboration, licensing or similar arrangements, and the timing of payments we may make or receive under existing or future arrangements or the termination or modification of any such existing or future arrangements;
- any intellectual property infringement lawsuit or opposition, interference or cancellation proceeding in which we may become involved;
- additions and departures of key personnel;
- strategic decisions by us or our competitors, such as acquisitions, divestitures, spin-offs, joint ventures, strategic investments or changes in business strategy;
- if any of our product candidates receives regulatory approval, the terms of such approval and market acceptance and demand for such product candidates;
- regulatory developments affecting our product candidates or those of our competitors; and
- changes in general market and economic conditions.

If our quarterly and annual operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly and annual fluctuations in our operating results may, in turn, cause the price of our common stock to fluctuate substantially. We believe that quarterly and annual comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

The market price of our stock may be volatile, and you could lose all or part of your investment.

The trading price of our common stock may be highly volatile and subject to wide fluctuations in response to various factors, some of which we cannot control. As a result of this volatility, investors may not be able to sell their common stock at or above the purchase price. The market price for our common stock may be influenced by many factors, including the other risks described in this section and the following:

- results of preclinical studies and clinical trials of our product candidates, or those of our competitors or our existing or future collaborators;
- regulatory or legal developments in the United States and other countries, especially changes in laws or regulations applicable to our product candidates;
- the success of competitive products or technologies;
- introductions and announcements of new products by us, our future commercialization partners, or our competitors, and the timing of these introductions or announcements;
- actions taken by regulatory agencies with respect to our products, clinical studies, manufacturing process or sales and marketing terms;
- actual or anticipated variations in our financial results or those of companies that are perceived to be similar to us;
- the success of our efforts to acquire or in-license additional technologies, products or product candidates;
- developments concerning current or future collaborations, including but not limited to those with our sources of manufacturing supply and our commercialization partners;
- market conditions in the pharmaceutical and biotechnology sectors;
- announcements by us or our competitors of significant acquisitions, strategic collaborations, joint ventures or capital commitments;

- developments or disputes concerning patents or other proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our product candidates and products;
- our ability or inability to raise additional capital and the terms on which we raise it;
- the recruitment or departure of key personnel;
- changes in the structure of healthcare payment systems;
- actual or anticipated changes in earnings estimates or changes in stock market analyst recommendations regarding our common stock, other comparable companies or our industry generally;
- our failure or the failure of our competitors to meet analysts' projections or guidance that we or our competitors may give to the market;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- announcement and expectation of additional financing efforts;
- speculation in the press or investment community;
- trading volume of our common stock;
- sales of our common stock by us or our stockholders;
- the concentrated ownership of our common stock;
- changes in accounting principles;
- terrorist acts, acts of war or periods of widespread civil unrest;
- natural disasters and other calamities;
- a temporary federal government shutdown; and
- general economic, industry and market conditions.

In addition, the stock market in general, and the markets for pharmaceutical, biopharmaceutical and biotechnology stocks in particular, have experienced extreme price and volume fluctuations that have been often unrelated or disproportionate to the operating performance of the issuer. These broad market and industry factors may seriously harm the market price of our common stock, regardless of our actual operating performance. The realization of any of the above risks or any of a broad range of other risks, including those described in this "Risk Factors" section, could have a dramatic and adverse impact on the market price of our common stock.

The future sale and issuance of equity or of debt securities that are convertible into equity will dilute our share capital.

We may choose to raise additional capital in the future, depending on market conditions, strategic considerations and operational requirements. To the extent that additional capital is raised through the sale and issuance of shares or other securities convertible into shares, our stockholders will be diluted. Future issuances of our common stock or other equity securities, or the perception that such sales may occur, could adversely affect the trading price of our common stock and impair our ability to raise capital through future offerings of shares or equity securities. No prediction can be made as to the effect, if any, that future sales of common stock or the availability of common stock for future sales will have on the trading price of our common stock.

A sale of a substantial number of shares of our common stock may cause the price of our common stock to decline.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. If our stockholders sell, or the market perceives that our stockholders intend to sell, substantial amounts of our common stock in the public market before or after the lock-up and other legal restrictions on resale lapse in connection with our IPO, the market price of our common stock could decline significantly. Each of our officers, directors, substantially all of our stockholders and participants in our directed share program entered into lock-up agreements with the underwriters that restricted their ability to sell or transfer their shares. These lock-up agreements pertaining to our IPO expired March 25, 2019. Due to this expiration of the lock-up agreements, a substantial number of shares of common stock recently became eligible for sale in the public market.

We cannot predict what effect, if any, sales of our shares in the public market or the availability of shares for sale will have on the market price of our common stock. However, future sales of substantial amounts of our common stock in the public market, including shares issued upon exercise of outstanding options or warrants, or the perception that such sales may occur, could adversely affect the market price of our common stock.

We also expect that significant additional capital may be needed in the future to continue our planned operations. To raise capital, we may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to 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.

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 will be influenced by the research and reports that industry or securities analysts publish about us or our business. We do not have any control over the analysts or the content and opinions included in their reports. If any of the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, financial condition and results of operations, our intellectual property or our stock performance, or if our preclinical studies and clinical trials and operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of such 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 a decline in our stock price or trading volume.

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.

Based on the beneficial ownership of our common stock as of December 31, 2018, our executive officers, directors and affiliates beneficially owned 38.2% of our outstanding voting stock. As a result, these stockholders, if acting together, could have significant influence over the outcome of corporate actions requiring stockholder approval, including the election of directors, amendment of our organizational documents, any merger, consolidation or sale of all or substantially all of our assets and any other significant corporate transaction. The interests of these stockholders may not be the same as or may even conflict with your interests. For example, these stockholders could delay or prevent a change of control of our company, even if such a change of control would benefit our other stockholders, which could deprive our stockholders of an opportunity to receive a premium for their common stock as part of a sale of our company or our assets and might affect the prevailing market price of our common stock. The significant concentration of stock ownership may adversely affect the trading price of our common stock due to investors' perception that conflicts of interest may exist or arise.

We are an "emerging growth company" and we cannot be certain if the reduced reporting requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including (i) not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended, or the Sarbanes-Oxley Act, (ii) reduced disclosure obligations regarding executive compensation in our periodic reports, registration statements and proxy statements and (iii) exemptions from the requirements of holding nonbinding advisory stockholder votes on executive compensation and stockholder approval of any golden parachute payments not approved previously.

We could be an emerging growth company for up to five years following the completion of the initial public offering, although circumstances could cause us to lose that status earlier, including if we are deemed to be a "large accelerated filer," which occurs when the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30, or if we have total annual gross revenue of $1.07 billion or more during any fiscal year before that time, in which cases we would no longer be an emerging growth company as of the following December 31, or if we issue more than $1.0 billion in non-convertible debt during any three-year period before that time, in which case we would no longer be an emerging growth company immediately. Even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company," which would allow us to take advantage of many of the same exemptions from disclosure requirements, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our share price may be more volatile.

Under the JOBS Act, emerging growth companies can also delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have elected to take advantage of the benefits of this extended transition period. Our financial statements may therefore not be comparable to those of companies that comply with such new or revised accounting standards. Until the date that we are no longer an "emerging growth company" or affirmatively and irrevocably opt out of the exemption provided by Section 7(a)(2)(B) of the Securities Act, upon issuance of a new or revised accounting standard that applies to our financial statements and that has a different effective date for public and private companies, we will disclose the date on which adoption is required for non-emerging growth companies and the date on which we will adopt the recently issued accounting standard.

Anti-takeover provisions in our charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Our restated certificate of incorporation and our restated bylaws contain provisions that could delay or prevent a change in control of our company. These provisions could also make it difficult for stockholders to elect directors who are not nominated by current members of our board of directors or take other corporate actions, including effecting changes in our management. These provisions:

- establish a classified board of directors so that not all members of our board are elected at one time;
- permit only the board of directors to establish the number of directors and fill vacancies on the board;
- provide that directors may only be removed "for cause" and only with the approval of two-thirds of our stockholders;
- require super-majority voting to amend some provisions in our restated certificate of incorporation and restated bylaws;
- authorize the issuance of "blank check" preferred stock that our board could use to implement a stockholder rights plan;
- eliminate the ability of our stockholders to call special meetings of stockholders;
- prohibit stockholder action by written consent, which requires all stockholder actions to be taken at a meeting of our stockholders;
- prohibit cumulative voting; and
- establish advance notice requirements for nominations for election to our board or for proposing matters that can be acted upon by stockholders at annual stockholder meetings.

In addition, our restated certificate of incorporation, to the fullest extent permitted by law, provides that the Court of Chancery of the State of Delaware is the exclusive forum for: any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty; any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, or the DGCL, our restated certificate of incorporation, or our restated bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. Furthermore, our amended and restated bylaws also provide that unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or any of our directors, officers, or other employees, which may discourage lawsuits with respect to such claims. Alternatively, if a court were to find the choice of forum provisions contained in our restated certificate of incorporation or amended and restated bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business, operating results and financial condition.

In addition, Section 203 of the DGCL may discourage, delay or prevent a change in control of our company. Section 203 imposes certain restrictions on mergers, business combinations and other transactions between us and holders of 15% or more of our common stock.

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

As a public company, and particularly after we are no longer an emerging growth company, we will incur significant legal, accounting and other expenses that we did not incur as a private company. The Sarbanes-Oxley Act, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of the Nasdaq Global Market and other applicable securities rules and regulations impose various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel need to devote a substantial amount of time to these compliance initiatives. Moreover, we expect these rules and regulations to substantially increase our legal and financial compliance costs and to make some activities more time consuming and costly. We cannot predict or estimate the amount or timing of additional costs we may incur to respond to these requirements. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers. Moreover, these rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

We are not currently required to comply with the SEC's rules that implement Section 404 of the Sarbanes-Oxley Act, and are therefore not required to make a formal assessment of the effectiveness of our internal control over financial reporting for that purpose. Pursuant to Section 404, we will be required to furnish a report by our management on our internal control over financial reporting. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude, within the prescribed timeframe or at all, that our internal control over financial reporting is effective as required by Section 404. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements. In addition, if we are not able to continue to meet these requirements, we may not be able to remain listed on the Nasdaq Global Market.

Because we do not anticipate paying any cash dividends on our capital stock in the foreseeable future, capital appreciation, if any, will be your sole source of gain.

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

We may be subject to securities litigation, which is expensive and could divert management attention.

The market price of our common stock may be volatile and, in the past, companies that have experienced volatility in the market price of their stock have been subject to securities class action litigation. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

Item 1B. ***Unresolved Staff Comments***

None

Item 2. ***Properties and Facilities***

Our principal executive office is located in South San Francisco, California, where we lease a total of approximately 52,200 square feet of office and laboratory space in two buildings that we use for our administrative, research and development and other activities. The lease under each of our South San Francisco buildings expires in November 2021, unless we exercise our option to extend each lease term through November 2026. We also have a manufacturing facility and manufacturing-support facility in San Carlos, California, where we lease a total of approximately 29,600 square feet of space in two buildings. The lease on one of our San Carlos buildings expires in July 2021, for which we have two three-year options to extend our lease to July 2027. The lease on the second San Carlos building expires in June 2021, for which we have two three-year options to extend the lease to June 2027.

Item 3. ***Legal Proceedings***

From time to time, we may be involved in legal proceedings arising in the ordinary course of our business. We are not presently a party to any legal proceedings that, in the opinion of management, would have a material adverse effect on our business. Regardless of outcome, litigation can have an adverse impact on us due to defense and settlement costs, diversion of management resources, negative publicity and reputational harm, and other factors.

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 Market under the symbol "STRO" since September 27, 2018. Prior to that there was no public trading market for our common stock.

Holders of Record

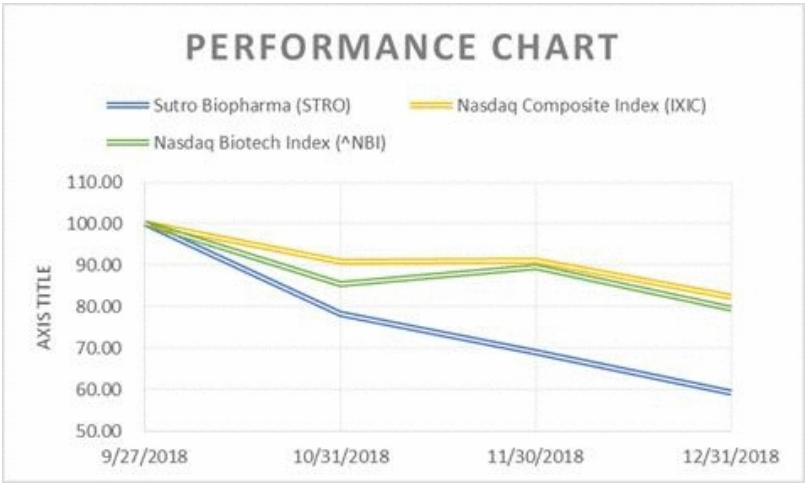
As of March 27, 2019, there were approximately 171 stockholders of record of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Dividend Policy

We currently intend to retain future earnings, if any, for use in operation of our business and to fund future growth. We have never declared or paid any cash dividends on our capital stock and do not anticipate paying any cash dividends in the foreseeable future. Payment of cash dividends, if any, in the future will be at the discretion of our board of directors and will depend on then-existing conditions, including our financial condition, operating results, contractual restrictions, capital requirements, business prospects and other factors our board of directors may deem relevant.

Stock Performance Graph

The following graph shows the total stockholder's return on an investment of $100 in cash at market close on September 27, 2018 (the first day of trading of our common stock), through December 31, 2018 for (i) our common stock, (ii) the Nasdaq Composite Index and (iii) the Nasdaq Biotechnology Index. Pursuant to applicable Securities and Exchange Commission rules, all values assume reinvestment of pre-tax amount of all dividends; however, no dividends have been declared on our common stock to date. The stockholder return shown on the graph below is not necessarily indicative of future performance, and we do not make or endorse any predictions as to future stockholder return. This graph shall not be deemed "soliciting material" or be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934 as amended, or Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act of 1933, as amended, or Securities Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.



Trade Date	Sutro Biopharma (STRO)	Nasdaq Composite Index (IXIC)	Nasdaq Biotech Index (^NBI)
9/27/2018	100.00	100.00	100.00
10/31/2018	78.16	90.85	85.53
11/30/2018	69.01	91.15	89.54
12/31/2018	59.34	82.51	79.47

Securities Authorized for Issuance Under Equity Compensation Plans

The information required by this Item regarding equity compensation plans is incorporated by reference to the information set forth in PART III Item 12 of this Annual Report on Form 10-K.

Unregistered Sales of Equity Securities

From January 1, 2018 through December 31, 2018, we sold and issued the following unregistered securities:

1. Prior to filing our registration statement on Form S-8 in September 2018, we issued and sold to our directors, officers, employees and consultants an aggregate of 18,700 unregistered shares of common stock upon exercise of stock options under our 2004 Stock Plan, or the 2004 Plan at per share exercise prices ranging from $3.99 to $14.88.
2. In July 2018, we issued 319,305,718 shares of Series E redeemable convertible preferred stock that resulted in gross proceeds of $85.4 million.
3. In 2018, we issued an aggregate of 733 shares of common stock at a price of $5.81 per share upon the exercise of common stock warrants by four individuals.
4. In 2018, we issued an aggregate of 559,564 shares of Series C preferred stock at a price of $0.4797 per share upon the exercise of Series C preferred stock warrants, which shares converted into 20,700 shares of common stock in connection with our initial public offering.
5. In October 2018, we issued to Merck 666,666 shares of our common stock at a price per share equal to the initial public offering price of $15.00 per share that resulted in gross proceeds of approximately $10,000,000.

The offers, sales and issuances of the securities described in paragraph (1) above were deemed to be exempt from registration under the Securities Act under Rule 701 promulgated under the Securities Act as offers and sale of securities pursuant to certain compensatory benefit plans and contracts relating to compensation in compliance with Rule 701.

The offers, sales, and issuances of the securities described in paragraphs (2), (3) and (4) above were deemed to be exempt from registration under the Securities Act in reliance on Section 4(a)(2) of the Securities Act. The recipients of securities in each of these transactions acquired the securities for investment only and not with a view to or for sale in connection with any distribution thereof and appropriate legends were affixed to the securities issued in these transactions. Each of the recipients of securities in these transactions was an accredited or sophisticated person and had adequate access, through employment, business or other relationships, to information about us.

Use of Proceeds from Registered Securities

On October 1, 2018, we completed our IPO and sold 5,667,000 shares of common stock at an IPO price of $15.00 per share. The offer and sale of all of the shares in the IPO were registered under the Securities Act pursuant to registration statements on Form S-1 (File Nos. 333-227103 and 333-227548), which was declared effective by the SEC on September 26, 2018. No additional shares were registered.

We received net proceeds from the IPO of approximately $74.4 million, after deducting underwriting discounts and commissions of approximately $6.0 million and estimated offering expenses of approximately $4.6 million. Cowen and Company, LLC and Piper Jaffray & Co. acted as joint book-running managers of the offering and as representatives of the underwriters. None of the expenses associated with the IPO were paid to directors, officers, persons owning 10% or more of any class of equity securities, or to their associates, or to our affiliates.

There has been no material change in the planned use of proceeds from our IPO as described in the Prospectus filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act on September 27, 2018.

Issuer Purchases of Equity Securities

None.

Item 6. ***Selected Financial Data***

The following tables summarize our selected financial data for the periods and as of the dates indicated. We have derived our selected statements of operations data for the years ended December 31, 2018, 2017, and 2016 and the balance sheet data as of December 31, 2018 and 2017 from our audited financial statements included elsewhere in this report. The selected balance sheet data as of December 31, 2016 has been derived 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 the future. You should read the selected financial data below together with the information under "Item 7. 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,		
	2018	2017	2016
	(In thousands, except share and per share amounts)		
Statements of Operations Data:			
Revenue:			
Collaboration revenue (including amounts from related parties of $13,541, $44,606 and $54,001 during the years ended December 31, 2018, 2017 and 2016, respectively)	$ 32,387	$ 51,741	$ 59,731
Other revenue (including amounts from related parties of $5,425 during the year ended December 31, 2018)	6,032	-	-
Total revenue	38,419	51,741	59,731
Operating expenses:			
Research and development	54,262	54,639	43,550
General and administrative	21,380	16,374	14,817
Total operating expenses	75,642	71,013	58,367
(loss) Income from operations	(37,223)	(19,272)	1,364
Interest income	1,616	273	251
Interest expense	(1,623)	(612)	-
Other income (expense), net	1,913	(77)	87
Net (loss) income	$ (35,317)	$ (19,688)	$ 1,702
Net loss per share attributable to common stockholders, basic and diluted (1)	$ (6.13)	$ (43.95)	$ -
Weighted-average shares used in computing net loss per share (1)	5,758,875	447,946	407,735

(1) See Notes 1 and 13 to our audited financial statements included elsewhere in this report for an explanation of the calculations of our basic and diluted net loss per share and the weighted-average number of shares used in computing the per share amounts.

	As of December 31,		
	2018	2017	2016
		(in thousands)	
Balance Sheet Data:			
Cash and cash equivalents	$ 125,298	$ 22,020	$ 11,593
Marketable securities	79,194	-	35,928
Working capital (deficit) (1)	173,523	(6,327)	(493)
Total assets	223,139	40,769	69,277
Debt	14,724	14,563	-
Redeemable convertible preferred stock warrant liability	-	1,708	1,193
Redeemable convertible preferred stock	-	102,505	102,505
Accumulated deficit	(150,328)	(115,011)	(95,323)
Total stockholders' equity (deficit)	131,539	(109,001)	(90,901)

(1) We define working capital as current assets less current liabilities. See our financial statements for further details regarding our current assets and current liabilities.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion should be read in conjunction with the attached financial statements and notes thereto. This Annual Report on Form 10-K, including the following sections, contains forward-looking statements within the meaning of the federal securities laws. These statements are subject to risks and uncertainties that could cause actual results and events to differ materially from those expressed or implied by such forward-looking statements. For a detailed discussion of these risks and uncertainties, see the "Risk Factors" section in Item 1A of this Annual Report on Form 10-K. We caution the reader not to place undue reliance on these forward-looking statements, which reflect management's analysis only as of the date of this Form 10-K. We undertake no obligation to update forward-looking statements, which reflect events or circumstances occurring after the date of this Form 10-K.

Overview

We are a clinical stage drug discovery, development and manufacturing company focused on deploying our proprietary integrated cell-free protein synthesis and site-specific conjugation platform, XpressCF™, to create a broad variety of optimally designed, next-generation protein therapeutics initially for cancer and autoimmune disorders. We aim to design therapeutics using the most relevant and potent modalities, including cytokine-based targets, immuno-oncology, or I/O, agents, antibody-drug conjugates, or ADCs, and bispecific antibodies that are directed primarily against clinically validated targets where the current standard of care is suboptimal. We believe our platform allows us to accelerate the discovery and development of potential first-in-class and best-in-class molecules by enabling the rapid and systematic evaluation of protein structure-activity relationships to create optimized homogeneous product candidates. Our mission is to transform the lives of patients by using our XpressCF™ Platform to create medicines with improved therapeutic profiles for areas of unmet need.

Once identified, production of protein drug candidates can be rapidly and predictably scaled in our current Good Manufacturing Practices compliant manufacturing facility. We have the ability to manufacture our cell-free extract that supports our production of proteins on a large scale using a semi-continuous fermentation process. Our two most advanced product candidates are wholly owned: STRO-001, an ADC directed against CD74, for patients with multiple myeloma and non-Hodgkin lymphoma, or NHL, and STRO-002, an ADC directed against folate receptor-alpha, or FolRα, for patients with ovarian and endometrial cancers. STRO-001 is currently enrolling patients in a Phase 1 trial, with initial safety data expected in mid-2019 and initial efficacy data expected by year end 2019. In October 2018, we were granted Orphan Drug Designation by the U.S. Food and Drug Administration ("FDA"), for STRO-001 for the treatment of multiple myeloma. We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019, with initial safety data expected by year end 2019. We have also entered into multi-target, product-focused collaborations with leaders in the field of oncology, including a cytokine derivatives collaboration with Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, USA, or Merck, a B Cell Maturation Antigen, or BCMA, and an immuno-oncology directed alliance with Celgene Corporation, or Celgene, and an oncology-focused collaboration with Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name "EMD Serono").

Since the commencement of our operations, we have devoted substantially all of our resources to performing research and development and manufacturing activities in support of our own product development efforts and those of our collaborators, raising capital to support and expand such activities and providing general and administrative support for these operations. We have funded our operations to date primarily from upfront, milestone and other payments under our collaboration agreements with Merck, Celgene and EMD Serono, the issuance and sale of redeemable convertible preferred stock, our initial public offering, or IPO, of common stock and debt proceeds.

On September 26, 2018, our registration statements on Form S-1 (File Nos. 333-227103 and 333-227548) relating to our IPO, were declared effective by the Securities and Exchange Commission, or SEC, and shares of our common stock began trading on the Nasdaq Global Market on September 27, 2018. Upon the closing of the IPO on October 1, 2018, we issued and sold an aggregate of 5,667,000 shares of common stock at a price of $15.00 per share for gross proceeds of approximately $85.0 million. We received net proceeds from the IPO of approximately $74.4 million, after underwriting discounts, commissions and offering expenses. In addition to the shares of common stock sold in the IPO, we concurrently sold in a private placement to Merck, 666,666 shares of common stock at the IPO offering price of $15.00 per share, for proceeds of approximately $10.0 million.

We have no products approved for commercial sale and have not generated any revenue from commercial product sales. We had a net loss of $35.3 million and $19.7 million for the years ended December 31, 2018 and 2017, respectively. Although we had net income for the year ended December 31, 2016 of $1.7 million, we cannot assure you that we will ever have net income again or that we will generate positive cash flow from operating activities. As of December 31, 2018, we had an accumulated deficit of $150.3 million. We do not expect to generate any revenue from commercial product sales unless and until we successfully complete development and obtain regulatory approval for one or more of our product candidates, which we expect will take a number of years. If we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. We expect our operating expenses to significantly increase as we continue to develop, and seek regulatory approvals for, our product candidates, engage in other research and development activities, expand our pipeline of product candidates, continue to develop our manufacturing facility and capabilities, maintain and expand our intellectual property portfolio, seek regulatory and marketing approval for any product candidates that we may develop, acquire or in-license other assets or technologies, ultimately establish a sales, marketing and distribution infrastructure to commercialize any products for which we may obtain marketing approval and operate as a public company. Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our clinical trials, our expenditures on other research and development activities and the timing of achievement and receipt of upfront, milestones and other collaboration agreement payments.

Recent Developments

In October 2018, the FDA granted orphan drug designation for STRO-001, for the treatment of multiple myeloma. The FDA's Orphan Drug Designation Program provides orphan status to drugs and biologics, which are defined as those intended for the safe and effective treatment, diagnosis or prevention of rare diseases/disorders that affect fewer than 200,000 people in the United States, or that affect more than 200,000 persons but are not expected to recover the costs of developing and marketing a treatment drug.

We began enrolling patients in a STRO-002 Phase 1 trial focused on ovarian and endometrial cancers in March 2019.

In December 2018, we earned a $10.0 million milestone payment from Celgene triggered by the successful development of a dry powder XtractCF™ formulation, using spray drying technology, which has been in general use for many years in the pharmaceutical industry.

Financial Operations Overview

Total Revenue

We have no products approved for commercial sale and have not generated any revenue from commercial product sales. Our total revenue to date has been generated principally from our collaboration and license agreements with Celgene, Merck and EMD Serono, and to a lesser extent, from manufacturing, supply and services and products we provide to Celgene and SutroVax, Inc., or SutroVax.

Collaboration Revenue

Collaboration revenue consists of revenue received from upfront, milestone and contingent payments received from our collaborators. We recognize revenue from nonrefundable upfront license payments over the term of our estimated period of performance under the agreements. In addition to receiving upfront payments, we may also be entitled to milestone and other contingent payments upon achieving predefined objectives. Revenue from milestones, if they are nonrefundable and deemed substantive, are recognized upon successful accomplishment of the performance obligations. To the extent that non-substantive milestones are achieved, and we have remaining performance obligations, such payments are deferred and recognized as revenue over the estimated remaining period of performance.

We expect that any collaboration revenue we generate principally from our current collaboration and license agreements with Celgene, Merck and EMD Serono, and from any future collaboration partners, will fluctuate in the future as a result of the timing and amount of upfront, milestones and other collaboration agreement payments. We began recognizing revenue under the 2018 Merck Agreement in the third quarter of 2018.

Other Revenue

Other revenue consists of revenue received from development, manufacturing and supply chain management services, including clinical product supply, that we provide to Celgene and from extracts and custom reagents that we provide to SutroVax. We recognize revenue when the services or products are provided. We expect other revenue will fluctuate from period to period as a result of the timing of ordering and providing such services and products.

Operating Expenses

Research and Development

Research and development expenses represent costs incurred in performing research, development and manufacturing activities in support of our own product development efforts and those of our collaborators, and include salaries, employee benefits, stock-based compensation, laboratory supplies, outsourced research and development expenses, professional services and allocated facilities-related costs. We expense both internal and external research and development costs as they are incurred. Non-refundable advance payments for services that will be used or rendered for future research and development activities are recorded as prepaid expenses and recognized as expenses as the related services are performed.

We expect our research and development expenses to increase in the future as we advance our product candidates into and through preclinical studies and clinical trials, pursue regulatory approval of our product candidates, expand our pipeline of product candidates and continue to develop our manufacturing facility and capabilities. The process of conducting the necessary preclinical and clinical research to obtain regulatory approval is costly and time consuming. The actual probability of success for our product candidates may be affected by a variety of factors including: the safety and efficacy of our product candidates, early clinical data, investment in our clinical programs, the ability of collaborators to successfully develop our licensed product candidates, competition, manufacturing capability and commercial viability. We may never succeed in achieving regulatory approval for any of our product candidates. 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 product candidates.

The following table summarizes our research and development expenses incurred during the periods indicated. The internal costs include personnel, facility costs and research and scientific related activities associated with our pipeline. The external program costs reflect external costs attributable to our clinical development candidates and preclinical candidates selected for further development. Such expenses include third-party costs for preclinical and clinical studies and research services, and other consulting costs.

	Year Ended December 31,		
	2018	2017	2016
Internal costs:			
Research and drug discovery	15,541	15,636	17,040
Process and product development	8,537	8,195	8,224
Manufacturing	16,872	19,769	14,496
Clinical development	1,357	843	-
Total internal costs	42,307	44,443	39,760
External Program Costs:			
Research and drug discovery	1,001	1,090	1,650
Toxicology and translational science	2,239	3,767	138
Process and product development	1,080	208	158
Manufacturing	4,530	4,198	1,844
Clinical development	3,105	933	-
Total external program costs	11,955	10,196	3,790
Total research and development expenses	$ 54,262	$ 54,639	$ 43,550

General and Administrative

Our general and administrative expenses consist primarily of personnel costs, expenses for outside professional services, including legal, human resource, audit, accounting and tax services and allocated facilities-related costs. Personnel costs include salaries, employee benefits and stock-based compensation. We expect to incur additional expenses operating as a public company, including expenses related to compliance with the rules and regulations of the SEC and listing standards applicable to companies listed on the Nasdaq Global Market, additional insurance expenses, investor relations activities and other administrative and professional services. We also expect to increase the size of our administrative function to support the anticipated growth of our business.

Interest Income

Interest income consists primarily of interest received on our invested funds.

Interest Expense

Interest expense includes interest incurred on our debt and amortization of debt issuance costs.

Other Income (Expense), Net

Other income (expense), net primarily includes gains and losses from the remeasurement of our liabilities related to our redeemable convertible preferred stock warrants. We adjusted the liability for changes in estimated fair value until the earlier of the exercise of the warrants, expiration of the warrants, or conversion of the redeemable convertible preferred stock warrants upon the completion of our IPO, into common stock warrants. With the completion of our IPO on October 1, 2018, the redeemable convertible preferred stock warrant liability was reclassified to additional paid-in-capital and we will no longer record any related periodic fair value adjustments.

Comparison of the Years Ended December 31, 2018 and 2017

	Year ended December 31,		Change	
	2018	2017	$	%
	(in thousands)			
Revenue:				
Collaboration revenue (including amounts from related parties of $13,541 and $44,606 during the years ended December 31, 2018 and 2017, respectively)	$ 32,387	$ 51,741	$ (19,354)	(37)%
Other revenue (including amounts from related parties of $5,425 during the year ended December 31, 2018)	6,032	-	6,032	*
Total revenue	38,419	51,741	(13,322)	(26)%
Operating expenses:				
Research and development	54,262	54,639	(377)	(1)%
General administrative	21,380	16,374	5,006	31%
Total operating expenses	75,642	71,013	4,629	7%
Loss from operations	(37,223)	(19,272)	(17,951)	93%
Interest income	1,616	273	1,343	*
Interest expense	(1,623)	(612)	(1,011)	165%
Other income (expense), net	1,913	(77)	1,990	*
Net loss	$ (35,317)	$ (19,688)	$ (15,629)	79%

* Percentage not meaningful

Revenue

We have recognized revenue as follows during the periods indicated:

	Year Ended December 31,		Change	
	2018	2017	$	%
	(in thousands)			
Collaboration revenue:				
Celgene Corporation ("Celgene") (1)				
Recognition of up-front payments	$ 6,567	$ 16,694	$ (10,127)	(61)%
Research and development services	119	660	(541)	(82)%
Milestones and contingent payments	10,000	27,252	(17,252)	(63)%
Total	16,686	44,606	(27,920)	(63)%
Merck Sharp & Dohme Corporation ("Merck")—related party:				
Recognition of up-front payments	6,985	-	6,985	*
Research and development services	1,541	-	1,541	*
Total	8,526	-	8,526	*
Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name "EMD Serono"):				
Recognition of up-front payments	4,142	4,120	22	1%
Research and development services	3,033	3,015	18	1%
Total	7,175	7,135	40	1%
Total collaboration revenue	$ 32,387	$ 51,741	$ (19,354)	(37)%
Other revenue				
Celgene Corporation (1):				
Development and manufacturing services and clinical product supply	$ 4,501	$ -	$ 4,501	*
SutroVax—related party:				
Supply and other	1,531	-	1,531	*
Total other revenue	$ 6,032	$ -	$ 6,032	*
Total revenue	$ 38,419	$ 51,741	$ (13,322)	(26)%

(1) Includes $5.0 million of collaboration revenue and $3.9 million of other revenue from Celgene as related party revenue. Celgene was a related party through September 30, 2018 as it held more than 10% of our common stock for the periods presented until the closing of our IPO.

* Percentage not meaningful

Total revenue decreased by $13.2 million, or 26%, during year ended December 31, 2018 compared to the year ended December 31, 2017, due to the decline in collaboration revenue of $19.4 million, offset partially by a $6.0 million increase in other revenue-related parties.

The decline in collaboration revenue was due primarily to a net decrease of $27.9 million in revenues related to lower revenue from the 2017 Celgene Agreement as compared to revenue earned under the 2014 Celgene Agreement. The up-front payment under the 2017 Celgene Agreement, together with the remaining deferred revenue balance of the 2014 Celgene Agreement, are being recognized ratably, commencing in August 2017 and estimated to be completed in September 2020. The decline was partially offset by a $8.5 million increase in research and development services provided to Merck and the recognition of collaboration revenue from the up-front nonrefundable payment of $60.0 million received in 2018. Under the 2018 Merck Agreement, the upfront fee is being recognized as revenue on a proportion of performance basis, using full-time equivalents (FTEs) as the basis of measurement.

Other revenue in 2018 was due primarily to development and clinical manufacturing services and supplies provided to Celgene for $4.5 million and supplies and other revenue related to SutroVax for $1.5 million. There were no such services during the year ended December 31, 2017.

Research and Development Expense

Research and development expense remained flat during the year ended December 31, 2018 compared to the year ended December 31, 2017. Lower overall spending on manufacturing materials of $3.4 million, a $2.7 million impairment cost taken in 2017, and the $0.7 million inclusion of personnel-related costs previously in research and development expense, were offset by a $2.9 million increase in compensation-related expenses due to higher headcount, a $2.2 million increase in external services attributable to clinical trial costs related to STRO-001 and STRO-002, and a $1.4 million increase in consulting services related to supply chain management.

General and Administrative Expense

General and administrative expense increased by $5.0 million, or 31%, during the year ended December 31, 2018 compared to the year ended December 31, 2017. The increase was due primarily to increases of $2.6 million in personnel-related expenses, $1.0 million in legal, insurance and audit fees, a $0.4 million fee related to the Merck transaction, $0.2 million of fees paid to a third party in relation to the Celgene milestone payment, and $0.7 million from the inclusion of personnel-related costs previously in research and development expense effective in January 2018.

Interest Income

Interest income increased by $1.3 million during the year ended December 31, 2018 compared to the year ended December 31, 2017, due primarily to a higher cash balance resulting from the proceeds from the May 2018 and July 2018 closings of the Series E financing, the up-front payment of $60.0 million received under the 2018 Merck Agreement, and the combined net proceeds of $84.4 million from the completion of our IPO and the concurrent private placement of common stock to Merck.

Interest Expense

Interest expense increased by $1.0 million during the year ended December 31, 2018 compared to the year ended December 31, 2017, due to interest incurred under a loan and security agreement that we entered into with Oxford and SVB in August 2017.

Other Income (Expense), Net

Other income (expense), net changed by $2.0 million during the year ended December 31, 2018 compared to the year ended December 31, 2017. The change was primarily due to a $1.0 million increase in the estimated fair value and conversion of our redeemable convertible preferred stock warrants during the year ended December 31, 2018 upon the completion of our initial public offering, and a $0.9 million increase in connection with the associated income attributable to the arrangement with the Leukemia & Lymphoma Society, Inc.

Comparison of the Years Ended December 31, 2017 and 2016

	Year ended December 31,		Change	
	2017	2016	$	%
	(in thousands)			
Revenue:				
Collaboration revenue	$ 51,741	$ 59,731	$ (7,990)	(13)%
Total revenue	51,741	59,731	(7,990)	(13)%
Operating expenses:				
Research and development	54,639	43,550	11,089	25%
General administrative	16,374	14,817	1,557	11%
Total operating expenses	71,013	58,367	12,646	22%
(Loss) Income from operations	(19,272)	1,364	(20,636)	*
Interest income	273	251	22	9%
Interest expense	(612)	-	(612)	*
Other (expense) income, net	(77)	87	(164)	*
Net (loss) income	$ (19,688)	$ 1,702	$ (21,390)	*

* Percentage not meaningful

Collaboration Revenue

We have recognized revenue from our collaboration agreements as follows during the periods indicated:

	Year Ended December 31,		Change	
	2017	2016	$	%
	(in thousands)			
Collaboration revenue:				
Celgene Corporation ("Celgene")—related party:				
Recognition of up-front payments	$ 16,694	$ 27,730	$ (11,036)	(40)%
Research and development services	660	-	660	*
Milestones and contingent payments	27,252	26,271	981	4%
Total	44,606	54,001	(9,395)	(17)%
Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name "EMD Serono"):				
Recognition of up-front payments	4,120	4,120	-	0%
Research and development services	3,015	1,610	1,405	87%
Total	7,135	5,730	1,405	25%
Total collaboration revenue	$ 51,741	$ 59,731	$ (7,990)	(13)%
Total revenue	$ 51,741	$ 59,731	$ (7,990)	(13)%

* Percentage not meaningful

Revenue decreased by $8.0 million, or 13%, during the year ended December 31, 2017 compared to the year ended December 31, 2016. The decrease was due to the decline in collaboration revenue of $11.0 million recognized from the up-front nonrefundable payment of $83.1 million received in 2014 under the 2014 Celgene Agreement, as the remaining deferred revenue balance, as of the effective date of the 2017 Celgene Agreement, along with the payments under the 2017 Celgene Agreement, are being recognized ratably starting in August 2017 and ending in September 2020. The decrease was partially offset by a $1.0 million increase in revenue recognized from milestones and contingent payments from Celgene and an increase of an aggregate of $2.1 million in research and development services for Celgene and EMD Serono.

Research and Development Expense

Research and development expense increased by $11.1 million, or 25%, during the year ended December 31, 2017 compared to the year ended December 31, 2016. The increase was due to an increase of $3.4 million in personnel-related expenses due to headcount growth, an increase of $2.4 million in consulting and other external services, an increase of $1.7 million in facilities-related costs, as a result of increased research and development activities in support of our own product development efforts and those of our collaborators, and a net increase of $0.9 million in preclinical and pharmacology research spending as well as manufacturing supplies and production materials. The increase in research and development expense also reflects an impairment charge of $2.7 million pertaining to certain custom-built manufacturing equipment that failed to meet our acceptance criteria.

General and Administrative Expense

General and administrative expense increased by $1.6 million, or 11%, during the year ended December 31, 2017 compared to the year ended December 31, 2016. The increase was due to an increase of $0.5 million in equipment-related expenses and an increase of $0.7 million in personnel-related expenses due to higher headcount. In addition, we incurred an additional $0.4 million related to external investor relations services and professional services fees.

Interest Expense

Interest expense increased by $0.6 million during the year ended December 31, 2017 compared to the year ended December 31, 2016. The increase was due to the interest incurred under a loan and security agreement that we entered into in August 2017. We had no outstanding debt in 2016.

Other Income (Expense), Net

Other income (expense), net changed by $0.2 million during the year ended December 31, 2017 compared to the year ended December 31, 2016. The change was primarily due to the change in estimated fair value of our Series B and Series C redeemable convertible preferred stock warrants.

Liquidity and Capital Resources

Sources of Liquidity

To date, we have incurred significant net losses, except for 2016, and negative cash flows from operations. Our operations have been funded primarily by payments received from our collaborators, and net proceeds from equity sales and debt. As of December 31, 2018, we had $204.5 million in cash, cash equivalents and marketable securities, and outstanding debt of $14.7 million, which is net of $0.3 million in unamortized debt discount, and an accumulated deficit of $150.3 million.

Funding Requirements

Based upon our current operating plan, we believe that our existing capital resources will enable us to fund our operating expenses and capital expenditure requirements through at least the next twelve months after the date of this filing. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. We will continue to require additional financing to advance our current product candidates into and through clinical development, to develop, acquire or in-license other potential product candidates, pay our obligations and to fund operations for the foreseeable future.

We may seek to raise any necessary additional capital through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements, marketing and distribution arrangements, or other sources of financing. Adequate additional funding may not be available to us on acceptable terms, or at all. Any failure to raise capital as and when needed could have a negative impact on our financial condition and on our ability to pursue our business plans and strategies, and may cause us to delay, reduce the scope of or suspend one or more of our pre-clinical and clinical studies, research and development programs or commercialization efforts, and may necessitate us to delay, reduce or terminate planned activities in order to reduce costs. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates and the extent to which we may enter into additional collaborations with third parties to participate in their development and commercialization, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical studies.

To the extent we raise additional capital through new collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our product candidates, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we do raise additional capital through public or private equity or convertible debt offerings, the ownership interest of our existing stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. If we raise additional capital through debt financing, we may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

Cash Flows

The following table summarizes our cash flows during the periods indicated:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Cash provided by (used in) operating activities	$ 12,683	$ (37,073)	$ (13,153)
Cash (used in) provided by investing activities	(80,190)	32,602	9,591
Cash provided by financing activities	170,785	14,638	177
Increase in cash and cash equivalents	$ 103,278	$ 10,167	$ (3,385)

Cash Flows from Operating Activities

Cash provided by operating activities for the year ended December 31, 2018 was $12.7 million. Our net loss of $35.3 million was decreased by non-cash charges of $4.5 million for depreciation and amortization and $2.9 million for stock-based compensation, which were offset partially by the gain of $1.0 million for the change in fair value of our redeemable convertible preferred stock warrant liability and a $0.9 million reduction of the liability attributable to the arrangement with the Leukemia & Lymphoma Society, Inc. Cash provided in operating activities reflected a net increase in operating assets and liabilities of $42.6 million, primarily due to an increase in our deferred revenue balance of $60.0 million from the upfront payment related to the 2018 Merck Agreement, net of $17.7 million recognized in revenue under our collaboration agreements during prior periods, an increase in $0.6 million in other liabilities, of which $0.4 million was contributions received from participants of our employee stock purchase plan and $0.2 million was due to an increase in interest expense related to our loan with Oxford/SVB, an increase in accounts payable of $0.2 million due to timing of payments, and an increase of $2.6 million in accrued bonus compensation due to increased headcount and certain goal achievements. This was offset partially by an increase in accounts receivable of $0.9 million due to higher research and development services revenues from our collaborators, and an increase in $2.2 million in prepaid expenses and other current assets due to payments made to contract research organizations mainly related to STRO-001.

Cash used in operating activities for the year ended December 31, 2017 was $37.1 million. Our net loss of $19.7 million was decreased by non-cash charges of $5.0 million for depreciation and amortization, $2.7 million for an impairment charge on certain equipment, $1.4 million for stock-based compensation and $0.4 million in other non-cash charges. Cash used in operating activities reflected a change in net operating assets of $26.9 million, primarily due to a decrease in our deferred revenue balance of $25.6 million from the recognition of revenue pertaining to payments received from our collaborators Celgene and EMD Serono during prior periods, and an increase in accounts receivable of $1.0 million due to higher research and development services revenues from our collaborators Celgene and EMD Serono.

Cash used in operating activities for the year ended December 31, 2016 was $13.2 million. Our net income of $1.7 million was increased by non-cash charges of $5.7 million for depreciation and amortization, $1.0 million for stock-based compensation and $0.2 million for amortization of premium on marketable securities. Cash used in operating activities reflected a decrease in net operating assets of $21.7 million, primarily due to a decrease in our deferred revenue balance of $23.1 million from the recognition of revenue pertaining to payments received from our collaborators Celgene and EMD Serono during prior periods, an increase in accrued bonus compensation of $1.2 million driven primarily by higher headcount and an increase of $0.9 million in accounts payable due to a higher level of research and development activities.

Cash Flows from Investing Activities

Cash used in investing activities of $80.2 million for the year ended December 31, 2018 was related to purchases of marketable securities of $81.5 million and purchases of property and equipment of $1.6 million, principally for laboratory and manufacturing equipment, offset partially by maturities of marketable securities of $2.8 million.

Cash provided by investing activities of $32.6 million for the year ended December 31, 2017 was related to proceeds from maturities of marketable securities of $34.9 million and sales of marketable securities of $15.2 million, partially offset by purchases of marketable securities of $14.2 million and purchases of property and equipment of $3.3 million, principally for laboratory and manufacturing equipment and leasehold improvements.

Cash provided by investing activities of $9.6 million for the year ended December 31, 2016 was related to proceeds from maturities of marketable securities of $57.8 million and sales of marketable securities of $8.5 million, partially offset by purchases of marketable securities of $52.3 million and purchases of property and equipment of $4.4 million, principally for laboratory and manufacturing equipment and leasehold improvements.

Cash Flows from Financing Activities

Cash provided by financing activities of $170.8 million for the year ended December 31, 2018 was primarily related to the proceeds from our sale of Series E redeemable convertible preferred stock, net of issuance costs, of $84.7 million, proceeds of $84.4 million from the issuance of common stock upon our IPO, net of issuance costs, and the concurrent private placement of common stock to Merck, proceeds of $0.4 million related to the exercise of common stock options and preferred stock warrants, proceeds of $1.0 million in connection with a research, development and commercialization agreement, and proceeds of $0.2 million from the payment of a note receivable from a stockholder.

Cash provided by financing activities of $14.6 million for the year ended December 31, 2017 was primarily related to the proceeds from our debt with Oxford and SVB, net of issuance costs, of $14.8 million, partially offset by the payment of $0.3 million in financing costs related to the IPO.

Cash provided by financing activities of $0.2 million for the year ended December 31, 2016 was related to proceeds from the issuances of common stock from the exercise of stock options.

Contractual Obligations and Other Commitments

The following table summarizes our contractual obligations as of December 31, 2018:

	Payments Due by Period				
	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years	Total
	(in thousands)				
Contractual obligations:					
Debt, principal (1)	$ 5,000	$ 10,000	$ -	$ -	$ 15,000
Debt, interest (2)	983	1,189	-	-	2,172
Operating lease obligations	3,655	6,966	-	-	10,621
Total contractual obligations	$ 9,638	$ 18,155	$ -	$ -	$ 27,793

(1) Represents principal payments only. We will pay interest on outstanding indebtedness based on the rates and terms summarized in Note 7 to our audited financial statements included elsewhere in this filing.

(2) Represents interest expense expected to be incurred on our debt based on obligations outstanding and rates effective at December 31, 2018, including a final one-time payment of $0.6 million.

In addition, we enter into agreements in the normal course of business with contract research organizations for clinical trials and with vendors for preclinical studies and other services and products for operating purposes, which are generally cancelable upon written notice. These payments are not included in this table of contractual obligations.

Off-Balance Sheet Arrangements

We have not entered into any off-balance sheet arrangements, as defined under SEC rules. While we have an investment classified as variable interest entity, its purpose is not to provide off-balance sheet financing.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with United States generally accepted accounting principles. 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 revenue generated and expenses incurred during the reporting periods. 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. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in the notes to our financial statements included elsewhere in this filing, we believe that the following critical accounting policies are most important to understanding and evaluating our reported financial results.

Revenue Recognition

We generate revenue from collaboration and license agreements for the development and commercialization of our product candidates. Under our collaboration agreements, we may receive non-refundable upfront payments, funding for research and development services, milestones, other contingent payments and royalties. In assessing the appropriate revenue recognition related to a collaboration agreement, we first determine whether an arrangement includes multiple elements, such as the delivery of intellectual property rights and research and development services.

For revenue agreements with multiple-elements, we identify the deliverables included within the agreement and evaluate which deliverables may represent separate units of accounting, based on the achievement of certain criteria, including whether the deliverable has stand-alone value to the collaborator. Upfront payments received in connection with licenses to our technology rights are deferred if facts and circumstances dictate that the license does not have stand-alone value, and are recognized as license revenue over the estimated period of performance that is generally consistent with the terms of the research and development obligations contained in the specific collaboration and license agreement. We periodically review our estimated periods of performance based on the progress under each arrangement and account for the impact of any changes in estimated periods of performance on a prospective basis. Typically, access to the intellectual property rights under our collaboration agreements do not have stand-alone value from the other elements within the arrangement. As such, upfront payments are recorded as deferred revenue in the balance sheet and are recognized as collaboration revenue over the estimated period of performance that is consistent with the terms of the research and development obligations contained in the collaboration, or on a proportion of performance basis.

Revenue is recognized when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable and collectability is reasonably assured. For multiple-element arrangements, each deliverable within a multiple-deliverable revenue arrangement is accounted for as a separate unit of accounting if both of the following criteria are met: (i) the delivered item or items has value to the customer on a stand-alone basis and (ii) for an arrangement that includes a general right of return relative to the delivered item, delivery or performance of the undelivered item is considered probable and substantially in management's control.

We recognize revenue from milestone payments when: (i) the milestone event is substantive and its achievability has substantive uncertainty at the inception of the agreement and (ii) we have completed our performance obligations related to the achievement of the milestone. Milestone payments are considered substantive if all of the following conditions are met: the milestone payment (a) is commensurate with either our performance subsequent to the inception of the arrangement to achieve the milestone or the enhancement of the value of the delivered item or items as a result of a specific outcome resulting from our performance subsequent to the inception of the arrangement to achieve the milestone, (b) relates solely to past performance and (c) is reasonable relative to all of the deliverables and payment terms (including other potential milestone consideration) within the arrangement.

Determining whether and when these revenue recognition criteria have been satisfied often involves assumptions and judgments that can have a significant impact on the timing and amount of reported revenue. Changes in assumptions or judgments or changes to the elements in an arrangement could cause a material increase or decrease in the amount of revenue that is reported in a particular period.

Under certain collaborative arrangements, we are entitled to payments for certain research and development activities, including providing product and other related materials. Our policy is to account for such payments by our collaboration partners as collaboration revenue.

In May 2014, the FASB issued ASU No. 2014-09 (Topic 606), Revenue from Contracts with Customers. In August 2015, the FASB issued ASU No. 2015-14 (Topic 606), Revenue from Contracts with Customers: Deferral of the Effective Date, which delayed the effective date of ASU 2014-09 by one year. The core principle of ASU 2014-09 is that an entity should recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. ASU 2014-09 defines a five-step process to achieve this core principle and, in doing so, it is possible more judgment and estimates may be required within the revenue recognition process than required under existing U.S. generally accepted accounting pronouncements. We continue to assess the impact of the new revenue standard on our financial statements. We will adopt the new standard and its related amendments effective January 1, 2019 using the modified retrospective method.

Research and Development

We record accrued expenses for estimated costs of our research and development activities conducted by third party service providers, which include outsourced research and development expenses, professional services and contract manufacturing activities. We record the estimated costs of research and development activities based upon the estimated amount of services provided but not yet invoiced, and include these costs in current liabilities in the balance sheets and within research and development expense in the statements of operations.

Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and capitalized and recognized as an expense as the goods are delivered or the related services are performed.

For outsourced research and development expenses, such as professional fees payable to third parties for preclinical studies, clinical trials and research services and other consulting costs, we estimate the expenses based on the services performed, pursuant to contracts with research institutions that conduct and manage preclinical studies, clinical trials and research services on our behalf. We estimate these expenses based on discussions with internal management personnel and external service providers as to the progress or stage of completion of services and the contracted fees to be paid for such services. If the actual timing of the performance of services or the level of effort varies from the original estimates, we will adjust the accrual accordingly. Payments made to third parties under these arrangements in advance of the performance of the related services by the third parties are recorded as prepaid expenses until the services are rendered.

Stock-Based Compensation

We recognize compensation costs related to stock options granted to employees based on the estimated fair value of the awards on the date of grant, net of estimated forfeitures. 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 stock-based awards is generally recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards.

The Black-Scholes option-pricing model requires the use of highly subjective assumptions to determine the fair value of stock-based awards, including the expected term and the price volatility of the underlying stock. These assumptions include:

- *Expected term*—The expected term represents the period that the stock-based awards are expected to be outstanding. We use the "simplified" method to determine the expected life of options granted, which calculates the expected term as the average of the weighted-average vesting term and the contractual term of the option.
- *Expected* volatility—Since we have limited information available on the volatility of our common stock due to its short trading history, 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. 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 options.
- *Expected dividend*—We have never paid dividends on our common stock and have no plans to pay dividends on our common stock. Therefore, we use an expected dividend yield of zero.

In addition to the assumptions used in the Black-Scholes option-pricing model, we must also estimate a forfeiture rate to calculate the stock-based compensation for our awards. We will continue to use judgment in evaluating the expected volatility, expected terms and forfeiture rates utilized for our stock-based compensation calculations on a prospective basis.

Historically, for all periods prior to our IPO, the fair value of the shares of common stock underlying our share-based awards was estimated on each grant date by our board of directors. In order to determine the fair value of our common stock underlying option grants, given the absence of a public trading market for our common stock, our board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of our common stock, including timely valuations of our common stock prepared by an independent third-party valuation firm in accordance with the guidance provided by the American Institute of Certified Public Accountants Practice Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*, important developments in our operations, our stage of development, sales of our redeemable convertible preferred stock, actual operating results and financial performance, the conditions in the biotechnology industry and the economy in general, the stock price performance and volatility of comparable public companies, the lack of liquidity of our common stock, and the likelihood of achieving a liquidity event, such as an initial public offering or sale.

For each of the valuation dates during the years ended December 31, 2017 and 2016, we applied the Guideline Publicly Traded Company Analysis (Life Science Expected Compound Method) for the valuation of our equity. We were at an early stage of development and future liquidity events were difficult to forecast. We therefore used the option-pricing method, or OPM, to determine the estimated fair value of our common stock. In an OPM framework, shares are valued by creating a series of call options with exercise prices based on the liquidation preferences and conversion terms of each equity class. The estimated fair values of the preferred and common stock are inferred by analyzing these options. For the valuation dates during the nine months ended September 30, 2018, the equity value was allocated using the OPM and the Probability Weighted Expected Return Method, or PWERM, or the hybrid method. The hybrid method applied the PWERM utilizing the probability of going public and the OPM was utilized in the remaining private scenario. The hybrid method was used commencing May 31, 2018 because of a near-term potential IPO scenario, which also factored in the inherent uncertainty associated with being able to complete an IPO.

For stock options granted after the completion of the IPO, the closing sale price per share of our common stock as reported on the Nasdaq Global Market on the date of grant is used to determine the exercise price per share of our share-based awards to purchase common stock.

Redeemable Convertible Preferred Stock Warrants

In the past, we have issued freestanding warrants to purchase shares of redeemable convertible preferred stock. We accounted for these warrants as a liability in our financial statements and they were recorded at their estimated fair value, because the warrants may have conditionally obligated us to transfer assets at some point in the future due to redemption provisions that were outside our control.

The fair value of the warrants at the issuance date, at September 30, 2018 (immediately prior to our IPO) and December 31, 2017 was determined using the OPM. The warrants were re-measured at each financial reporting period with any changes in fair value being recognized in other income (expense), net in the statement of operations. We continued to adjust the liability for changes in fair value until the earlier of the expiration of the warrants, exercise of the warrants, or conversion of the redeemable convertible preferred stock warrants into common stock warrants upon the completion of a liquidation event, including the completion of an IPO, which occurred on October 1, 2018. Beginning in the fourth quarter of 2018, there was no longer any warrant-related liability.

Income Taxes

As of December 31, 2018, we had federal net operating loss, or NOL, carryforwards of $114.0 million and federal general business credits from research and development expenses totaling $10.9 million, as well as state NOL carryforwards of $73.4 million and state research and development credits of $9.5 million. If not utilized, the federal NOL carryforwards will expire at various dates beginning in 2032, and the federal credits will expire at various dates beginning in 2023. The state NOL carryforwards will expire at various dates beginning in 2030, if not utilized. The state research and development tax credits can be carried forward indefinitely.

Utilization of the net operating loss carryforwards may be subject to a substantial annual limitation due to the ownership change limitations provided by the Tax Reform Act of 1986, or the Tax Reform Act, as amended, and similar state provisions. The annual limitation may result in the expiration of NOLs and credits before utilization. We have performed a Section 382 study for the period of June 16, 2003 through December 31, 2018 and concluded that it is more likely than not that we experienced an ownership change on April 9, 2007. This change does not limit our ability to use our existing NOLs within the carryforward period provided by the Internal Revenue Code, subject to availability of taxable income. We may experience ownership changes in the future as a result of equity offerings or other shifts in our stock ownership, some of which are outside our control. If there is a subsequent event or further change in ownership, these losses may be subject to limitations, resulting in their expiration before they can be utilized.

We assess all material positions taken in any income tax return, including all significant uncertain positions, in all tax years that are still subject to assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. As of each balance sheet date, unresolved uncertain tax positions must be reassessed, and we will determine whether (i) the factors underlying the sustainability assertion have changed and (ii) the amount of the recognized tax benefit is still appropriate. The recognition and measurement of tax benefits requires significant judgment. Judgments concerning the recognition and measurement of a tax benefit might change as new information becomes available.

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 for complying 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.

We will remain an emerging growth company until the earliest of (1) the last day of our first fiscal year (a) following the fifth anniversary of the completion of our IPO, (b) in which we have total annual gross revenues of at least $1.07 billion, or (ii) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeds $700.0 million as of the prior June 30th and (2) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period.

Recent Accounting Pronouncements

See Note 2 to our financial statements included elsewhere in this report for more 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 include interest rate sensitivities. The primary objective of our investment activities is to preserve our capital to fund our operations. We also seek to maximize income from our investments without assuming significant risk. To achieve our objectives, we maintain a portfolio of cash equivalents and investments in a variety of securities of high credit quality.

We had cash, cash equivalents and marketable securities $204.5 million and $22.0 million as of December 31, 2018 and 2017, respectively, which consisted of money market funds, commercial paper, corporate debt securities, asset-based securities and U.S. government agency securities. Such interest earning instruments carry a degree of interest rate risk; however, historical fluctuations in interest income have not been significant.

We do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate risk exposure. We have not been exposed nor do we anticipate being exposed to material risks due to changes in interest rates. A hypothetical 10% change in market interest rates would not have a material impact on our financial statements. We do not believe that our cash, cash equivalents or marketable securities have significant risk of default or illiquidity.

As of December 31, 2018 and 2017, we had $14.7 million and $14.6 million, respectively, in debt outstanding, net of debt discount. Our debt with Oxford and SVB bears interest at a floating rate that equals the greater of 7.39% or the sum of the 30-day U.S. Dollar LIBOR plus 6.40% and has a maturity date of August 1, 2021. Such interest-bearing debt carries a limited degree of interest rate risk. If overall interest rates had increased or decreased by 100 basis points during the periods presented our interest expense would not have been materially affected.

Item 8. ***Financial Statements and Supplementary Data***

SUTRO BIOPHARMA, INC.

ANNUAL REPORT ON FORM 10-K

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Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Sutro Biopharma, Inc.

Opinion on the Financial Statements

We have audited the accompanying balance sheets of Sutro Biopharma, Inc. (the Company) as of December 31, 2018 and 2017, the related statements of operations, comprehensive (loss) income, redeemable convertible preferred stock and stockholders' (deficit) equity and cash flows for each of the three years in the period ended December 31, 2018, 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, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, 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 included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2007.

Redwood City, California

March 29, 2019

SUTRO BIOPHARMA, INC.

BALANCE SHEETS
(in thousands, except share and per share data)

	December 31,	
	2018	**2017**
Assets		
Current assets:		
Cash and cash equivalents	$ 125,298	$ 22,020
Marketable securities	79,194	-
Accounts receivable, net (including amounts from related parties of $959 and $784 as of December 31, 2018 and 2017, respectively)	2,489	1,624
Prepaid expenses and other current assets	2,965	1,985
Total current assets	209,946	25,629
Property and equipment, net	10,934	13,997
Other non-current assets	2,244	1,128
Restricted cash	15	15
Total assets	$ 223,139	$ 40,769
Liabilities, Redeemable Convertible Preferred Stock, and Stockholders' Equity (Deficit)		
Current liabilities:		
Accounts payable	$ 3,061	$ 2,902
Accrued compensation	6,217	3,639
Deferred revenue—current	21,574	10,709
Debt—current	4,724	14,563
Other current liabilities	847	143
Total current liabilities	36,423	31,956
Deferred revenue, non-current	44,599	13,159
Deferred rent	476	428
Redeemable convertible preferred stock warrant liability	-	1,708
Debt—non-current	10,000	-
Other noncurrent liabilities	102	14
Total liabilities	91,600	47,265
Commitments and Contingencies		
Redeemable convertible preferred stock, $0.001 par value — zero and 177,082,393 shares authorized as of December 31, 2018 and 2017, respectively; zero and 173,750,421 shares issued and outstanding as of December 31, 2018 and 2017, respectively; no aggregate liquidation preference as of December 31, 2018	-	102,505
Stockholders' equity (deficit):		
Common stock, $0.001 par value — 300,000,000 and 271,000,000 shares authorized as of December 31, 2018 and 2017, respectively; 22,848,184 and 465,330 shares issued and outstanding as of December 31, 2018 and 2017, respectively	23	-
Preferred stock, $0.001 par value — 10,000,000 and no shares authorized as of December 31, 2018 and 2017, respectively; no shares issued and outstanding as of December 31, 2018 and 2017, respectively	-	-
Note receivable from stockholder	-	(208)
Additional paid-in-capital	281,891	6,218
Accumulated other comprehensive loss	(47)	-
Accumulated deficit	(150,328)	(115,011)
Total stockholders' equity (deficit)	131,539	(109,001)
Total liabilities, redeemable convertible preferred stock, and stockholders' equity (deficit)	$ 223,139	$ 40,769

See accompanying notes to financial statements

SUTRO BIOPHARMA, INC.

STATEMENTS OF OPERATIONS
(in thousands, except share and per share data)

	Year Ended December 31,		
	2018	**2017**	**2016**
Revenue:			
Collaboration revenue (including amounts from related parties of $13,541, $44,606 and $54,001 during the years ended December 31, 2018, 2017 and 2016, respectively) (1)	$ 32,387	$ 51,741	$ 59,731
Other revenue (including amounts from related parties of $5,425 during the year ended December 31, 2018) (1)	6,032	-	-
Total revenue	38,419	51,741	59,731
Operating expenses			
Research and development	54,262	54,639	43,550
General and administrative	21,380	16,374	14,817
Total operating expenses	75,642	71,013	58,367
(Loss) income from operations	(37,223)	(19,272)	1,364
Interest income	1,616	273	251
Interest expense	(1,623)	(612)	-
Other income (expense), net	1,913	(77)	87
Net (loss) income	$ (35,317)	$ (19,688)	$ 1,702
Net (loss) income per share, attributable to common stockholders, basic and diluted	$ (6.13)	$ (43.95)	$ -
Weighted-average shares used in computing net (loss) income per share attributable to common stockholders	5,758,875	447,946	407,735

(1) Includes $5.0 million of collaboration revenue and $3.9 million of other revenue from Celgene as related party revenue. Celgene was a related party through September 30, 2018 as it held more than 10% of our common stock for the periods presented until the closing of our IPO.

See accompanying notes to financial statements

SUTRO BIOPHARMA, INC.

STATEMENTS OF COMPREHENSIVE (LOSS) INCOME
(in thousands)

	Year Ended December 31,		
	2018	**2017**	**2016**
Net (loss) income	$ (35,317)	$ (19,688)	$ 1,702
Other comprehensive income (net of tax):			
Unrealized (loss) gain on available-for-sale securities	(47)	17	34
Comprehensive (loss) income	$ (35,364)	$ (19,671)	$ 1,736

See accompanying notes to financial statements

SUTRO BIOPHARMA, INC.

Statements of Redeemable Convertible Preferred Stock

and Stockholders' (Deficit) Equity
(in thousands, except share amounts)

	Redeemable Convertible Preferred Stock		Common Stock		Note Receivable from	Additional Paid-In-	Accumulated Other Comprehensive	Accumulated	Total Stockholders'
	Shares	Amount	Shares	Amount	Stockholder	Capital	Loss	Deficit	(Deficit) Equity
Balances at December 31, 2015	173,750,421	$ 102,505	416,279	$ -	$ (200)	$ 3,378	$ (51)	$ (97,025)	$ (93,898)
Exercise of common stock options for cash	-	-	35,552	-	-	184	-	-	184
Stock-based compensation expense	-	-	-	-	-	968	-	-	968
Vesting of early exercised shares	-	-	-	-	-	116	-	-	116
Interest on note receivable from stockholder	-	-	-	-	(7)	-	-	-	(7)
Net unrealized gain on available-for-sale securities	-	-	-	-	-	-	34	-	34
Net income	-	-	-	-	-	-	-	1,702	1,702
Balances at December 31, 2016	173,750,421	102,505	451,831	-	(207)	4,646	(17)	(95,323)	(90,901)
Exercise of common stock options for cash	-	-	13,499	-	-	95	-	-	95
Stock-based compensation expense	-	-	-	-	-	1,391	-	-	1,391
Vesting of early exercised shares	-	-	-	-	-	86	-	-	86
Interest on note receivable from stockholder	-	-	-	-	(1)	-	-	-	(1)
Net unrealized gain on available-for-sale securities	-	-	-	-	-	-	17	-	17
Net loss	-	-	-	-	-	-	-	(19,688)	(19,688)
Balances at December 31, 2017	173,750,421	102,505	465,330	-	(208)	6,218	-	(115,011)	(109,001)
Issuance of Series C and E redeemable convertible preferred stock, net of issuance costs of $644	319,865,282	84,739	-	-	-	-	-	-	-
Conversion of redeemable convertible preferred stock warrants to common stock warrants in connection with initial public offering	-	-	-	-	-	734	-	-	734
Conversion of redeemable convertible preferred stock and warrants to common stock in connection with initial public offering	(493,615,703)	(187,244)	16,007,762	16	-	187,228	-	-	187,244
Exercise of preferred stock warrants for cash	-	-	20,700	-	-	268	-	-	268
Exercise of common stock options and common stock warrants for cash	-	-	20,726	-	-	134	-	-	134
Issuance of common stock in connection with initial public offering, net of issuance costs of $10,564	-	-	5,667,000	6	-	74,430	-	-	74,436
Issuance of common stock in connection with private placement	-	-	666,666	1	-	9,999	-	-	10,000
Stock-based compensation expense	-	-	-	-	-	2,872	-	-	2,872
Vesting of early exercised shares	-	-	-	-	-	8	-	-	8
Payment of note receivable by stockholder	-	-	-	-	208	-	-	-	208
Net unrealized loss on available-for- sale securities	-	-	-	-	-	-	(47)	-	(47)
Net loss	-	-	-	-	-	-	-	(35,317)	(35,317)
Balances at December 31, 2018	-	$ -	22,848,184	$ 23	$ -	$ 281,891	$ (47)	$ (150,328)	$ 131,539

See accompanying notes to financial statements

SUTRO BIOPHARMA, INC.

STATEMENTS OF CASH FLOWS
(in thousands)

	Year Ended December 31,		
	2018	2017	2016
Operating activities			
Net (loss) income	$ (35,317)	$ (19,688)	$ 1,702
Adjustments to reconcile net (loss) income to net cash provided by (used in) operating activities:			
Depreciation and amortization	4,539	4,990	5,662
Amortization of premium (accretion of discount) on marketable securities	(527)	106	168
Stock-based compensation	2,872	1,391	968
Revaluation of redeemable convertible preferred stock warrant liability	(973)	186	(88)
Reduction of the liability attributable to a research, development and commercialization agreement	(854)	-	-
Accretion of debt discount	162	133	-
Other	175	(30)	98
Impairment of long-lived assets	-	2,742	-
Changes in operating assets and liabilities:			
Accounts receivable	(865)	(1,047)	(171)
Prepaid expenses and other assets	(2,220)	(354)	(371)
Accounts payable	209	(473)	874
Accrued compensation	2,578	451	1,238
Other liabilities	551	-	(18)
Deferred rent	48	86	(95)
Deferred revenue	42,305	(25,566)	(23,120)
Net cash provided by (used in) operating activities	12,683	(37,073)	(13,153)
Investing activities			
Purchases of marketable securities	(81,463)	(14,220)	(52,304)
Maturities of marketable securities	2,750	34,850	57,773
Sales of marketable securities	-	15,208	8,500
Purchases of property and equipment	(1,557)	(3,316)	(4,394)
Proceeds from sale of property and equipment	-	-	16
Proceeds from exercise of options for SutroVax shares	80	80	-
Net cash provided by (used in) investing activities	(80,190)	32,602	9,591
Financing activities			
Proceeds from issuance of debt	-	15,000	-
Payment of debt issuance fees	-	(170)	-
Proceeds (interest) from payment of note receivable by stockholder	208	(1)	(7)
Proceeds from issuances of redeemable convertible preferred stock, net of issuance costs	84,739	-	-
Proceeds from issuances of common stock upon initial public offering, net of issuance costs	74,436	-	-
Payment of deferred offering costs	-	(286)	-
Proceeds from issuance of common stock in private placement	10,000	-	-
Proceeds from exercise of preferred stock warrants	268	-	-
Proceeds from exercise of common stock options and common stock warrants	134	95	184
Proceeds from a research, development and commercialization agreement	1,000	-	-
Net cash provided by financing activities	170,785	14,638	177
Net increase (decrease) in cash, cash equivalents and restricted cash	103,278	10,167	(3,385)
Cash, cash equivalents and restricted cash at beginning of year	22,035	11,868	15,253
Cash, cash equivalents and restricted cash at end of year	$ 125,313	$ 22,035	$ 11,868
Supplemental disclosure of cash flow information			
Cash paid for interest	$ 1,275	$ 479	$ -
Supplemental Disclosures of Non-cash Investing and Financing Information			
Vesting of early exercised shares	$ 8	$ 86	$ 116
Conversion of redeemable convertible preferred stock and warrants into common stock upon IPO, net of issuance costs	$ 187,244	$ -	$ -
Reclassification of redeemable convertible preferred stock warrant liability to equity	$ 734	$ -	$ -
Purchase of property and equipment included in accounts payable	$ 205	$ 255	$ 532
Deferred initial public offering costs included in accounts payable	$ -	$ 259	$ -

See accompanying notes to financial statements

1.Organization and Principal Activities

Description of Business

Sutro Biopharma, Inc. (the "Company") is a clinical stage drug discovery, development and manufacturing company focused on leveraging its integrated cell-free protein synthesis and site-specific conjugation platform, XpressCF™, to create a broad variety of optimally designed, next-generation protein therapeutics for cancer and autoimmune disorders. The Company was incorporated on April 21, 2003, and was formerly known as Fundamental Applied Biology, Inc. The Company is headquartered in South San Francisco, California.

The Company operates in one business segment, the development of biopharmaceutical products.

Initial Public Offering

On September 26, 2018, the Company's registration statements on Form S-1 (File No. 333-227103 and 333-227548) relating to its initial public offering ("IPO") of its common stock were declared effective by the Securities and Exchange Commission ("SEC") and the shares of its common stock began trading on the Nasdaq Global Market on September 27, 2018. The public offering price of the shares sold in the IPO was $15.00 per share. The IPO closed on October 1, 2018, pursuant to which the Company sold 5,667,000 shares of common stock, for gross proceeds of approximately $85.0 million. The Company received net proceeds from the IPO of approximately $74.4 million, after underwriting discounts, commissions and estimated offering expenses. In addition to the shares of common stock sold in the IPO, the Company concurrently sold in a private placement to Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ, USA ("Merck"), 666,666 shares of common stock at the IPO offering price of $15.00 per share, for proceeds of approximately $10.0 million.

Immediately prior to the completion of the IPO on October 1, 2018, all outstanding shares of redeemable convertible preferred stock were converted into 16,028,462 shares of common stock. Subsequent to the closing of the IPO, there were no shares of redeemable convertible preferred stock outstanding. In addition, subsequent to the closing of the IPO, all of the outstanding redeemable convertible preferred stock warrants converted into common stock warrants resulting in the reclassification of the redeemable convertible preferred stock warrant liability to stockholder's equity at its then fair value.

Reverse Stock Split

On September 14, 2018, the Company effected a reverse split of all shares of its common stock at a ratio of 36.3-for-1. Upon the effectiveness of the reverse stock split, (i) all shares of outstanding common stock were adjusted; (ii) the number of shares of common stock for which each outstanding option to purchase common stock is exercisable were adjusted; (iii) the exercise price of each outstanding option to purchase common stock were adjusted; (iv) the conversion ratio for each share of outstanding redeemable convertible preferred stock which is convertible into the Company's common stock was proportionately reduced; (v) the number of shares of common stock for which each outstanding warrant to purchase common stock is exercisable was proportionally decreased; (vi) the conversion ratio for each outstanding warrant to purchase redeemable convertible preferred stock which is convertible into warrants to purchase the Company's common stock after the offering was proportionally decreased; and (vii) the exercise price of each outstanding warrant was proportionally increased. All of the outstanding common stock share numbers (including shares of common stock subject to the Company's options, as converted for the outstanding redeemable convertible preferred stock shares and warrants), share prices, exercise prices and per share amounts contained in the financial statements have been retroactively adjusted in the financial statements to reflect this reverse stock split for all periods presented. The par value per share and the authorized number of shares of common stock and redeemable convertible preferred stock were not adjusted as a result of the reverse stock split.

Series E Redeemable Convertible Preferred Stock Split

In July 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-1.1940912491 split ("Split") of shares of the Company's Series E redeemable convertible preferred stock, which was effected on July 26, 2018. The par value and authorized shares of redeemable convertible preferred stock and the other outstanding shares of redeemable convertible preferred stock were not adjusted as a result of the Split. All of the outstanding Series E redeemable convertible preferred shares and per share information included in the accompanying financial statements have been adjusted to reflect the Split and were converted to shares of common stock upon the closing of the Company's initial public offering on October 1, 2018.

Liquidity

The Company has incurred significant losses, except for the year ended December 31, 2016, and has negative cash flows from operations. As of December 31, 2018, there was an accumulated deficit of $150.3 million. Management expects to continue to incur additional substantial losses in the foreseeable future as a result of the Company's research and development activities.

As of December 31, 2018, the Company had unrestricted cash, cash equivalents and marketable securities of $204.5 million, which is available to fund future operations.

The Company believes that its unrestricted cash, cash equivalents and marketable securities as of December 31, 2018 will be sufficient for the Company to continue as a going concern for at least one year from the issuance date of its financial statements.

In August 2017, the Company entered into a loan and security agreement with Oxford Finance LLC ("Oxford") and Silicon Valley Bank ("SVB") under which it borrowed $15.0 million (the "August 2017 Loan") (see Note 7). The August 2017 Loan provides that an event of default will occur if, among other triggers, there occurs any circumstances that could reasonably be expected to result in a material adverse effect on the Company's business, operations or condition, or on its ability to perform its obligations under the loan. The Company disclosed in its audited financial statements as of December 31, 2017 that it believed that there was substantial doubt about its ability to continue as a going concern given its continuing operating losses and its then available capital resources, which could have been deemed to be an event of default if such condition was considered to have a material adverse effect on the Company's business, operations or condition. As a result, the Company classified the entire debt balance as a current liability as of December 31, 2017 given that a determination of such an event of default was outside of the Company's control.

2. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation and Use of Estimates

The accompanying financial statements have been prepared in accordance with U.S. generally accepted accounting principles ("U.S. GAAP"). The preparation of financial statements in conformity with U.S. 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 amounts 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 research and development periods under multiple element arrangements, stock-based compensation expense, fair value of redeemable convertible preferred stock warrant liabilities (prior to closing of the Company's IPO), fair value of common stock, (prior to closing of the Company's IPO), income taxes and certain accrued liabilities. Actual results could differ from such estimates or assumptions.

Reclassifications

Certain reclassifications have been made to prior period amounts to conform to the current year presentation.

Cash, Cash Equivalents, Marketable Securities 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. Investments with original maturities of greater than 90 days from the date of purchase but less than one year from the balance sheet date are classified as current, while investments with maturities in one year or beyond one year from the balance sheet date are classified as long-term investments. Available-for-sale marketable securities are carried at fair value, with unrealized gains and losses reported as a component of accumulated other comprehensive income (loss). Realized gains and losses are included in interest income in the Company's Statement of Operations. There were no material realized gains or losses in the periods presented. The cost of securities sold is based on the specific-identification method.

The Company invests in money market funds, commercial paper, corporate debt securities, asset-based securities and U.S. government agency securities with high credit ratings. The Company has established guidelines regarding diversification of its investments and their maturities, with the objectives of maintaining safety and liquidity while maximizing yield.

Under certain lease and credit agreements, the Company has pledged cash and cash equivalents as collateral. Restricted cash related to such agreements was $15,000 as of both December 31, 2018 and December 31, 2017.

The following table provides a reconciliation of cash and 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.

	December 31,		
	2018	2017	2016
	(in thousands)		
Cash and cash equivalents	$ 125,298	$ 22,020	$ 11,593
Restricted cash	15	15	275
Total cash, cash equivalents and restricted cash shown in the statements of cash flows	$ 125,313	$ 22,035	$ 11,868

Concentrations of Credit Risk

Cash and cash equivalents and marketable securities consist of financial instruments that potentially subject the Company to a concentration of credit risk, to the extent of the amounts recorded on the balance sheets. The Company minimizes the amount of credit exposure by investing cash that is not required for immediate operating needs in money market funds, government obligations and/or commercial paper with short maturities.

The Company regularly reviews the outstanding accounts receivable, including consideration of factors such as the age of the receivable balance. As of December 31, 2018 and 2017, there was no allowance for doubtful accounts deemed necessary. As of December 31, 2018 and 2017, the Company had an accounts receivable balance of $2.5 million and $1.6 million, respectively, attributable to the Company's collaboration agreements.

Deferred Offering Costs

The Company had deferred offering costs consisting of legal, accounting and other fees and costs directly attributable to the Company's IPO. The deferred offering costs were offset against the proceeds received upon the completion of the IPO. As of December 31, 2018, no amounts were deferred. As of December 31, 2017, $0.5 million of deferred offering costs were recorded within other non-current assets on the balance sheet.

Property and Equipment, Net

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

Impairment of Long-Lived Assets

The Company reviews long-lived assets, including property and equipment, for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. An impairment loss would be recognized when the estimated, undiscounted future cash flows expected to result from the use of the asset and its eventual disposition are less than its carrying amount. Impairment, if any, is measured as the amount by which the carrying amount of a long-lived asset exceeds its fair value.

The Company did not recognize any impairment charges during the years ended December 31, 2018 and 2016. During the year ended December 31, 2017, the Company recognized within research and development expenses in the statement of operations, an impairment charge of $2.7 million pertaining to manufacturing equipment that had been custom built for the Company, and failed to meet the acceptance criteria; therefore, the Company believed the carrying value may not be recoverable. As of December 31, 2018 and 2017, management believes that no revision to the remaining useful lives or write down of the remaining long-lived assets is required.

Redeemable Convertible Preferred Stock Warrants

The Company accounted for its redeemable convertible preferred stock warrants as a liability, recorded at their estimated fair value, because the warrants may conditionally have obligated the Company to transfer assets at some point in the future. At the end of each reporting period, changes in the estimated fair value during the period were recorded in other income (expense), net in the statement of operations. The Company continued to adjust the liability for changes in estimated fair value until the earlier of the expiration of the warrants, exercise of the warrants, or conversion of the redeemable convertible preferred stock warrants into common stock warrants upon the completion of the Company's IPO. On October 1, 2018, all redeemable convertible preferred stock warrants were converted into common stock warrants upon the closing of the IPO and will no longer be revalued to fair value.

Leases

The Company enters into lease agreements for its laboratory and office facilities. These leases are classified as operating leases. Rent expense is recognized on a straight-line basis over the term of the lease. Incentives granted under the Company's facilities leases, including allowances to fund leasehold improvements and rent holidays, are recorded as a deferred rent liability and are recognized as reductions to rental expense on a straight-line basis over the remaining term of the lease.

Revenue Recognition

Revenue is recognized when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable and collectability is reasonably assured.

For revenue agreements with multiple-elements, the Company identifies the deliverables included within the agreement and evaluates which deliverables may represent separate units of accounting, based on the achievement of certain criteria, including whether the deliverable has stand-alone value to the collaborator. Upfront payments received in connection with licenses of our technology rights are deferred if facts and circumstances dictate that the license does not have stand-alone value, and are recognized as license revenue over the estimated period of performance that is generally consistent with the terms of the research and development obligations contained in the specific collaboration and license agreement, or on a proportion of performance basis. The Company periodically reviews the estimated periods of performance based on the progress under each arrangement and accounts for the impact of any changes in estimated periods of performance on a prospective basis.

The Company recognizes revenue from milestone payments when: (i) the milestone event is substantive and its achievability has substantive uncertainty at the inception of the agreement, and (ii) the Company has completed its performance obligations related to the achievement of the milestone. Milestone payments are considered substantive if all of the following conditions are met: the milestone payment (a) is commensurate with either the Company's performance subsequent to the inception of the arrangement to achieve the milestone or the enhancement of the value of the delivered item or items as a result of a specific outcome resulting from the Company's performance subsequent to the inception of the arrangement to achieve the milestone, (b) relates solely to past performance, and (c) is reasonable relative to all of the deliverables and payment terms (including other potential milestone consideration) within the arrangement.

Determining whether and when these revenue recognition criteria have been satisfied often involves assumptions and judgments that can have a significant impact on the timing and amount of reported revenue. Changes in assumptions or judgments or changes to the elements in an arrangement could cause a material increase or decrease in the amount of revenue that is reported in a particular period.

Under certain collaborative arrangements, the Company is entitled to payments for certain research and development activities and for providing product and other related materials. The Company's policy is to account for such payments by its collaboration partners as collaboration revenue.

Stock-Based Compensation

The Company maintains a stock-based compensation plan as a long-term incentive for employees, consultants, and members of the Company's Board of Directors. The plan allows for the issuance of restricted stock units, non-statutory and incentive stock options to employees and non-statutory stock options ("NSOs") to nonemployees. The Company also maintains an employee stock purchase plan.

Share-based payments, including purchases under the Company's employee stock purchase plan, are measured using fair-value-based measurements and recognized as compensation expense over the service period in which the awards are expected to vest. The Company's fair-value-based measurements of awards to employees and directors as of the grant date utilize the single-option award-valuation approach, and the Company uses the straight-line method for expense attribution. The fair-value-based measurements of options granted to nonemployees are remeasured at each period end until the options vest and are amortized to expense as earned. The valuation model used for calculating the estimated fair value of stock awards is the Black-Scholes option-pricing model. The Black-Scholes model requires the Company to make assumptions and judgments about the variables used in the calculations, including the expected term (weighted-average period of time that the options granted are expected to be outstanding), the expected volatility of the Company's common stock, the related risk-free interest rate and the expected dividend.

Research and Development

Research and development costs are expensed as incurred. Research and development expenses consist of costs incurred in performing research and development activities: salaries, employee benefits, laboratory supplies, outsourced research and development expenses, professional services and allocated facilities-related costs. Amounts incurred in connection with collaboration arrangements are also included as a research and development expense.

Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and capitalized and recognized as an expense as the goods are delivered or the related services are performed.

For outsourced research and development expenses, such as professional fees payable to third parties for preclinical studies, clinical trials and research services, and other consulting costs, the Company estimates the expenses based on the services performed, pursuant to contracts with research institutions that conduct and manage preclinical studies, clinical trials and research services on its behalf. The Company estimates these expenses based on discussions with internal management personnel and external service providers as to the progress or stage of completion of services and the contracted fees to be paid for such services. If the actual timing of the performance of services or the level of effort varies from the original estimates, the Company will adjust the accrual accordingly. Payments made to third parties under these arrangements in advance of the performance of the related services by the third parties are recorded as prepaid expenses until the services are rendered.

Income Taxes

The Company provides for income taxes under the asset and liability method. Current income tax expense or benefit represents the amount of income taxes expected to be payable or refundable for the current year. Deferred income tax assets and liabilities are determined based on differences between the financial statement reporting and tax bases of assets and liabilities and net operating loss and credit carryforwards, and are measured using the enacted tax rates and laws that will be in effect when such items are expected to reverse. Deferred income tax assets are reduced, as necessary, by a valuation allowance when management determines it is more likely than not that some or all of the tax benefits will not be realized.

The Company accounts for uncertain tax positions in accordance with Accounting Standards Codification ("ASC") 740-10, *Accounting for Uncertainty in Income Taxes*. The Company assesses all material positions taken in any income tax return, including all significant uncertain positions, in all tax years that are still subject to assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. As of each balance sheet date, unresolved uncertain tax positions must be reassessed, and the Company will determine whether (i) the factors underlying the sustainability assertion have changed and (ii) the amount of the recognized tax benefit is still appropriate. The recognition and measurement of tax benefits requires significant judgment. Judgments concerning the recognition and measurement of a tax benefit might change as new information becomes available.

The Company includes any penalties and interest expense related to income taxes as a component of other income (expense), net and interest expense as necessary.

Fair Value Measurements

Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability, or an exit price, in the principal or most advantageous market for that asset or liability in an orderly transaction between market participants on the measurement date, and establishes a fair value hierarchy that requires an entity to maximize the use of observable inputs, where available, and minimize the use of unobservable inputs when measuring fair value. The Company determined the fair value of financial assets and liabilities using the fair value hierarchy that describes three levels of inputs that may be used to measure fair value, as follows:

Level 1—Quoted prices in active markets for identical assets and liabilities;

Level 2—Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities; and

Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The carrying amounts of accounts receivable, prepaid expenses, accounts payable, accrued liabilities and accrued compensation and benefits approximate fair value due to the short-term nature of these items.

The fair value of the Company's outstanding loan (See Note 7) is estimated using the net present value of the payments, discounted at an interest rate that is consistent with market interest rate, which is a Level 2 input. The estimated fair value of the Company's outstanding loan approximates the carrying amount, as the loan bears a floating rate that approximates the market interest rate.

Net (Loss) Income Per Share Attributable to Common Stockholders

Basic and diluted net (loss) income per share attributable to common stockholders is presented in conformity with the two-class method required for participating securities. The Company considers its redeemable convertible preferred stock to be participating securities. The holders of the Company's redeemable convertible preferred stock are entitled to receive non-cumulative dividends, payable prior and in preference to any dividends on any shares of the Company's common stock. In the event a cash dividend is paid on common stock, the holders of redeemable convertible preferred stock are also entitled to a proportionate share of any such dividend as if they were holders of common stock (on an as-if converted basis). The holders of the redeemable convertible preferred stock do not have a contractual obligation to share in losses. In accordance with the two-class method, earnings allocated to these participating securities and the related number of outstanding shares of the participating securities, which include contractual participation rights in undistributed earnings, have been excluded from the computation of basic and diluted net loss per share attributable to common stockholders.

Basic net (loss) income per share attributable to common stockholders is calculated by dividing the net (loss) income attributable to common stockholders by the weighted-average number of shares of common stock outstanding for the period, without consideration for potential dilutive common shares. Basic net loss per share is the same as diluted net loss per share as the inclusion of all potentially dilutive securities would have been anti-dilutive given the net loss of the Company.

Shares of common stock subject to repurchase are excluded from the computation of weighted-average shares as the continued vesting of such shares is contingent upon the holders' continued service to the Company. For the computation of net (loss) income per share attributable to common stockholders for the years ended December 31, 2018, 2017 and 2016, 0, 9,889 and 26,353 shares subject to repurchase, respectively, were excluded from the computation of net (loss) income per share.

Recent Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board ("FASB"), or other standard setting bodies and adopted by the Company as of the specified effective date. Unless otherwise discussed, the impact of recently issued standards that are not yet effective will not have a material impact on the Company's financial statements upon adoption. Under the Jumpstart Our Business Startups Act of 2012, as amended (the "JOBS Act"), the Company meets the definition of an emerging growth company, and has elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act.

In May 2014, the FASB issued ASU No. 2014-09 (Topic 606), Revenue from Contracts with Customers. In August 2015, the FASB issued ASU No. 2015-14 (Topic 606), Revenue from Contracts with Customers: Deferral of the Effective Date, which delayed the effective date of ASU 2014-09 by one year.

The core principle of ASU 2014-09 is that an entity should recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. ASU 2014-09 defines a five-step process to achieve this core principle and, in doing so, it is possible more judgment and estimates may be required within the revenue recognition process than required under existing U.S. generally accepted accounting pronouncements. All of the Company's revenue is currently generated from up-front payments, research, development and manufacturing services, supplies of clinical product and other research and development materials, and milestone and contingent payments under its collaboration arrangements.

The Company continues to assess the impact of the new revenue standard on the Company's financial statements. The Company will adopt the new standard and its related amendments effective January 1, 2019 using the modified retrospective method. Therefore, comparative information will not be adjusted and will continue to be reported under ASC 605 with the impact of the adoption reflected in opening accumulated deficit. The most significant impact of the standard relates to our collaboration agreement with Celgene, primarily regarding the recognition of revenue from milestone payments and the method of revenue recognition for performance obligations that are delivered over time. Under the new standard, milestone payments are included in the transaction price as variable consideration, subject to a constraint, and are allocated to the performance obligations in the contract. Therefore, the milestone payments will be recognized over the performance period rather than when achieved. In addition, legacy guidance permitted straight-line recognition of revenue for performance obligations that are delivered over time. The new standard requires an entity to recognize revenue based on the pattern of transfer of the services.

In January 2016, the FASB issued ASU 2016-01 (Topic 825), Recognition and Measurement of Financial Assets and Financial Liabilities, which will change how to recognize, measure, present and make disclosures about certain financial assets and financial liabilities. Under ASU 2016-01, if an entity designates a financial liability under the fair value option ("FVO") in accordance with ASC 825, the entity shall measure the financial liability at fair value with qualifying changes in fair value recognized in net income. The entity shall present separately in other comprehensive income the portion of the total change in the fair value of the liability that results from a change in the instrument-specific credit risk.

For public business entities, ASU 2016-01 was effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years. For all other entities other than public entities, the guidance is effective for fiscal years beginning after December 15, 2018, and interim periods within fiscal years beginning after December 15, 2019. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2016-01 will be effective for the Company for the year ended December 31, 2019, and all interim periods thereafter. The Company expects to adopt this standard on January 1, 2019. The Company does not expect the adoption of this amendment will have a material impact on its financial statements.

In February 2016, the FASB issued ASU 2016-02 (Topic 842), Leases. ASC 842 supersedes the lease recognition requirements in ASC 840, Leases. ASC 842 clarifies the definition of a lease and requires lessees to recognize right-of-use assets and lease liabilities for all leases, including those classified as operating leases under previous lease accounting guidance. For public entities, ASU 2016-02 is effective for fiscal years beginning after December 15, 2018. The guidance is effective for nonpublic business entities for fiscal years and interim periods beginning after December 15, 2019, with early adoption permitted. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2016-02 will be effective for the Company from January 1, 2020. Originally, entities were required to adopt ASU 2016-02 using a modified retrospective transition method. However, in July 2018, the FASB issued ASU 2018-11 (Topic 842), Leases: Targeted Improvements, which provides entities with an additional transition method. Under ASU 2018-11, entities have the option of initially applying ASC 842 at the adoption date, rather than at the beginning of the earliest period presented, and recognizing the cumulative effect of applying the new standard as an adjustment to beginning retained earnings in the year of adoption while continuing to present all prior periods under previous lease accounting guidance. The Company expects to elect this transition method at the adoption date of January 1, 2020. The Company is currently evaluating the impact of adopting this guidance on the Company's financial statements. The Company currently expects that its operating lease commitments will be subject to the new standard and recognized as right-of-use assets and operating lease liabilities upon adoption of this standard, which will increase the total assets and total liabilities that it reports relative to such amounts prior to adoption.

In June 2018, the FASB issued ASU 2018-07 (Topic 718), Improvements to Nonemployee Share-Based Payment Accounting. ASU 2018-07 simplifies the accounting for share-based payments to nonemployees by aligning it with the accounting for share-based payments to employees, with certain exceptions. Some of the areas of simplification apply only to nonpublic entities. For all entities, the amendments are effective for annual periods beginning after December 15, 2019, and interim periods within annual periods beginning after December 15, 2020. Early adoption is permitted for any entity in any interim or annual period for which financial statements haven't been issued or made available for issuance, but not before an entity adopts ASC 606. The Company plans to adopt this standard on January 1, 2019.

In November 2018, the FASB issued ASU 2018-18 (Topic 808), Collaborative Arrangements, Clarifying the interaction between Topic 808 and Topic 606. The amendments in ASU 2018-18 provide guidance on whether certain transactions between collaborative arrangement participants should be accounted for with revenue under Topic 606. For public business entities, the amendments in ASU 2018-18 are effective for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. For all other entities, the amendments are effective for fiscal years beginning after December 15, 2020, and interim periods within fiscal years beginning after December 15, 2021. Early adoption is permitted. An entity may not adopt the amendments earlier than its adoption date of Topic 606. The Company plans to early adopt ASU 2018-18 concurrent with the adoption of Topic 606 and does not expect the adoption to have a material effect on the financial statements.

New Accounting Pronouncements Recently adopted

In August 2016, the FASB issued ASU 2016-15 (Topic 230), Statement of Cash Flows, Classification of Certain Cash Receipts and Cash Payments, that modifies how certain cash receipts and cash payments are presented and classified in the statement of cash flows. The guidance was effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years, with earlier adoption permitted. ASU 2016-15 was adopted by the Company effective January 1, 2018 on a retrospective basis with the adoption reflected as of January 1, 2016, with no material changes reflected in the Statements of Cash Flows.

3. Fair Value Measurements and Short-Term Investments

The following table sets forth the fair value of the Company's financial assets and liabilities measured on a recurring basis by level within the fair value hierarchy:

	December 31, 2018			
	Total	Level 1	Level 2	Level 3
	(in thousands)			
Assets:				
Money market funds	$ 116,202	$ 116,202	$ -	$ -
Commercial paper	26,625	-	26,625	-
Corporate debt securities	11,774	-	11,774	-
Asset-backed securities	16,899	-	16,899	-
U.S. government agency securities	23,896	-	23,896	-
Total	$ 195,396	$ 116,202	$ 79,194	$ -

	December 31, 2017			
	Total	Level 1	Level 2	Level 3
	(in thousands)			
Assets:				
Money market funds	$ 6,578	$ 6,578	$ -	$ -
Commercial paper	7,689	-	7,689	-
Corporate debt securities	800	-	800	-
U.S. government agency securities	3,893	-	3,893	-
Total	$ 18,960	$ 6,578	$ 12,382	-
Liabilities:				
Redeemable convertible preferred stock warrant liability	$ 1,708	$ -	$ -	$ 1,708
Total	$ 1,708	$ -	$ -	$ 1,708

Where applicable, the Company uses quoted market prices in active markets for identical assets to determine fair value. This pricing methodology applies to Level 1 investments, which are composed of money market funds.

If quoted prices in active markets for identical assets are not available, then the Company uses quoted prices for similar assets or inputs other than quoted prices that are observable, either directly or indirectly. These investments are included in Level 2 and consist of commercial paper, corporate debt securities, and U.S. government agency securities. These assets are valued using market prices when available, adjusting for accretion of the purchase price to face value at maturity.

A financial instrument's categorization within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires management to make judgments and consider factors specific to the asset or liability.

In certain cases where there is limited activity or less transparency around inputs to valuation, securities are classified as Level 3 within the valuation hierarchy. Level 3 liabilities that are measured at estimated fair value on a recurring basis consist of the redeemable convertible preferred stock warrant liability. Refer to Note 10 for the valuation techniques used to measure fair value and a description of the inputs and the information used to develop the inputs to the valuation models.

Generally, increases or decreases in the fair value of the underlying redeemable convertible preferred stock would result in a directionally similar impact in the fair value measurement of the associated warrant liability. There were no transfers within the hierarchy during the years ended December 31, 2018 and 2017.

Upon closing of the IPO on October 1, 2018, a majority of the outstanding redeemable convertible preferred stock warrants either expired or were converted into common stock warrants, which resulted in the reclassification of the redeemable convertible preferred stock warrant liability to other income and additional paid-in-capital. The following table sets forth a summary of the changes in the estimated fair value of the Company's redeemable convertible preferred stock warrant liability:

	Redeemable Convertible Preferred Stock Warrant Liability
	(in thousands)
Balance as of December 31, 2016	$ 1,193
Estimated fair value of warrants issued	329
Changes in estimated fair value of warrant liability included in other income (expense), net	186
Balance as of December 31, 2017	1,708
Change in estimated fair value of warrant liability included in other income (expense), net, immediately prior to conversion of redeemable convertible preferred stock warrants to common stock warrants.	(841)
Reclassification of redeemable convertible preferred stock warrant liability to other income upon expiration	(133)
Reclassification of redeemable convertible preferred stock warrant liability to additional paid-in-capital due to conversion to common stock warrants upon completion of IPO	(734)
Balance as of December 31, 2018	$ -

4. Cash Equivalents and Marketable Securities

Cash equivalents and marketable securities consisted of the following:

	December 31, 2018			
	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
	(in thousands)			
Money market funds	$ 116,202	$ -	$ -	$ 116,202
Commercial paper	26,625	-	-	26,625
Corporate debt securities	11,795	-	(21)	11,774
Asset-based securities	16,920	-	(21)	16,899
U.S. government agencies	23,901	-	(5)	23,896
Total	195,443	-	(47)	195,396
Less amounts classified as cash equivalents	(116,202)	-	-	(116,202)
Total marketable securities	$ 79,241	$ -	$ (47)	$ 79,194

	December 31, 2017			
	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
	(in thousands)			
Money market funds	$ 6,578	$ -	$ -	$ 6,578
Commercial paper	7,689	-	-	7,689
Corporate debt securities	800	-	-	800
U.S. government agencies	3,893	-	-	3,893
Total	18,960	-	-	18,960
Less amounts classified as cash equivalents	(18,960)	-	-	(18,960)
Total marketable securities	$ -	$ -	$ -	$ -

As of December 31, 2018, some of the Company's marketable securities were in an unrealized loss position. The Company determined that it does have the ability and intent to hold all marketable securities that have been in a continuous loss position until maturity or recovery, thus there has been no recognition of any other-than-temporary impairment in the year ended December 31, 2018. All marketable securities with unrealized losses have been in a loss position for less than twelve months or the loss is not material.

All of the Company's short-term marketable securities have an effective maturity date of less than one year. No securities have contractual maturities of longer than one year.

5. Collaboration and License Agreements

The Company has recognized revenue from its collaboration and license agreements as follows:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Collaboration revenue:			
Celgene Corporation ("Celgene") (1)			
Recognition of up-front payment	$ 6,567	$ 16,694	$ 27,730
Research and development services	119	660	-
Milestones and contingent payments	10,000	27,252	26,271
Total	16,686	44,606	54,001
Merck Sharp & Dohme Corporation ("Merck")—related party:			
Recognition of up-front payment	6,985	-	
Research and development services	1,541	-	
Total	8,526	-	-
Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name "EMD Serono"):			
Recognition of up-front payment	4,142	4,120	4,120
Research and development services	3,033	3,015	1,610
Total	7,175	7,135	5,730
Total collaboration revenue	$ 32,387	$ 51,741	$ 59,731
Other revenue			
Celgene Corporation (1):			
Development and manufacturing services and clinical product supply	$ 4,501	$ -	
SutroVax—related party:			
Supply and other	1,531	-	
Total other revenue	$ 6,032	$ -	$ -
Total revenue	$ 38,419	$ 51,741	$ 59,731

(1) Includes $5.0 million of collaboration revenue and $3.9 million of other revenue from Celgene as related party revenue. Celgene was a related party through September 30, 2018 as it held more than 10% of our common stock for the periods presented until the closing of our IPO.

2014 Celgene Agreement

In September 2014, the Company signed a Collaboration and License Agreement with Celgene (the "2014 Celgene Agreement") to discover and develop bispecific antibodies and/or antibody-drug conjugates ("ADCs"), focused primarily on the field of immuno-oncology, using the Company's proprietary integrated cell-free protein synthesis platform, XpressCF™.

Upon signing the 2014 Celgene Agreement, the Company received an up-front, nonrefundable payment totaling $83.1 million. The Company was recognizing revenues from the up-front payment ratably over an approximate three-year period starting in September 2014 prior to entering into the Amended and Restated Collaboration and License Agreement with Celgene (the "2017 Celgene Agreement").

In March 2015, the Company received a $15.0 million contingent payment ("March 2015 payment") from Celgene under the 2014 Celgene Agreement that provided Celgene a right to access certain of the Company's technology for use in conjunction with certain Celgene intellectual property. In June 2016, the Company received a $25.0 million milestone ("June 2016 payment") upon completion of certain preclinical activities. The March 2015 and June 2016 payments were being recognized as revenue over the remaining portion of the estimated period of the research term prior to entering into the 2017 Celgene Agreement. Additionally, in June 2016, the Company earned a $10.0 million substantive milestone for certain manufacturing accomplishments. The entire $10.0 million amount was recognized as revenue when earned, as the Company had completed its performance obligations related to the achievement of the substantive milestone.

2017 Celgene Agreement

In August 2017, the Company entered into the 2017 Celgene Agreement to refocus its 2014 Celgene Agreement on four programs that are advancing through preclinical development, including an ADC program targeting B cell maturation antigen.

Upon signing of the 2017 Celgene Agreement, the Company received an option fee payment of $12.5 million in August 2017 and is entitled to receive a second option fee payment of $12.5 million following the first investigational new drug ("IND") clearance, if any, for one of the four programs, if Celgene desires to maintain its option to acquire the U.S. rights to develop and commercialize a second collaboration program to reach IND status. If Celgene exercises its option to acquire from the Company U.S. rights to a second collaboration program, it will make an option exercise fee payment to the Company, the amount of which depends on which program reaches IND status. The Company determined that the initial $12.5 million payment should be deferred and recognized over the entire potential period during which Celgene has an option to acquire worldwide rights to a second collaboration program. Consequently, the Company is recognizing revenue from such payment ratably over an approximate three-year period starting in August 2017 and ending in September 2020. In September 2017, the Company earned a $10.0 million milestone for certain manufacturing accomplishments, which payment was received from Celgene in October 2017. The entire $10.0 million amount was recognized as revenue when earned, as the Company had completed its performance obligations related to the achievement of the substantive milestone. In December 2018, the Company earned a $10.0 million milestone for certain manufacturing accomplishments, which payment was received from Celgene in the same month. The entire $10.0 million amount was recognized as revenue when earned, as the Company had completed its performance obligations related to the achievement of the substantive milestone.

The Company evaluated the terms of the 2017 Celgene Agreement, relative to the 2014 Celgene Agreement, and determined the 2017 Celgene Agreement to be a material modification to the 2014 Celgene Agreement for financial reporting purposes. As a result, the Company determined that the remaining deferred revenue balance of $8.2 million as of the date of entering into the 2017 Celgene Agreement, related to certain Celgene payments to the Company under the 2014 Celgene Agreement, will also be recognized ratably over an approximate three-year period starting in August 2017 and ending in September 2020 (the "Celgene Agreements"). The Company has received and will be eligible to receive financial support for research and development services assigned to the Company by Celgene, based on an agreed-upon level of full-time equivalent personnel effort and related reimbursement rate, which will be recognized as revenue as the related reimbursable activities approved by Celgene and the Company are performed by the Company.

Under the terms of the 2017 Celgene Agreement, the Company is entitled to earn development and regulatory contingent payments for each of the four programs under the collaboration, and royalties on sales of any commercial products that may result from the 2017 Celgene Agreement. For licensed products for which Celgene holds worldwide rights, the Company is eligible to receive aggregate milestone and option fee payments of up to $295.0 million for certain licensed products and up to $393.7 million for certain other licensed products under the collaboration, if approved in multiple indications, and, depending on the licensed product, tiered royalties ranging from mid-single digits to low teen percentages on worldwide sales of any commercial products that may result from the 2017 Celgene Agreement. Additionally, for licensed products for which Celgene holds ex-U.S. rights, the Company will also be eligible to receive pre-commercial contingent payments and tiered royalties ranging from mid to high single digit percentages. The contingent payments under the 2017 Celgene Agreement are not considered to be substantive milestones because the receipt of such payments is based solely on the performance of Celgene.

Celgene may terminate the 2017 Celgene Agreement at any time with 120 days' prior written notice. Either the Company or Celgene has the right to terminate the 2017 Celgene Agreement based on the other party's uncured material breach, challenge of the validity and enforceability of intellectual property, or bankruptcy.

As of December 31, 2018 and 2017, there was $11.4 million and $18.0 million, respectively, of deferred revenue related to payments received by the Company under the Celgene Agreements.

As of December 31, 2018 and 2017, the Company had $0.6 million and $0.8 million, respectively, of receivables from Celgene related to the Celgene Agreements, which are included in accounts receivable on the balance sheet.

2018 Celgene Master Services Agreement

In March 2018, the Company entered into a Master Development and Clinical Manufacturing Services Agreement (the "2018 Celgene Master Services Agreement") with Celgene, wherein Celgene requested the Company to provide development, manufacturing and supply chain management services, including clinical product supply. The consideration for the services is based on an agreed-upon level of full-time equivalent personnel effort and related reimbursement rate in addition to agreed-upon pricing for the clinical product supply.

For the year ended December 31, 2018, the Company earned $4.5 million in other revenue under the Master Services Agreement.

2018 Merck Agreement – Related Party

In July 2018, the Company entered into an Exclusive Patent License and Research Collaboration Agreement (the "2018 Merck Agreement") with Merck, a related party of the Company, to jointly develop up to three research programs focusing on cytokine derivatives for cancer and autoimmune disorders.

Under the 2018 Merck Agreement, the Company received from Merck a non-refundable, non-creditable, upfront payment of $60.0 million in August 2018 for access to the Company's technology and the identification of the preclinical research and development of two target programs, with an option for Merck to engage the Company to continue these activities for a third program upon the payment of an additional amount. The Company identified multiple deliverables under the 2018 Merck Agreement, which include access to certain intellectual property rights, performance of research and development services, and joint project team participation, and the value of the arrangement was allocated amongst the units of accounting using the Company's best estimate of selling price (BESP) of the associated deliverables. The BESP of the deliverables was developed using an estimate of the costs to provide access to the technology and personnel as described in the agreement and developed with reference to the workplans created by the parties and the associated profit margin developed by management. The Company allocated $4.4 million of the upfront payment received to the contingent third program, with such allocation representing the estimated significant incremental discount associated with the contingent deliverable. Recognition of the $4.4 million as revenue will begin upon commencement of the third program. The remaining $55.6 million of the upfront payment received was allocated to each of the units of accounting proportionately, based on BESP. The allocated revenue pertaining to the research and development services is being recognized on a proportion of performance basis, using the number of full-time equivalent (FTE) personnel effort as the basis of measurement, with such performance expected to occur over each program estimated duration of approximately three years. The allocated amount pertaining to the intellectual property rights and joint project team participation is being recognized over the total estimated term of the 2018 Merck Agreement. For the year ended December 31, 2018, the Company recognized $7.0 million of revenue associated with the upfront payment received. Additionally, the Company recognized revenue of approximately $1.5 million for FTE funding provided by Merck.

The Company is also eligible to receive aggregate milestone payments of up to $1.6 billion, assuming the development and sale of all therapeutic candidates and all possible indications identified under the collaboration. If one or more products from each of the target programs are developed for non-oncology or a single indication, the Company will be eligible for reduced aggregate milestone payments. In addition, the Company is eligible to receive tiered royalties ranging from mid-single digit to low teen percentages on the worldwide sales of any commercial products that may result from the collaboration.

Merck may terminate the 2018 Merck Agreement at any time with 60 days' prior written notice. Either the Company or Merck has the right to terminate the 2018 Merck Agreement based on the other party's uncured material breach or bankruptcy.

As of December 31, 2018, there was $53.0 million of deferred revenue related to the upfront payment received by the Company under the 2018 Merck Agreement. As of December 31, 2018, the Company had a $0.9 million receivable from Merck related to the 2018 Merck Agreement, which is included in accounts receivable on the balance sheet.

During 2018, Merck purchased 74,794,315 shares of the Company's Series E redeemable convertible preferred stock at a price per share of $0.2674, resulting in gross proceeds of $20.0 million in July 2018. In a private placement concurrent with the Company's IPO, which was completed on October 1, 2018, Merck purchased 666,666 shares of common stock at a price per share of $15.00, resulting in proceeds of approximately $10.0 million. As a result of the investments in the Company's equity, Merck is a related party.

EMD Serono Agreement

The Company signed a Collaboration Agreement and a License Agreement with EMD Serono in May 2014 and September 2014, respectively, which were entered into in contemplation of each other and therefore treated as a single agreement for accounting purposes. The Collaboration Agreement was terminated upon execution of the License Agreement (the "MDA Agreement"), which agreement is to develop ADCs for multiple cancer targets.

Upon signing the Collaboration Agreement, the Company received an up-front, nonrefundable, non-creditable payment totaling $10.0 million. Upon signing the MDA Agreement, the Company received an additional up-front, nonrefundable payment totaling $10.0 million and will receive financial support for research and development services to be provided by the Company, based on an agreed-upon level of full-time equivalent personnel effort and related reimbursement rate.

The Company identified multiple deliverables under the MDA Agreement, which include access to certain intellectual property rights, performance of research and development services, and joint project team participation. The Company considered the provisions of the multiple-element arrangement guidance in determining whether access to the intellectual property rights under the arrangement has stand-alone value. Based on the Company's expertise in applying its proprietary technology, it concluded that there is no stand-alone value of the intellectual property rights accessed by EMD Serono. Consequently, the Company determined that the identified deliverables comprise a single unit of accounting, and the up-front cash payments will be deferred and recognized over the relevant estimated period during which the Company has significant obligations to perform research and development services and participate in joint project team activities for EMD Serono. Consequently, the Company is recognizing revenues from the up-front payments ratably over an estimated five-year period starting in June 2014. Revenue for research and development services under the MDA Agreement will be recognized as revenue as the related reimbursable activities approved by EMD Serono and the Company are performed by the Company.

The Company is eligible to receive up to $52.5 million for each product developed under the MDA Agreement, primarily from pre-commercial contingent payments. In addition, the Company is eligible to receive tiered royalties ranging from low-to-mid single digit percentages, along with certain additional one-time royalties, on worldwide sales of any commercial products that may result from the MDA Agreement. The MDA Agreement term expires on a product-by-product and country-by-country basis upon the later of the expiration of the patents covering products licensed under the MDA Agreement or ten years after the first commercial sale of a product covered under the MDA Agreement. Upon expiration, EMD Serono will have a fully paid-up, royalty-free, perpetual, and irrevocable non-exclusive license, with the right to grant sublicenses, under certain Company intellectual property rights.

EMD Serono may terminate the MDA Agreement at any time with 90 days' prior written notice or upon the inability of the Company to provide EMD Serono access to a specified number of cancer drug targets. Either the Company or EMD Serono has the right to terminate the MDA Agreement based on the other party's uncured material breach or bankruptcy.

As of December 31, 2018 and 2017, there was $1.7 million and $5.9 million, respectively, of deferred revenue related to the upfront payments received by the Company under the MDA Agreement. As of December 31, 2018 and 2017, the Company had $0.9 million and $0.8 million, respectively, of receivables from EMD Serono related to the MDA Agreement, which are included in accounts receivable on the balance sheet.

SutroVax, Inc. Supply Agreement – Related Party

In May 2018, the Company entered into a Supply Agreement (the "Supply Agreement") with SutroVax, Inc., ("SutroVax"), wherein SutroVax engaged the Company to supply extracts and custom reagents, as requested by SutroVax. The pricing is based on an agreed upon cost plus arrangement. For the year ended December 31, 2018, the Company recognized $1.5 million in other revenue-related parties under the Supply Agreement. As of December 31, 2018, the Company had a $49,000 receivable from SutroVax related to the Supply Agreement, which is included in accounts receivable on the balance sheet.

The Leukemia & Lymphoma Society, Inc.

In August 2018, the Company entered into a Research, Development and Commercialization Agreement (the "LLS Agreement") with The Leukemia & Lymphoma Society ("LLS"), under which LLS has agreed to contribute up to $6.0 million in clinical development funding for STRO-001, the Company's CD74-targeting ADC to treat relapsed and/or refractory multiple myeloma and non-Hodgkin lymphoma. The funding will be provided in installments based upon the achievement of funding milestones, with any excess funding above actual expenditures refundable to LLS. The initial payment of $0.5 million was received by the Company upon execution of the LLS Agreement. As of December 31, 2018, the Company had received total payments from LLS of $1.0 million, of which $0.9 million was reflected as an offset against other income (expense) and the remaining $0.1 million was recorded in other current liabilities. In consideration for the funding to the Company under the LLS Agreement, the Company may be required in the future to make payments to LLS, contingent upon reaching certain pre-specified late-stage clinical development, regulatory and commercialization milestones and should the Company enter into certain transactions relating to STRO-001 with a third party, which payments in aggregate could total up to a maximum $19.5 million, assuming receipt by the Company from LLS of the entire $6.0 million in clinical development funding for STRO-001. As of December 31, 2018, no events have occurred that would require such payments to LLS. The LLS Agreement terminates upon the earlier of (a) fulfillment of all payment obligations by both parties or (b) 12 years after the effective date. LLS may terminate the LLS Agreement at any time with 60 days' prior written notice. Either the Company or LLS has the right to terminate the LLS Agreement based on the other party's uncured material breach.

The Company concluded that the contingent payments were an embedded derivative and recorded a related liability of approximately $0.1 million as part of other noncurrent liabilities as of December 31, 2018, with the corresponding amount recorded in the statement of operations as other income (expense), net. The value of the embedded derivative was estimated based on the probability-adjusted and discounted value of future payments.

6. Property and Equipment, Net

Property and equipment, net, consists of the following:

	December 31,	
	2018	2017
	(in thousands)	
Computer equipment and software	$ 1,484	$ 1,372
Furniture and office equipment	492	492
Laboratory equipment	22,464	21,375
Leasehold improvements	15,790	15,772
Total	40,230	39,011
Less accumulated depreciation and amortization	(29,296)	(25,014)
Total property and equipment, net	$ 10,934	$ 13,997

7. Loan and Security Agreement

In August 2017, the Company entered into a loan and security agreement with Oxford and SVB under which it borrowed $15.0 million (the "August 2017 Loan"). The loan is due in 30 monthly installments from March 2019 through its repayment in August 2021, with interest-only monthly payments until March 2019. If certain qualified funding events occur, the loan will be due in 24 monthly installments from September 2019 through its repayment in August 2021, with interest-only payments until September 2019. While the aforementioned qualified funding events occurred during the year ended December 31, 2018, the Company commenced monthly principal and interest installment payments in March 2019.

The August 2017 Loan is secured by all assets of the Company, excluding intellectual property and certain other assets. The August 2017 Loan contains customary affirmative and restrictive covenants, including with respect to fundamental transactions, the incurrence of additional indebtedness, grant liens, pay any dividend or make any distributions to the Company's holders, make investments, merge or consolidate with any other person, or engage in transactions with its affiliates, but does not include any financial covenants. The loan agreement provides that an event of default will occur if, among other triggers, there occurs any circumstances that could reasonably be expected to result in a material adverse effect on the Company's business, operations or condition, or on its ability to perform its obligations under the loan. The loan agreement also includes customary representations and warranties, other events of default and termination provisions.

As discussed in Note 1, the Company disclosed in its audited financial statements as of December 31, 2017 there was substantial doubt about the Company's ability to continue as a going concern given its continuing operating losses and its then available capital resources, which could be deemed to be an event of default if such condition was considered to have a material adverse effect on the Company's business, operations or condition. As a result, the Company classified the entire debt balance as a current liability as of December 31, 2017, given that a determination of such an event of default is outside of the Company's control. As of December 31, 2018, the Company has classified $4.7 million of the outstanding debt balance as current and $10.0 million as non-current, which reflects the scheduled repayment terms under the August 2017 Loan.

The interest charges on the loan are based on a floating rate that equals the greater of 7.39% or the sum of the 30-day U.S. Dollar London Interbank Offered Rate ("LIBOR") plus 6.40%. For the year ended December 31, 2018, the average interest rate was 8.39%. In addition, the Company will make a final payment equal to 3.83% of the original principal amount of the loan, or $0.6 million, which will be accrued over the term of the loan using the effective-interest method. As of December 31, 2018, total interest expense accrued was $0.3 million.

In connection with the August 2017 Loan, the Company issued to Oxford and SVB a warrant to purchase 454,820 shares and 227,410 shares, respectively, of Series D-2 redeemable convertible preferred stock at an exercise price of $0.6596 per share (the "2017 Warrant"). If there was a subsequent convertible preferred stock or other senior equity securities financing with a per share price less than the Series D-2 redeemable convertible preferred per share price, then the warrant would instead be to purchase such class of shares, based on the per share price of such. In May and July 2018, the Company raised a total of $85.4 million in funding through the sale and issuance of 319,305,718 shares of Series E redeemable convertible preferred stock at $0.2674 per share. Given that the price per share of the Series E redeemable convertible preferred stock was less than the Series D-2 redeemable convertible preferred per share price, the 2017 Warrant converted into a warrant to purchase a total of 1,682,871 shares of Series E redeemable convertible preferred stock at an exercise price of $0.2674 per share. Upon the closing of the Company's IPO on October 1, 2018, all Series E redeemable convertible preferred stock warrants were converted on a 1-for-0.0275 basis to 46,359 shares of warrants to purchase common stock . The warrants were exercisable from the date of issuance and have a 10-year term. As of December 31, 2018, no warrant was exercised. The estimated fair value upon issuance of the 2017 Warrant based on Series D-2 redeemable convertible preferred stock was $0.3 million, which was recorded as redeemable convertible preferred stock warrant liability. The fair value of the warrant at the date of issuance was determined using an Option Pricing Method and was recorded as a redeemable convertible preferred stock warrant liability with an offset to debt discount on the associated borrowings on the Company's balance sheet. The debt discount is being amortized to interest expense over the repayment period of the loan using the effective-interest method.

During the years ended December 31, 2018 and 2017, the Company recorded interest expense related to this loan of $1.6 million and $0.6 million, respectively. During the years ended December 31, 2018 and 2017, the Company recorded accretion of debt discount of $0.2 million and $0.1 million, respectively.

As of December 31, 2018, the Company's scheduled future principal payments for the loan are as follows:

	Amount (in thousands)
Year ending December 31, 2019	$ 5,000
Year ending December 31, 2020	6,000
Year ending December 31, 2021	4,000
Total future maturities	15,000
Less unamortized debt discount as of December 31, 2018	(276)
Ending debt balance as of December 31, 2018	$ 14,724

8. Commitments and Contingencies

Operating Lease

The Company leases its South San Francisco facility under an operating lease. The landlord provided the Company with an Extended Term Tenant Work Allowance of $0.9 million related to tenant improvements under the lease amendment entered in May 2012. The allowance was repaid through November 2016, in the form of an increased base rent amount. In May 2016, the Company exercised an option to extend the lease term of its South San Francisco facility, with fixed rental payments from December 2016 through November 2021. Under the amended lease agreement, the Company has an option to extend the lease term through November 2026. Additionally, the landlord provided the Company with a tenant improvement allowance of $0.2 million through December 1, 2017, which the Company has not accessed. If the Company elected to access the tenant improvement allowance, the related amount would be repaid through November 2021, in the form of an increased monthly base rent amount.

In May 2011, the Company entered into a lease agreement for a facility in San Carlos, California, which in August 2012 was amended to include an adjoining space in the same building, with fixed rental payments through July 31, 2016. In December 2014, the lease term was extended through July 2021. Under the lease agreement, the Company has two three-year options to extend the lease term, potentially through July 2027.

In August 2013, the Company entered into an agreement to sublease a second facility in South San Francisco, California, with fixed rental payments through March 2017. In May 2016, the Company entered into an agreement for a lease on the second facility in South San Francisco, with fixed rental payments from May 2017 through November 2021, following the end of the sublease term for the same facility. Under the lease agreement, the Company has an option to extend the lease term through November 2026.

In March 2015, the Company entered into an agreement to lease a second facility in San Carlos, California, with fixed rental payments through June 2021. Under the lease agreement, the Company has two three-year options to extend the lease term, potentially through June 2027.

As of December 31, 2018, the Company's future minimum payments under the noncancelable operating leases for the facilities are as follows:

Year Ending December 31,	Amount (in thousands)
2019	$ 3,655
2020	3,771
2021	3,195
Total future minimum lease payments	$ 10,621

Rent expense was $3.6 million, $3.2 million and $2.2 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Indemnification

In the ordinary course of business, the Company may provide indemnifications of varying scope and terms to vendors, lessors, business partners, board members, officers, and other parties with respect to certain matters, including, but not limited to, losses arising out of breach of such agreements, services to be provided by the Company, negligence or willful misconduct of the Company, violations of law by the Company, or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with directors and certain officers and employees that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors, officers or employees. No demands have been made upon the Company to provide indemnification under such agreements, and thus, there are no claims that the Company is aware of that could have a material effect on the Company's balance sheets, statements of operations, or statements of cash flows. The Company currently has directors' and officers' insurance.

9. Related-Party Transactions

Upon the Company's IPO, Celgene's ownership of the Company's outstanding equity interest decreased to less than 10%. As a result, starting October 1, 2018, the Company ceased to reflect balances and transactions associated with Celgene as a related party in its financial statements. As of December 31, 2017, Celgene owned 15.4% of the Company's outstanding equity interest. Transactions with Celgene, as of December 31, 2018 and 2017, respectively, are described in Note 5.

Related party transactions with Merck, which owned 11.9% and 0% of the Company's outstanding equity interest as of December 31, 2018 and 2017, respectively, are described in Note 5.

Three directors of the Company have performed consulting services for the Company, which consulting services were terminated prior to the Company's IPO in September 2018.

Subsequent to his appointment to the Company's Board of Directors, the Company paid to one of the directors $40,000, $60,000 and $60,000 during the years ended December 31, 2018, 2017 and 2016, respectively. Additionally, such director was granted options to purchase 9,805 shares of the Company's common stock from 2009 to 2015, at the then-current fair values of the common stock ranging from $4.36 to $11.98 per share, related to his consulting services, which vest ratably over four years. As of December 31, 2018, all of such shares were vested.

There were $0.2 million, $0.5 million and $0.7 million in transaction advisory fees during the years ended December 31, 2018, 2017 and 2016, respectively, earned and subsequently paid to a firm of which such director is a managing executive, related to the Celgene agreements. Additional payments, based on a single digit percentage of any future payments, will be made to such transaction advisory firm upon receipt of future payments under the 2017 Celgene Agreement (see Note 5).

In June 2018, the Company made an addendum to the consulting agreement with such director, pursuant to which the Company agreed to pay such director a one-time success fee of $0.4 million within 30 days of the execution of a definitive collaboration agreement with a third-party pharmaceutical company. Following the execution of the 2018 Merck Agreement in July 2018, the Company paid such director $0.4 million. The Company terminated the consulting agreement and side letter with such director prior to the Company's IPO in September 2018.

The Company paid to the second director $20,000, $30,000 and $30,000 during the years ended December 31, 2018, 2017 and 2016, respectively. Additionally, such director was granted an option to purchase 3,269 shares of the Company's common stock in September 2015 at the then-current fair value of the common stock, related to his consulting services, which vest ratably over four years.

The Company paid to the third director $20,000, $25,000 and $0 during the years ended December 31, 2018, 2017 and 2016, respectively.

On August 30, 2010, the Company received a promissory note with recourse from its chief executive officer, which was used to purchase common stock. The principal amount of the note was approximately $0.2 million, which accrued interest at 0.53%, compounding semiannually. The note could have been prepaid without penalty and was due on August 30, 2019. As of December 31, 2017, the outstanding balance was $0.2 million and the note and related interest receivable were recorded as a component of stockholders' deficit. The promissory note, including accrued interest, was paid in full by the chief executive officer in August 2018.

Investment in SutroVax, Inc. ("SutroVax")

In December 2013, the Company and Johnson & Johnson Innovation, through the Johnson & Johnson Development Corporation, provided initial co-funding for a new company, SutroVax. SutroVax leverages the Company's proprietary integrated cell-free protein synthesis platform, XpressCF™, to develop novel vaccines for a broad range of disease targets. The Company had $49,000 and $34,000 in receivables due from SutroVax as of December 31, 2018 and 2017, respectively, which were included in accounts receivable on the condensed balance sheet.

As of December 31, 2018 and 2017, the Company held a 5.6% and 7.8% common stock ownership interest in SutroVax, respectively, on a fully-diluted basis, with a carrying value of $0. The Company's investment in SutroVax was accounted for under the cost method as of both December 31, 2018 and 2017.

SutroVax qualifies as a variable interest entity. However, the Company maintains only shared power to direct the activities that most significantly impact the performance of SutroVax. Therefore, the Company is not considered the primary beneficiary and consolidation is not required.

See Note 5, SutroVax, Inc. Supply Agreement for discussion of the supply arrangement entered into with SutroVax in May 2018 and related revenue recognized for the year ended December 31, 2018.

In May 2018, the Company entered into amendments to the license agreement with SutroVax, which primarily clarified, under certain limited future circumstances SutroVax's ability to manufacture extract pursuant to the license agreement. The Company received a warrant for the purchase of 100,000 shares of SutroVax preferred stock which was valued at $0.1 million. The value of the warrants received has been recognized as other revenue-related parties during the year ended December 31, 2018 as there are no remaining deliverables under the license agreement.

10. Stockholders' Equity (Deficit)

Redeemable Convertible Preferred Stock

In May, June and July 2018, the Company raised an aggregate total of $85.4 million in funding through the sale and issuance of 319,305,718 shares of Series E redeemable convertible preferred stock at $0.2674 per share.

Redeemable convertible preferred stock, $0.001 par value, as of December 31, 2017 consisted of:

	Shares Authorized	Shares Issued and Outstanding	Original Issue Price Per Share	Carrying Value	Liquidation Preference
	(in thousands, except for share and per share amounts)				
Series A	3,503,692	3,503,692	$ 0.5900	$ 1,992	$ 2,067
Series B	24,515,966	24,345,936	0.8822	19,865	21,478
Series C	78,582,049	76,102,337	0.4797	38,035	36,506
Series C-2	8,338,892	8,338,892	0.5996	4,845	5,000
Series D	43,362,233	43,362,233	0.5996	25,900	26,000
Series D-2	18,779,561	18,097,331	0.6596	11,868	11,937
Balance at December 31, 2017	177,082,393	173,750,421		$ 102,505	$ 102,988

In connection with the completion of the Company's IPO in October 2018, all outstanding shares of Series A, Series B, Series C, Series C-2, Series D, Series D-2 and Series E were converted into 16,028,462 shares of common stock. As such, no redeemable convertible preferred stock shares were outstanding as of December 31, 2018.

Warrants

During the period from 2008 to 2012, the Company issued various warrants for the purchase of redeemable convertible preferred stock in connection with debt financings and the issuance of redeemable convertible preferred stock.

In August 2017, the Company issued warrants to Oxford and SVB to purchase an aggregate of 682,230 shares of Series D-2 redeemable convertible preferred stock at an exercise price of $0.6596 per share in connection with the issuance of August 2017 Loan (see Note 7). If there was a subsequent convertible preferred stock or other senior equity securities financing with a per share price less than the Series D-2 redeemable convertible preferred per share price, then the warrant would automatically convert to a warrant to purchase such class of shares, based on the per share price of such equity. Given that the price per share of the Series E redeemable convertible preferred stock described above was less than the price per share of the Series D-2 redeemable convertible preferred stock, the 2017 Warrant converted into a warrant to purchase a total of 1,682,871 shares of Series E redeemable convertible preferred stock at an exercise price of $0.2674 per share. The warrant is exercisable from the original date of issuance and has a 10-year term.

The Company adjusted the warrant liability for changes in fair value until the completion of its IPO on October 1, 2018, at which time certain convertible preferred stock warrants were converted into warrants for the purchase of common stock and the related convertible preferred stock warrant liability was reclassified to additional paid-in capital and others expired. On October 1, 2018, 1,232,220 shares of the Series C redeemable convertible preferred warrants were canceled, and the remaining 687,928 shares were converted to warrants to purchase common stock on a 1-for-0.0370 basis. All Series E redeemable convertible preferred warrants were converted to warrants to purchase common stock on a 1-for-0.0275 basis.

As of December 31, 2018 and 2017, the warrants related to redeemable convertible preferred stock outstanding and exercisable and their estimated fair value were as follows:

		Exercise Price Per Share	Shares as of December 31,		Estimated Fair Value as of December 31,	
Stock	Expiration Date	2018	2018	2017	2018	2017
		(in thousands except for share and per share amounts)				
Series B redeemable convertible preferred	June 2018	$ -	-	170,030	$ -	$ 116
Series C redeemable convertible preferred	September 2018	-	-	2,479,712	-	1,263
Series D-2 redeemable convertible preferred	September 2018	-	-	682,230	-	329
Series E redeemable convertible preferred	September 2018	-		-	-	-
Total			-	3,331,972	$ -	$ 1,708

Upon the completion of IPO on October 1, 2018, a majority of the redeemable convertible preferred stock warrants were converted into 71,813 shares of common stock warrants and were no longer revalued to fair value. As of September 30, 2018 and years ended December 31, 2017 and 2016, the warrants were valued using the Option Pricing Method and were estimated using the following assumptions:

	Nine months Ended September 30, 2018	Year Ended December 31, 2017	2016
Average expected life (in years)	3.1-8.8	2.5	2.5
Expected volatility	62.42%-71.21%	85.3%	84.7%
Risk-free interest rate	2.88%-3.40%	1.55%	0.83%
Expected dividend	-	-	-

Common Stock

Holders of common stock are entitled to one vote per share on all matters to be voted upon by the stockholders of the Company.

As of December 31, 2018, the Company had reserved common stock, on an if-converted basis, for issuance as follows:

	December 31, 2018	2017
Redeemable convertible preferred stock	-	5,063,404
Common stock options issued and outstanding	3,111,718	835,320
Common stock award issued and outstanding	311,240	-
Remaining shares reserved for issuance under 2004 and 2018 Equity Incentive Plan	2,525,610	91,149
Shares reserved for issuance under 2018 Employee Stock Purchase Plan	230,000	-
Warrants to purchase redeemable convertible preferred stock	-	93,527
Warrant to purchase common stock	71,813	1,099
Total	6,250,381	6,084,499

Preferred Stock

Effective October 30, 2018, the Company had 10,000,000 shares of preferred stock authorized with a par value of $0.001. No shares of preferred stock were outstanding as of December 31, 2018.

11. Equity Incentive Plans, Employee Stock Purchase Plan and Stock-Based Compensation

2004 Equity Incentive Plan and 2018 Equity Incentive Plan

In September 2018, the Company adopted the 2018 Equity Incentive Plan (“2018 Plan”), which became effective on September 25, 2018. As a result, the Company will not grant any additional awards under the 2004 Equity Incentive Plan (“2004 Plan”). The terms of the 2004 Plan and applicable award agreements will continue to govern any outstanding awards thereunder. In addition to the shares of common stock reserved for future issuance under the 2004 Plan that were added to the 2018 Plan upon its effective date, the Company has initially reserved 2,300,000 shares of common stock for issuance under the 2018 Plan. In addition, the number of shares of common stock reserved for issuance under the 2018 Plan will automatically increase on the first day of January for a period of up to ten years, commencing on January 1, 2019, in an amount equal to 5% of the total number of shares of the Company’s capital stock outstanding on the last day of the preceding year, or a lesser number of shares determined by the Company’s board of directors. As of December 31, 2018, the Company had 2,525,610 shares available for grant under the 2018 Plan.

The following table summarizes option activities under the Company's 2004 Plan and 2018 Plan:

	Outstanding Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contract Term (Years)	Aggregate Intrinsic Value
Balances at December 31, 2016	796,907	$ 10.05	7.61	$ 2,685
Granted	62,392	$ 13.10		
Exercised	(13,499)	$ 7.06		
Canceled	(10,480)	$ 12.46		
Balances at December 31, 2017	835,320	$ 10.31	6.84	$ 3,813
Granted	2,312,821	$ 14.85		
Exercised	(20,009)	$ 6.53		
Canceled	(16,414)	$ 14.49		
Balances at December 31, 2018	3,111,718	$ 13.74	8.76	$ 1,088
Exercisable at December 31, 2018	896,818	$ 10.99	6.44	$ 1,088
Vested and expected to vest at December 31, 2018	896,818	$ 10.99	6.44	$ 1,088

The aggregate intrinsic value in the table above represents the total intrinsic value (the difference between the Company's closing stock price on the last trading day of fiscal year 2018 and the exercise prices, multiplied by the number of in-the-money options) that would have been received by the stock option holders had all stock option holders exercised their stock options on December 31, 2018. For the years ended December 31, 2018, 2017 and 2016, the aggregate intrinsic value of stock options exercised was $0.2 million, $0.1 million and 0.3 million, respectively, determined at the date of the option exercise.

Employee Stock Options Valuation

For determining stock-based compensation expense under the Plan, the fair-value-based measurement of our share-based payments were estimated as of the date of grant using the Black-Scholes option pricing model with assumptions as follows:

	Year Ended December 31,		
	2018	2017	2016
Expected term (in years)	5.3-6.1	5.5-6.1	5.7-6.1
Expected volatility	54.57%-62.38%	56.52%-58.55%	58.00%-59.00%
Risk-free interest rate	2.67%-3.11%	1.89%-2.18%	1.24%-2.09%
Expected dividend	-	-	-

Expected Term—The expected term represents the period that the stock-based awards are expected to be outstanding. The Company used the "simplified" method to determine the expected term of options granted, which calculates the expected terms as the average of the weighted-average vesting term and the contractual term of the option.

Expected Volatility—Since the Company has limited information available on the volatility of its common stock due to its short trading history, the expected volatility was 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 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 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 options.

Expected Dividend—The Company has never paid dividends on its common stock. Therefore, the Company used an expected dividend yield of zero.

Using the Black-Scholes option-valuation model, the weighted-average estimated grant-date fair value of employee stock options granted during the years ended December 31, 2018, 2017 and 2016 was $9.48, $7.26 and $7.62 per share, respectively. The total fair value of options vested during the years ended December 31, 2018, 2017 and 2016 was $2.3 million, $1.6 million and $0.9 million, respectively.

Restricted Stock Units

In September 2018, the Company granted 312,400 shares of restricted common stock, or RSUs, to certain employees. These restricted shares will become fully vested over three years in September 2021. As December 31, 2018, no RSUs had vested.

A summary of the status and activity of non-vested RSUs at December 31, 2018 is as follows:

	Number of shares	Weighted Average Grant-Date Fair Value
Non-vested December 31,2017	-	-
Granted	312,400	$ 15.20
Canceled	(1,160)	$ 15.20
Non-vested December 31,2018	311,240	$ 15.20

2018 Employee Stock Purchase Plan

In September 2018, the Company adopted the 2018 Employee Stock Purchase Plan ("ESPP"), which became effective on September 26, 2018, the day that the Form S-1 related to the IPO was declared effective, in order to enable eligible employees to purchase shares of the Company's common stock. The Company initially reserved 230,000 shares of common stock for sale under the ESPP. The aggregate number of shares reserved for sale under the ESPP will increase automatically on January 1st of each of the first ten calendar years after the effective date by the number of shares equal to the lesser of 1% of the total outstanding shares of the Company's common stock as of the immediately preceding December 31 (rounded to the nearest whole share) or a number of shares as may be determined by the Company's board of directors. The aggregate number of shares issued over the term of the Company's ESPP, subject to stock-splits, recapitalizations or similar events, may not exceed 2,300,000 shares of the Company's common stock. The initial ESPP purchase date by the Company's eligible employees was March 15, 2019.

The fair value of the ESPP shares is estimated using the Black-Scholes option pricing model. For the year ended December 31, 2018, the fair value of ESPP shares was estimated using the following assumptions:

	Year Ended December 31, 2018
Expected term (in years)	0.5
Expected volatility	55.28%
Risk-free interest rate	2.37%
Expected dividend	-

As of December 31, 2018, no purchase has been made and 230,000 shares were available for future issuance under the ESPP.

Stock-Based Compensation Expense

The Company believes that the fair value of the stock options, RSUs and ESPP shares is more reliably measurable than the fair value of services received.

For the year ended December 31, 2018, the Company recorded $2.4 million stock-based compensation expense related to the stock options granted under the Company's Equity Incentive Plans, $0.4 million of stock-based compensation expense related to the RSUs and $0.1 million stock-based compensation expense related to the ESPP. As of December 31, 2018, unrecognized stock-based compensation expense related to the unvested stock options and RSUs granted was $18.2 million and $3.9 million, respectively. The remaining unrecognized compensation cost is expected to be recognized over a weighted-average period of 3.5 years and 2.5 years, respectively. As of December 31, 2018, unrecognized stock-based compensation expense related to the ESPP was $0.1 million.

Total stock-based compensation expense recognized was as follows:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Research and development	$ 619	$ 119	$ 104
General and administrative	2,253	1,272	864
Total	$ 2,872	$ 1,391	$ 968

Non-Employee Stock-Based Compensation Expense

The fair value of options granted to non-employees was estimated using the Black-Scholes method. The stock-based compensation expense related to non-employees for the years ended December 31, 2018, 2017 and 2016 was immaterial.

2017 Call Option Plan

In February 2017, the Company adopted a 2017 Call Option Plan to grant selected employees, officers, directors and consultants (collectively, the "Participants") options to purchase shares of the common stock of SutroVax, an unconsolidated investee of the Company (see Note 9). The Company has reserved 450,000 shares of SutroVax common stock as of December 31, 2018 for issuance under the program. The call options vest 25% on each of January 1, 2017, 2018, 2019, and 2020, and expire one year from the vesting date.

Using the Black-Scholes option pricing model, the call options are measured at fair value on the grant date and at each reporting period prior to their vesting, with cost recognized over the requisite service period as compensation cost. Any changes in the fair value subsequent to the vesting date are recognized in other income (expense), net in the statement of operations. Call options covering 420,000 shares have been granted with an exercise price of $0.76 per share, 210,000 of such options had vested and were exercised and 210,000 were outstanding and unvested, as of December 31, 2018 and 105,000 of such options had vested and were exercised and 315,000 of such options were outstanding and unvested, as of December 31, 2017

The amounts recognized as compensation expense related to the 2017 Call Option Plan were $65,000, and $79,000 for the year ended December 31, 2018 and 2017, respectively.

The amounts recognized as other income (expense) related to the 2017 Call Option Plan were $133,000 and $109,000 for the year ended December 31, 2018 and 2017, respectively.

12. Income Taxes

No provision for income taxes was recorded for the years ended December 31, 2018 and 2017. 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.

The effective tax rate of the Company's provision (benefit) for income taxes differs from the federal statutory rate as follows:

	Year Ended December 31,		
	2018	2017	2016
Federal statutory rate	21.0%	34.0%	34.0%
State tax	-	-	-
Change in valuation allowance	(32.7)	20.8	53.0
Tax credits	7.5	3.8	(21.6)
Stock compensation	(0.5)	-	-
Remeasurement of federal tax rate change	-	(63.4)	-
Other	4.7	4.8	(65.4)
Total	0.0%	0.0%	0.0%

The components of the Company's deferred tax assets consist of the following:

	December 31	
	2018	2017
	(in thousands)	
Deferred tax assets:		
Net operating loss carryforwards	$ 29,296	$ 23,820
Research and development credits	15,680	11,244
Deferred revenue	3,027	3,004
Accruals and other	2,342	1,103
Fixed asset basis	363	-
Total deferred tax assets	50,708	39,171
Valuation allowance	(50,708)	(39,135)
Net deferred tax assets	-	36
Deferred tax liability	-	(36)
Net deferred tax assets	$ -	$ -

Realization of the future tax benefits is dependent on the Company's ability to generate sufficient taxable income within the carryforward period. Due to the Company's history of operating losses and future sources of taxable income, the Company believes that the recognition of the deferred tax assets is currently not more likely than not to be realized and, accordingly, have provided a full valuation allowance against net deferred tax assets. For the year ended December 31, 2018, the net increase in the valuation allowance was $11.6 million, and for the year ended December 31, 2017, the net decrease in the valuation allowance was $4.0 million.

As of December 31, 2018, the Company had federal net operating loss carryforwards of $114.0 million and federal general business credits from research and development expenses totaling $10.9 million, as well as state net operating loss carryforwards of $73.4 million and state research and development credits of $9.5 million.

The federal net operating loss carryforwards will expire at various dates beginning in 2032, and the federal credits will expire at various dates beginning in 2023, if not utilized. The state net operating loss carryforwards will expire at various dates beginning in 2030, if not utilized. The state research and development tax credits can be carried forward indefinitely.

Under the Tax Reform Act, the amount of benefit from net operating loss carryforwards may be impaired or limited in certain circumstances. Events which cause limitations in the amount of net operating losses that the Company may utilize in any one year include, but are not limited to, a cumulative ownership change of more than 50%, as defined, over a three-year testing period. Such limitations may result in limitations upon the Company's ability to utilize the losses in future periods. The Company has performed a Section 382 study for the period of June 16, 2003 through December 31, 2018, and concluded that it is more likely than not that the Company experienced an ownership change on April 9, 2007. This change does not limit the Company's ability to use its existing net operating losses within the carryforward period provided by the Internal Revenue Code, subject to availability of taxable income. However, if there is subsequent event or further change in ownership, these losses may be subject to limitations, resulting in their expiration before they can be utilized.

The Company files U.S. federal and state tax returns with varying statutes of limitations. Due to net operating loss and credit carryforwards, all of the tax years since inception through the 2018 tax year remain subject to examination by the U.S. federal and some state authorities. The actual amount of any taxes due could vary significantly depending on the ultimate timing and nature of any settlement. The amount of unrecognized tax benefits, if recognized, that would affect the effective tax rate is $2.8 million, $2.3 million and $1.6 million as of December 31, 2018, 2017 and 2016, respectively. One or more of these unrecognized tax benefits could be subject to a valuation allowance if and when recognized in a future period, which could impact the timing of any related effective tax rate benefit. The Company believes that the amount by which the unrecognized tax benefits may increase or decrease within the next 12 months is not estimable.

The Company has elected to recognize, if incurred, interest and penalties related to liabilities for uncertain tax positions as a part of income tax expense. No such interest and penalties have been incurred to date.

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.

A reconciliation of the beginning and ending amounts of unrecognized tax benefits is as follows:

	December 31		
	2018	2017	2016
	(in thousands)		
Gross unrecognized tax benefit at January 1	$ 2,305	$ 1,635	$ 1,205
Additions for tax positions taken in the current year	741	670	430
Reductions for tax positions of prior years	(251)	-	-
Gross unrecognized tax benefit at December 31	$ 2,795	$ 2,305	$ 1,635

Impact of The Tax Cuts and Jobs Act

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "Tax Act") was signed into law. The Tax Act reduces the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%. The Tax Act also contains a number of provisions, many of which differ significantly from those contained in previous U.S. tax law. The Company accounts for changes in tax law in accordance with ASC 740 which requires companies to recognize the effect of such changes in the period of enactment. However, on December 22, 2017, the Securities Exchange Committee staff issued Staff Accounting Bulletin No. 118 ("SAB 118") which allowed companies to record provisional amounts during a measurement period that was similar to the measurement period used when accounting for business combinations. Accordingly, the Company adjusted its deferred taxes and related valuation allowances on a provisional basis to reflect the reduction in U.S. federal corporate tax rate from 35% to 21%, based on current understanding of the new law. The primary impact of the Tax Act resulted from the re-measurement of deferred tax assets and liabilities due to the change in the corporate tax rate, reducing the Company's deferred tax assets by $12.3 million with a corresponding reduction in its valuation allowance, which had no effect on the Company's effective tax rate. As of December 31, 2018, the Company has completed its analysis of the income tax effects of the Tax Act and there was no material impact to the Company's financial statements when the analysis was complete.

13. Net (Loss) Income Per Share Attributable to Common Stockholders

The following table sets forth the computation of the Company's basic and diluted net (loss) income per share attributable to common stockholders.

	Year Ended December 31,		
	2018	2017	2016
	(in thousands, except share and per share amounts)		
Numerator:			
Net (loss) income	$ (35,317)	$ (19,688)	$ 1,702
Noncumulative dividends on redeemable convertible preferred stock	-	-	(1,702)
Net loss attributable to common stockholders, basic and diluted	$ (35,317)	$ (19,688)	$ -
Denominator:			
Shares used in computing net loss per share attributable to common stockholders, basic and diluted	5,758,875	447,946	407,735
Net loss per share, attributable to common stockholders, basic and diluted	$ (6.13)	$ (43.95)	$ -

The following common stock equivalents were excluded from the computation of diluted net income (loss) per share for the year ended December 31, 2016 as net income attributable to common stock holders was nil, and for the years ended December 31, 2018 and 2017 because including them would have been antidilutive:

	Year Ended December 31,		
	2018	2017	2016
Redeemable convertible preferred stock	-	5,063,404	5,063,404
Common stock options and award issued and outstanding	3,422,958	835,320	796,907
Warrants to purchase redeemable convertible preferred stock	-	93,527	74,767
Warrants to purchase common stock	71,813	1,099	1,099
Early exercised shares of common stock	-	2,374	17,140
Shares to be issued under ESPP	29,416	-	-
Total	3,524,187	5,995,724	5,953,317

14. Supplementary Data – Quarterly Financial Data (unaudited)

The following table represents certain unaudited financial information for each of the quarters ended December 31, 2018 and 2017:

	Three Months Ended			
(in thousands, except per share data)	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
Revenue	$ 19,086	$ 7,836	$ 5,704	$ 5,793
Net loss	$ (1,493)	$ (10,237)	$ (11,541)	$ (12,046)
Net loss per share attributable to common stockholders, basic and diluted	$ (0.07)	$ (21.26)	$ (24.17)	$ (25.76)

	Three Months Ended			
(in thousands, except per share data)	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
Revenue	$ 4,040	$ 17,499	$ 15,357	$ 14,845
Net loss	$ (15,344)	$ (1,418)	$ (1,812)	$ (1,114)
Net loss per share attributable to common stockholders, basic and diluted	$ (33.51)	$ (3.14)	$ (4.07)	$ (2.55)

Item 9. ***Changes in and Disagreements with Accountants on Accounting and Financial Disclosure***

None.

Item 9A. ***Controls and Procedures***

Conclusions Regarding the Effectiveness of Disclosure Controls and Procedures

As of December 31, 2018, management, with the participation of our Chief Executive Officer and Chief Financial Officer, performed an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act. Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including the Chief Executive Officer and the Chief Financial Officer, to allow timely decisions regarding required disclosures.

Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objective and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of December 31, 2018, the design and operation of our disclosure controls and procedures were effective at a reasonable assurance level.

This Annual Report on Form 10-K does not include a report of management's assessment regarding internal control over financial reporting or an attestation report of our independent registered public accounting firm due to a transition period established by the rules of the Securities and Exchange Commission for newly public companies. Additionally, for as long as we remain an "emerging growth company" as defined in Section 2(a) of the Securities Act of 1933, or the Securities Act, as modified by the Jumpstart Our Business Startups Act of 2012, we intend to take advantage of the exemption permitting us not to comply with the requirement that our independent registered public accounting firm provide an attestation on the effectiveness of our internal control over financial reporting.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal controls over financial reporting.

Item 9B. ***Other Information***

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item will be set forth in our proxy statement with respect to our 2019 Annual Meeting of Stockholders, or Proxy Statement to be filed with the Securities and Exchange Commission within 120 days after our fiscal year end and is incorporated herein by reference.

We have adopted a code of business conduct and ethics that applies to all employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. The code of business conduct and ethics is available on our website at www. sutrobio.com. Amendments to, and waivers from, the code of business conduct and ethics that apply to any director, executive officer or persons performing similar functions will be disclosed at the website address provided above and, to the extent required by applicable regulations, on a Current Report on Form 8-K filed with the SEC.

Item 11. Executive Compensation

The information required by this Item will be set forth in the Proxy Statement to be filed with the Securities and Exchange Commission within 120 days after our fiscal year end and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this Item will be set forth in the Proxy Statement to be filed with the Securities and Exchange Commission within 120 days after our fiscal year end and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required by this Item will be set forth in the Proxy Statement to be filed with the Securities and Exchange Commission within 120 days after our fiscal year end and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

Information required by this item will be set forth in the Proxy Statement to be filled with the Securities and Exchange Commission within 120 days after our fiscal year end and is incorporated herein by reference.

PART IV

Item 15. ***Exhibits and Financial Statement Schedules***

(1) *Financial Statements:*

The financial statements required by Item 15(a) are filed as part of this Annual Report on Form 10-K under Item 8 "Financial Statements and Supplementary Data."

(2) *Financial Statement Schedules*

The financial statement schedules required by Item 15(a) are omitted because they are not applicable, not required or the required information is included in the financial statements or notes thereto as filed in Item 8 of this Annual Report on Form 10-K.

(3) *Exhibits.*

		Incorporated by Reference			
Exhibit Number	**Exhibit Description**	**Form**	**Date**	**Number**	**Filed Herewith**
3.1*	Amended and Restated Certificate of Incorporation of Sutro Biopharma, Inc.	S-1/A	333-227103	9/17/2018	X
3.2*	Amended and Restated Bylaws of Sutro Biopharma, Inc.	S-1/A	333-227103	9/17/2018	X
4.1	Third Amended and Restated Investors' Rights Agreement, dated May 24, 2018, by and among the Registrant and certain of its stockholders.	S-1	333-227103	8/29/2018	
4.2	Omnibus Amendment Agreement, dated July 26, 2018, by and among the Registrant and certain of its stockholders.	S-1	333-227103	8/29/2018	
4.3	Form of Warrant to Purchase Shares of Common Stock.	S-1	333-227103	8/29/2018	
4.4	Forms of Warrant to Purchase Series C Redeemable Convertible Preferred Stock.	S-1	333-227103	8/29/2018	
10.1	Form of Indemnity Agreement by and between the Registrant and its directors and officers	S-1/A	333-227103	9/17/2018	
10.2‡	2018 Equity Incentive Plan and form of award agreements thereunder	S-1/A	333-227103	9/17/2018	
10.3‡	2018 Employee Stock Purchase Plan and form of award agreements thereunder	S-1/A	333-227103	9/17/2018	
10.4‡	2004 Stock Plan, as amended, and forms of award agreements.	S-1	333-227103	8/29/2018	
10.5‡	2017 Call Option Plan and forms of award agreements.	S-1	333-227103	8/29/2018	

10.6†	Exclusive Patent License and Research Collaboration Agreement, dated July 23, 2018, by and between the Registrant and Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc., Kenilworth, NJ.	S-1/A	333-227103	9/17/2018	
10.7	Loan and Security Agreement, dated August 4, 2017, among Oxford Finance LLC, Silicon Valley Bank, and the Registrant.	S-1	333-227103	8/29/2018	
10.8*	First Amendment to Loan and Security Agreement dated December 5, 2018 among Oxford Finance LLC, Silicon Valley Bank and the Registrant.				X
10.9‡	Offer Letter, dated December 29, 2008, by and between the Registrant and William J. Newell, as amended.	S-1	333-227103	8/29/2018	
10.10‡	Offer Letter, dated December 11, 2015, by and between the Registrant and Arturo Molina, as amended.	S-1	333-227103	8/29/2018	
10.11‡	Offer Letter, dated November 12, 2010, by and between the Registrant and Trevor Hallam, as amended.	S-1	333-227103	8/29/2018	
10.12	Edgewater Business Park Lease, dated May 18, 2016, by and between the Registrant and HCP, Inc.	S-1	333-227103	8/29/2018	
10.13	Standard Industrial/Commercial Multi-Tenant Lease-Net, dated May 18, 2011, by and between the Registrant and Lydia Tseng and/or Alemany Plaza LLC, as amended.	S-1	333-227103	8/29/2018	
10.14†	Amended and Restated Collaboration and License Agreement, dated August 2, 2017, by and among Celgene Corporation, Celgene Alpine Investment Company II, LLC, and the Registrant, as amended.	S-1/A	333-227103	9/17/2018	
10.15†	License Agreement, dated September 16, 2014, by and between Merck KGaA, Darmstadt, Germany (operating in the United States and Canada under the name “EMD Serono”) and the Registrant, as amended.	S-1	333-227103	8/29/2018	
10.16†	Amended and Restated Exclusive Agreement, dated October 3, 2007, between The Board of Trustees of The Leland Stanford Junior University and Fundamental Applied Biology, Inc., as amended.	S-1/A	333-227103	9/17/2018	
21.1	Subsidiaries of the Registrant.	S-1	333-227103	8/29/2018	
23.1	Consent of independent registered public accounting firm.				X
24.1	Power of Attorney. Reference is made to the signature page hereto.				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 Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
32.2**	Certification of 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

* Filed herewith.

** This certification is deemed not filed for purposes of section 18 of the Exchange Act or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

‡ Indicates management contract or compensatory plan.

† Confidential treatment has been granted for portions of this exhibit pursuant to Rule 406 of the Securities Act, or Rule 24b-2 of the Exchange Act. The Registrant has omitted and filed separately with the SEC the confidential portions of this exhibit.

Item 16. Form 10-K Summary.

Registrants may voluntarily include a summary of information required by Form 10-K under Item 16. We have elected not to include such summary.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) the Securities Exchange Act of 1934, the registrant has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized.

SUTRO BIOPHARMA, INC.

Date: March 29, 2019

By: /s/ William J. Newell
Name: William J. Newell
Title: Chief Executive Officer

Date: March 29, 2019

By: /s/ Edward C. Albini
Name: Edward C. Albini
Title: Chief Financial Officer

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints William J. Newell and Edward C. Albini and each of them, with full power of substitution and resubstitution, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this Annual Report on Form 10-K and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agents full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorney-in-fact and agents or his substitute or substitutes may lawfully do or cause to be done by virtue thereof. Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

/s/ William J. Newell	President, Chief Executive Officer and Director	March 29, 2019
William J. Newell	*(Principal Executive Officer)*	
/s/ Edward C. Albini	Chief Financial Officer	March 29, 2019
Edward C. Albini	*(Principal Financial and Accounting Officer)*	
/s/ Michael Dybbs, Ph.D.	Director	March 29, 2019
Michael Dybbs, Ph.D.		
/s/ John G. Freund, M.D.	Director	March 29, 2019
John G. Freund, M.D.		
/s/ Daniel Janney	Director	March 29, 2019
Daniel Janney		
/s/ V. Bryan Lawlis, Ph.D.	Director	March 29, 2019
V. Bryan Lawlis, Ph.D.		
/s/ Joseph M. Lobacki	Director	March 29, 2019
Joseph M. Lobacki		
/s/ Daniel H. Petree	Director	March 29, 2019
Daniel H. Petree		
/s/ Michael Ross, Ph.D.	Director	March 29, 2019
Michael Ross, Ph.D.		
/s/ Shalini Sharp	Director	March 29, 2019
Shalini Sharp		

Exhibit 3.1

SUTRO BIOPHARMA, INC.

RESTATED CERTIFICATE OF INCORPORATION

Sutro Biopharma, Inc., a Delaware corporation, hereby certifies as follows:

1. The name of the corporation is Sutro Biopharma, Inc. The date of the filing of its original Certificate of Incorporation with the Secretary of State was April 21, 2003 under the name Fundamental Applied Biology, Inc.

2. The Restated Certificate of Incorporation of the corporation attached hereto as Exhibit "A", which is incorporated herein by this reference, and which restates, integrates and further amends the provisions of the Certificate of Incorporation of this corporation as previously amended and/or restated, has been duly adopted by this corporation's Board of Directors and by the stockholders in accordance with Sections 242 and 245 of the General Corporation Law of the State of Delaware, with the approval of the corporation's stockholders having been given by written consent without a meeting in accordance with Section 228 of the General Corporation Law of the State of Delaware.

IN WITNESS WHEREOF, this corporation has caused this Restated Certificate of Incorporation to be signed by its duly authorized officer and the foregoing facts stated herein are true and correct.

Dated: October 1, 2018

SUTRO BIOPHARMA, INC.

By: /s/ William Newell
Name: William Newell
Title: Chief Executive Officer

EXHIBIT "A"

SUTRO BIOPHARMA, INC.

RESTATED CERTIFICATE OF INCORPORATION

ARTICLE I: NAME

The name of the corporation is Sutro Biopharma, Inc. (the "***Corporation***").

ARTICLE II: AGENT FOR SERVICE OF PROCESS

The address of the Corporation's registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, Wilmington, County of New Castle, Delaware 19801. The name of the registered agent of the Corporation at that address is The Corporation Trust Company.

ARTICLE III: PURPOSE

The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of the State of Delaware (the "***General Corporation Law***").

ARTICLE IV: AUTHORIZED STOCK

1. **Total Authorized**. The total number of shares of all classes of stock that the Corporation has authority to issue is Three Hundred Ten Million (310,000,000) shares, consisting of two classes: Three Hundred Million (300,000,000) shares of Common Stock, $0.001 par value per share ("***Common Stock***"), and Ten Million (10,000,000) shares of Preferred Stock, $0.001 par value per share ("***Preferred Stock***").

2. **Designation of Additional Series**.

2.1. The Board of Directors of the Corporation (the "***Board***") is authorized, subject to any limitations prescribed by the law of the State of Delaware, to provide for the issuance of the shares of Preferred Stock in one or more series, and, by filing a Certificate of Designation pursuant to the applicable law of the State of Delaware ("***Certificate of Designation***"), to establish from time to time the number of shares to be included in each such series, to fix the designation, vesting, powers (including voting powers), preferences and relative, participating, optional or other special rights, if any, of the shares of each such series and any qualifications, limitations or restrictions thereof, and, except where otherwise provided in the applicable Certificate of Designation, to thereafter increase (but not above the total number of authorized shares of the Preferred Stock) or decrease (but not below the number of shares of such series then outstanding) the number of shares of any such series. The number of authorized shares of Preferred Stock may also be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of two-thirds of the voting power of all of the then-outstanding

shares of capital stock of the Corporation entitled to vote thereon, without a separate vote of the holders of the Preferred Stock, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law, unless a separate vote of the holders of one or more series is required pursuant to the terms of any Certificate of Designation; *provided*, *however*, that if two-thirds of the Whole Board (as defined below) has approved such increase or decrease of the number of authorized shares of Preferred Stock, then only the affirmative vote of the holders of a majority of the voting power of all of the then-outstanding shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class, without a separate vote of the holders of the Preferred Stock (unless a separate vote of the holders of one or more series is required pursuant to the terms of any Certificate of Designation), shall be required to effect such increase or decrease. For purposes of this Restated Certificate of Incorporation (as the same may be amended and/or restated from time to time, including pursuant the terms of any Certificate of Designation designating a series of Preferred Stock, this "***Certificate of Incorporation***"), the term "***Whole Board***" shall mean the total number of authorized directors whether or not there exist any vacancies in previously authorized directorships.

2.2 Except as otherwise expressly provided in any Certificate of Designation designating any series of Preferred Stock pursuant to the foregoing provisions of this Article IV, any new series of Preferred Stock may be designated, fixed and determined as provided herein by the Board without approval of the holders of Common Stock or the holders of Preferred Stock, or any series thereof, and any such new series may have powers, preferences and rights, including, without limitation, voting powers, dividend rights, liquidation rights, redemption rights and conversion rights, senior to, junior to or pari passu with the rights of the Common Stock, any series of Preferred Stock or any future class or series of capital stock of the Corporation.

2.3 Each outstanding share of Common Stock shall entitle the holder thereof to one vote on each matter properly submitted to the stockholders of the Corporation for their vote; *provided, however*, that, except as otherwise required by law, holders of Common Stock shall not be entitled to vote on any amendment to this Certificate of Incorporation (including any Certificate of Designation relating to any series of Preferred Stock) that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together as a class with the holders of one or more other such series, to vote thereon pursuant to this Certificate of Incorporation (including any Certificate of Designation relating to any series of Preferred Stock).

ARTICLE V: AMENDMENT OF BYLAWS

The Board shall have the power to adopt, amend or repeal the Bylaws of the Corporation (as the same may be amended and/or restated from time to time, the "***Bylaws***"). Any adoption, amendment or repeal of the Bylaws by the Board shall require the approval of a majority of the Whole Board. The stockholders shall also have power to adopt, amend or repeal the Bylaws; *provided*, *however*, that notwithstanding any other provision of this Certificate of Incorporation or any provision of law that might otherwise permit a lesser or no vote, but in addition to any vote of the holders of any class or series of stock of the Corporation required by applicable law or by this Certificate of Incorporation (including any Preferred Stock issued pursuant to a Certificate of Designation), the affirmative vote of the holders of at least two-thirds of the voting power of all of the then-outstanding shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class, shall be required for the stockholders to

adopt, amend or repeal any provision of the Bylaws; *provided further*, that, in the case of any proposed adoption, amendment or repeal of any provisions of the Bylaws that is approved by the Board and submitted to the stockholders for adoption thereby, if two-thirds of the Whole Board has approved such adoption, amendment or repeal of any provisions of the Bylaws, then only the affirmative vote of the holders of a majority of the voting power of all of the then-outstanding shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class, shall be required to adopt, amend or repeal any provision of the Bylaws.

ARTICLE VI: MATTERS RELATING TO THE BOARD OF DIRECTORS

1. **Director Powers**. Except as otherwise provided by the General Corporation Law or this Certificate of Incorporation, the conduct of the affairs of the Corporation shall be managed by or under the direction of the Board. In addition to the powers and authority expressly conferred upon them by applicable law or by this Certificate of Incorporation or the Bylaws of the Corporation, the directors are hereby empowered to exercise all such powers and do all such acts and things as may be exercised or done by the Corporation.

2. **Number of Directors**. Subject to the special rights of the holders of any series of Preferred Stock to elect additional directors under specified circumstances, the total number of directors constituting the Whole Board shall be fixed from time to time exclusively by resolution adopted by a majority of the Whole Board.

3. **Classified Board**. Subject to the special rights of the holders of one or more series of Preferred Stock to elect additional directors under specified circumstances, the directors shall be divided, with respect to the time for which they severally hold office, into three classes designated as Class I, Class II and Class III, respectively (the "***Classified Board***"). The Board may assign members of the Board already in office to the Classified Board, which assignments shall become effective at the same time the Classified Board becomes effective. Directors shall be assigned to each class in accordance with a resolution or resolutions adopted by the Board. The number of directors in each class shall be divided as nearly equal as reasonably possible. The initial term of office of the Class I directors shall expire at the Corporation's first annual meeting of stockholders following the closing of the Corporation's initial public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, relating to the offer and sale of Common Stock to the public (the "***Initial Public Offering***"), the initial term of office of the Class II directors shall expire at the Corporation's second annual meeting of stockholders following the closing of the Initial Public Offering and the initial term of office of the Class III directors shall expire at the Corporation's third annual meeting of stockholders following the closing of the Initial Public Offering. At each annual meeting of stockholders following the closing of the Initial Public Offering, directors elected to succeed those directors of the class whose terms then expire shall be elected for a term of office expiring at the third succeeding annual meeting of stockholders after their election.

4. **Term and Removal**. Each director shall hold office until the annual meeting at which such director's term expires and until such director's successor is duly elected and qualified, or until such director's earlier death, resignation, disqualification or removal. Any director may resign at any time upon notice to the Corporation given in writing or by any electronic transmission permitted in the Bylaws. Subject to the special rights of the holders of any series of Preferred

Stock, no director may be removed from the Board except for cause and only by the affirmative vote of the holders of at least two-thirds of the voting power of the then-outstanding shares of capital stock of the Corporation entitled to vote thereon, voting together as a single class. No decrease in the authorized number of directors constituting the Whole Board shall shorten the term of any incumbent director.

5. **Board Vacancies and Newly Created Directorships**. Subject to the special rights of the holders of any series of Preferred Stock, any vacancy occurring in the Board for any cause, and any newly created directorship resulting from any increase in the authorized number of directors, shall, unless (a) the Board determines by resolution that any such vacancies or newly created directorships shall be filled by the stockholders or (b) as otherwise provided by law, be filled only by the affirmative vote of a majority of the directors then in office, even if less than a quorum, or by a sole remaining director, and shall not be filled by the stockholders. Any director elected in accordance with the preceding sentence shall hold office for a term expiring at the annual meeting of stockholders at which the term of office of the class to which the director has been assigned expires and until such director's successor shall have been duly elected and qualified, or until such director's earlier death, resignation, disqualification or removal.

6. **Vote by Ballot**. Election of directors need not be by written ballot unless the Bylaws shall so provide.

ARTICLE VII: DIRECTOR LIABILITY

1. **Limitation of Liability**. To the fullest extent permitted by law, no director of the Corporation shall be personally liable for monetary damages for breach of fiduciary duty as a director. Without limiting the effect of the preceding sentence, if the General Corporation Law is hereafter amended to authorize the further elimination or limitation of the liability of a director, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law, as so amended.

2. **Change in Rights**. Neither any amendment nor repeal of this Article VII, nor the adoption of any provision of this Certificate of Incorporation inconsistent with this Article VII, shall eliminate, reduce or otherwise adversely affect any limitation on the personal liability of a director of the Corporation existing at the time of such amendment, repeal or adoption of such an inconsistent provision.

ARTICLE VIII: MATTERS RELATING TO STOCKHOLDERS

1. **No Action by Written Consent of Stockholders**. Subject to the rights of any series of Preferred Stock then outstanding, no action shall be taken by the stockholders of the Corporation except at a duly called annual or special meeting of stockholders and no action shall be taken by the stockholders of the Corporation by written consent in lieu of a meeting.

2. **Special Meeting of Stockholders**. Special meetings of the stockholders of the Corporation may be called only by the Chairperson of the Board, the Chief Executive Officer, the Lead Independent Director (as defined in the Bylaws), the President, or the Board acting pursuant to a resolution adopted by a majority of the Whole Board and may not be called by any other person or persons.

3. **Advance Notice of Stockholder Nominations and Business Transacted at Special Meetings**. Advance notice of stockholder nominations for the election of directors of the Corporation and of business to be brought by stockholders before any meeting of stockholders of the Corporation shall be given in the manner provided in the Bylaws. Business transacted at special meetings of stockholders shall be limited to the purpose or purposes stated in the notice of meeting.

ARTICLE IX: CHOICE OF FORUM

Unless the Corporation consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware, to the fullest extent permitted by law, shall be the sole and exclusive forum for: (a) any derivative action or proceeding brought on behalf of the Corporation; (b) any action asserting a claim of breach of a fiduciary duty owed by, or other wrongdoing by, any director, officer, stockholder, employee or agent of the Corporation to the Corporation or the Corporation's stockholders; (c) any action asserting a claim against the Corporation or any director, officer, stockholder, employee or agent of the Corporation arising pursuant to any provision of the General Corporation Law, this Certificate of Incorporation or the Bylaws or as to which the General Corporation Law confers jurisdiction on the Court of Chancery of the State of Delaware; (d) any action to interpret, apply, enforce or determine the validity of this Certificate of Incorporation or the Bylaws; or (e) any action asserting a claim against the Corporation or any director, officer, stockholder, employee or agent of the Corporation governed by the internal affairs doctrine. The provision would not apply to suits brought to enforce a duty or liability created by the Securities Exchange Act of 1934.

Any person or entity purchasing or otherwise acquiring or holding any interest in shares of capital stock of the Corporation shall be deemed to have notice of and to have consented to the provisions of this Article IX.

ARTICLE X: AMENDMENT OF CERTIFICATE OF INCORPORATION

If any provision of this Certificate of Incorporation becomes or is declared on any ground by a court of competent jurisdiction to be illegal, unenforceable or void, portions of such provision, or such provision in its entirety, to the extent necessary, shall be severed from this Certificate of Incorporation, and the court will replace such illegal, void or unenforceable provision of this Certificate of Incorporation with a valid and enforceable provision that most accurately reflects the Corporation's intent, in order to achieve, to the maximum extent possible, the same economic, business and other purposes of the illegal, void or unenforceable provision. The balance of this Certificate of Incorporation shall be enforceable in accordance with its terms.

The Corporation reserves the right to amend or repeal any provision contained in this Certificate of Incorporation in the manner prescribed by the laws of the State of Delaware and all rights conferred upon stockholders are granted subject to this reservation; *provided, however*, that, notwithstanding any other provision of this Certificate of Incorporation or any provision of law that might otherwise permit a lesser vote or no vote (but subject to Section 2 of Article IV hereof), but in addition to any vote of the holders of any class or series of the stock of the Corporation required by law or by this Certificate of Incorporation, the affirmative vote of the holders of at least two-thirds of the voting power of all of the then-outstanding shares of the capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class,

shall be required to amend or repeal this Article X or Article V, Article VI, Article VII or Article VIII; *provided*, *further*, that if two-thirds of the Whole Board has approved such amendment or repeal of any provisions of this Certificate of Incorporation, then only the affirmative vote of the holders of at least a majority of the voting power of all of the then-outstanding shares of capital stock of the Corporation entitled to vote generally in the election of directors, voting together as a single class (in addition to any other vote of the holders of any class or series of stock of the Corporation required by law of by this Certificate of Incorporation), shall be required to amend or repeal such provisions of this Certificate of Incorporation.

* * * * * * * * * * *

Exhibit 3.2

SUTRO BIOPHARMA, INC.

(a Delaware corporation)

RESTATED BYLAWS

As Adopted September 26, 2018 and

As Effective October 1, 2018

SUTRO BIOPHARMA, INC.

(a Delaware corporation)

RESTATED BYLAWS

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SUTRO BIOPHARMA, INC.

(a Delaware corporation)

RESTATED BYLAWS

As Adopted September 26, 2018 and
As Effective October 1, 2018

ARTICLE I: STOCKHOLDERS

Section 1.1: Annual Meetings

If required by applicable law, an annual meeting of stockholders shall be held for the election of directors at such date and time as the Board of Directors (the "***Board***") of Sutro Biopharma, Inc. (the "***Corporation***") shall each year fix. The meeting may be held either at a place, within or without the State of Delaware as permitted by the Delaware General Corporation Law (the "***DGCL***"), or by means of remote communication as the Board in its sole discretion may determine. Any proper business may be transacted at the annual meeting.

Section 1.2: Special Meetings

Special meetings of stockholders for any purpose or purposes shall be called in the manner set forth in the Restated Certificate of Incorporation of the Corporation (as the same may be amended and/or restated from time to time, the "***Certificate of Incorporation***"). The special meeting may be held either at a place, within or without the State of Delaware, or by means of remote communication as the Board in its sole discretion may determine. Business transacted at any special meeting of stockholders shall be limited to matters relating to the purpose or purposes stated in the notice of the meeting.

Section 1.3: Notice of Meetings

Notice of all meetings of stockholders shall be given in writing or by electronic transmission in the manner provided by applicable law (including, without limitation, as set forth in Section 7.1.1 of these Bylaws) stating the date, time and place, if any, of the meeting, the means of remote communication, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at such meeting, and the record date for determining the stockholders entitled to vote at the meeting (if such date is different from the record date for stockholders entitled to notice of the meeting). In the case of a special meeting, such notice shall also set forth the purpose or purposes for which the meeting is called. Unless otherwise required by applicable law or the Certificate of Incorporation, notice of any meeting of stockholders shall be given not less than ten (10), nor more than sixty (60), days before the date of the meeting to each stockholder of record entitled to vote at such meeting as of the record date for determining the stockholders entitled to notice of the meeting.

Section 1.4: Adjournments

The chairperson of the meeting shall have the power to adjourn the meeting to another time, date and place (if any). Any meeting of stockholders, annual or special, may be adjourned from time to time, and notice need not be given of any such adjourned meeting if the time, date and place (if any) thereof and the means of remote communication (if any) by which stockholders and proxy holders may be deemed to be present in person and vote at such adjourned meeting are announced at the meeting at which the adjournment is taken; *provided*, *however*, that if the adjournment is for more than thirty (30) days, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting. If after the adjournment a new record date for determination of stockholders entitled to vote is fixed for the adjourned meeting, the Board shall fix as the record date for determining stockholders entitled to notice of such adjourned meeting the same or an earlier date as that fixed for determination of stockholders entitled to vote at the adjourned meeting, and shall give notice of the adjourned meeting to each stockholder of record as of the record date so fixed for notice of such adjourned meeting. At the adjourned meeting, the Corporation may transact any business that might have been transacted at the original meeting. To the fullest extent permitted by law, the Corporation may postpone, reschedule or cancel any previously scheduled special or annual meeting of stockholders before it is to be held, regardless of whether any notice or public disclosure with respect to any such meeting has been sent or made pursuant to Section 1.3 hereof or otherwise, in which case notice shall be provided to the stockholders of the new date, time and place, if any, of the meeting as provided in Section 1.3 above.

Section 1.5: Quorum

Except as otherwise provided by applicable law, the Certificate of Incorporation or these Bylaws, at each meeting of stockholders the holders of a majority of the voting power of the shares of stock issued and outstanding and entitled to vote at the meeting, present in person or represented by proxy, shall constitute a quorum for the transaction of business; *provided*, *however*, that where a separate vote by a class or classes or series of stock is required by applicable law or the Certificate of Incorporation, the holders of a majority of the voting power of the shares of such class or classes or series of the stock issued and outstanding and entitled to vote on such matter, present in person or represented by proxy at the meeting, shall constitute a quorum entitled to take action with respect to the vote on such matter. If a quorum shall fail to attend any meeting, the chairperson of the meeting or, if directed to be voted on by the chairperson of the meeting, the holders of a majority of the voting power of the shares entitled to vote who are present in person or represented by proxy at the meeting may adjourn the meeting. Shares of the Corporation's stock belonging to the Corporation (or to another corporation, if a majority of the shares entitled to vote in the election of directors of such other corporation are held, directly or indirectly, by the Corporation), shall neither be entitled to vote nor be counted for quorum purposes; *provided*, *however*, that the foregoing shall not limit the right of the Corporation or any other corporation to vote any shares of the Corporation's stock held by it in a fiduciary capacity and to count such shares for purposes of determining a quorum. A quorum, once established at a meeting, shall not be broken by the withdrawal of enough votes to leave less than a quorum.

Section 1.6: Organization

Meetings of stockholders shall be presided over by (a) such person as the Board may designate, or (b) in the absence of such a person, the Chairperson of the Board, or (c) in the absence of such person, the Lead Independent Director, or, (d) in the absence of such person, the Chief Executive Officer of the Corporation, or (e) in the absence of such person, the President of the Corporation, or (f) in the absence of such person, by a Vice President. Such person shall be chairperson of the meeting and, subject to Section 1.10 hereof, shall determine the order of business and the procedure at the meeting, including such regulation of the manner of voting and the conduct of discussion as seems to him or her to be in order. The Secretary of the Corporation shall act as secretary of the meeting, but in such person's absence the chairperson of the meeting may appoint any person to act as secretary of the meeting.

Section 1.7: Voting; Proxies

Each stockholder of record entitled to vote at a meeting of stockholders may authorize another person or persons to act for such stockholder by proxy. Such a proxy may be prepared, transmitted and delivered in any manner permitted by applicable law. Except as may be required in the Certificate of Incorporation, directors shall be elected by a plurality of the votes cast by the holders of the shares present in person or represented by proxy at the meeting and entitled to vote on the election of directors. At any meeting of stockholders at which a quorum is present, unless a different or minimum vote is required by applicable law, rule or regulation applicable to the Corporation or its securities, the rules or regulations of any stock exchange applicable to the Corporation, the Certificate of Incorporation or these Bylaws, in which case such different or minimum vote shall be the applicable vote on the matter, every matter other than the election of directors shall be decided by the affirmative vote of the holders of a majority of the voting power of the shares of stock entitled to vote on such matter that are present in person or represented by proxy at the meeting and are voted for or against the matter (or if there are two or more classes or series of stock entitled to vote as separate classes, then in the case of each class or series, the holders of a majority of the voting power of the shares of stock of that class or series present in person or represented by proxy at the meeting voting for or against such matter).

Section 1.8: Fixing Date for Determination of Stockholders of Record

In order that the Corporation may determine the stockholders entitled to notice of any meeting of stockholders or any adjournment thereof, the Board may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board, and which record date shall, unless otherwise required by law, not be more than sixty (60) nor less than ten (10) days before the date of such meeting. If the Board so fixes a date, such date shall also be the record date for determining the stockholders entitled to vote at such meeting unless the Board determines, at the time it fixes such record date, that a later date on or before the date of the meeting shall be the date for making such determination. If no record date is fixed by the Board, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held. A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; *provided*, *however*, that the Board may fix a new record date for determination of stockholders entitled to vote at the adjourned meeting, and in such case shall also fix as the record date for stockholders entitled to notice of such adjourned meeting the same or an earlier date as that fixed for determination of stockholders entitled to vote in accordance herewith at the adjourned meeting.

In order that the Corporation may determine the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights, or entitled to exercise any rights in respect of any change, conversion or exchange of stock or for the purpose of any other lawful action, the Board may fix, in advance, a record date, which shall not precede the date upon which the resolution fixing the record date is adopted by the Board and which shall not be more than sixty (60) days prior to such action. If no such record date is fixed by the Board, then the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the Board adopts the resolution relating thereto.

Section 1.9: List of Stockholders Entitled to Vote

The Corporation shall prepare, at least ten (10) days before every meeting of stockholders, a complete list of stockholders entitled to vote at the meeting (*provided*, *however*, if the record date for determining the stockholders entitled to vote is less than ten (10) days before the date of the meeting, the list shall reflect the stockholders entitled to vote as of the tenth (10th) day before the meeting date), arranged in alphabetical order and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, for a period of at least ten (10) days prior to the meeting, either (a) on a reasonably accessible electronic network as permitted by applicable law (*provided* that the information required to gain access to the list is provided with the notice of the meeting), or (b) during ordinary business hours, at the principal place of business of the Corporation. If the meeting is held at a location where stockholders may attend in person, a list of stockholders entitled to vote at the meeting shall also be produced and kept at the time and place of the meeting during the whole time thereof and may be inspected by any stockholder who is present at the meeting. If the meeting is held solely by means of remote communication, then the list shall be open to the examination of any stockholder during the whole time of the meeting on a reasonably accessible electronic network, and the information required to access the list shall be provided with the notice of the meeting. Except as otherwise provided by law, the stock ledger shall be the only evidence as to who are the stockholders entitled to examine the list of stockholders required by this Section 1.9 or to vote in person or by proxy at any meeting of stockholders.

Section 1.10: Inspectors of Elections

1.10.1 Applicability. Unless otherwise required by the Certificate of Incorporation or by applicable law, the following provisions of this Section 1.10 shall apply only if and when the Corporation has a class of voting stock that is: (a) listed on a national securities exchange; (b) authorized for quotation on an interdealer quotation system of a registered national securities association; or (c) held of record by more than two thousand (2,000) stockholders. In all other cases, observance of the provisions of this Section 1.10 shall be optional, and at the discretion of the Board.

1.10.2 Appointment. The Corporation shall, in advance of any meeting of stockholders, appoint one or more inspectors of election to act at the meeting and make a written report thereof. The Corporation may designate one or more persons as alternate inspectors to replace any inspector who fails to act. If no inspector or alternate is able to act at a meeting of stockholders, the person presiding at the meeting shall appoint one or more inspectors to act at the meeting.

1.10.3 Inspector's Oath. Each inspector of election, before entering upon the discharge of his or her duties, shall take and sign an oath faithfully to execute the duties of inspector with strict impartiality and according to the best of such inspector's ability.

1.10.4 Duties of Inspectors. At a meeting of stockholders, the inspectors of election shall (a) ascertain the number of shares outstanding and the voting power of each share, (b) determine the shares represented at a meeting and the validity of proxies and ballots, (c) count all votes and ballots, (d) determine and retain for a reasonable period of time a record of the disposition of any challenges made to any determination by the inspectors, and (e) certify their determination of the number of shares represented at the meeting, and their count of all votes and ballots. The inspectors may appoint or retain other persons or entities to assist the inspectors in the performance of the duties of the inspectors.

1.10.5 Opening and Closing of Polls. The date and time of the opening and the closing of the polls for each matter upon which the stockholders will vote at a meeting shall be announced by the chairperson of the meeting at the meeting. No ballot, proxies or votes, nor any revocations thereof or changes thereto, shall be accepted by the inspectors after the closing of the polls unless the Court of Chancery upon application by a stockholder shall determine otherwise.

1.10.6 Determinations. In determining the validity and counting of proxies and ballots, the inspectors shall be limited to an examination of the proxies, any envelopes submitted with those proxies, any information provided in connection with proxies pursuant to Section 211(a)(2)b.(i) of the DGCL, or in accordance with Sections 211(e) or 212(c)(2) of the DGCL, ballots and the regular books and records of the Corporation, except that the inspectors may consider other reliable information for the limited purpose of reconciling proxies and ballots submitted by or on behalf of banks, brokers, their nominees or similar persons which represent more votes than the holder of a proxy is authorized by the record owner to cast or more votes than the stockholder holds of record. If the inspectors consider other reliable information for the limited purpose permitted herein, the inspectors at the time they make their certification of their determinations pursuant to this Section 1.10 shall specify the precise information considered by them, including the person or persons from whom they obtained the information, when the information was obtained, the means by which the information was obtained and the basis for the inspectors' belief that such information is accurate and reliable.

Section 1.11: Conduct of Meetings

The date and time of the opening and the closing of the polls for each matter upon which the stockholders will vote at a meeting shall be announced at the meeting by the person presiding over the meeting. The Board may adopt by resolution such rules and regulations for the conduct of the meeting of stockholders as it shall deem appropriate. Except to the extent inconsistent with such rules and regulations as adopted by the Board, the person presiding over any meeting of stockholders shall have the right and authority to convene and (for any or no reason) to recess and/or adjourn the meeting, to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such presiding person, are appropriate for the proper conduct of the meeting. Such rules, regulations or procedures, whether adopted by the Board or prescribed by the presiding person of the meeting, may include, without limitation, the following: (i) the establishment of an agenda or order of business for the meeting; (ii) rules and procedures for maintaining order at the meeting and the safety of those present; (iii) limitations on attendance at

or participation in the meeting to stockholders entitled to vote at the meeting, their duly authorized and constituted proxies or such other persons as the presiding person of the meeting shall determine; (iv) restrictions on entry to the meeting after the time fixed for the commencement thereof; and (v) limitations on the time allotted to questions or comments by participants. The presiding person at any meeting of stockholders, in addition to making any other determinations that may be appropriate to the conduct of the meeting, shall, if the facts warrant, determine and declare to the meeting that a matter or business was not properly brought before the meeting and if such presiding person should so determine, such presiding person shall so declare at the meeting and any such matter or business not properly brought before the meeting shall not be transacted or considered. Unless and to the extent determined by the Board or the person presiding over the meeting, meetings of stockholders shall not be required to be held in accordance with the rules of parliamentary procedure.

Section 1.12: Notice of Stockholder Business; Nominations.

1.12.1 Annual Meeting of Stockholders.

(a) Nominations of persons for election to the Board and the proposal of other business to be considered by the stockholders may be made at an annual meeting of stockholders only: (i) pursuant to the Corporation's notice of such meeting (or any supplement thereto), (ii) by or at the direction of the Board or any committee thereof or (iii) by any stockholder of the Corporation who was a stockholder of record at the time of giving of the notice provided for in this Section 1.12 (the "***Record Stockholder***"), who is entitled to vote at such meeting and who complies with the notice and other procedures set forth in this Section 1.12 in all applicable respects. For the avoidance of doubt, the foregoing clause (iii) shall be the exclusive means for a stockholder to make nominations or propose business (other than business included in the Corporation's proxy materials pursuant to Rule 14a-8 under the Securities Exchange Act of 1934, as amended (such act, and the rules and regulations promulgated thereunder, the "***Exchange Act***")), at an annual meeting of stockholders, and such stockholder must fully comply with the notice and other procedures set forth in this Section 1.12 to make such nominations or propose business before an annual meeting.

(b) For nominations or other business to be properly brought before an annual meeting by a Record Stockholder pursuant to Section 1.12.1(a) of these Bylaws:

(i) the Record Stockholder must have given timely notice thereof in writing to the Secretary of the Corporation and provide any updates or supplements to such notice at the times and in the forms required by this Section 1.12;

(ii) such other business (other than the nomination of persons for election to the Board) must otherwise be a proper matter for stockholder action;

(iii) if the Proposing Person (as defined below) has provided the Corporation with a Solicitation Notice (as defined below), such Proposing Person must, in the case of a proposal other than the nomination of persons for election to the Board, have delivered a proxy statement and form of proxy to holders of at least the percentage of the Corporation's voting shares required under applicable law to carry any such proposal, or, in the case of a nomination or nominations, have delivered a proxy statement and form of proxy to holders of a percentage of the Corporation's voting shares reasonably believed by such Proposing Person to be sufficient to elect the nominee or nominees proposed to be nominated by such Record Stockholder, and must, in either case, have included in such materials the Solicitation Notice; and

(iv) if no Solicitation Notice relating thereto has been timely provided pursuant to this Section 1.12, the Proposing Person proposing such business or nomination must not have solicited a number of proxies sufficient to have required the delivery of such a Solicitation Notice under this Section 1.12.

To be timely, a Record Stockholder's notice must be delivered to the Secretary at the principal executive offices of the Corporation not later than the close of business on the ninetieth (90th) day nor earlier than the close of business on the one hundred and twentieth (120th) day prior to the first anniversary of the preceding year's annual meeting (except in the case of the Corporation's first annual meeting following its initial public offering, for which such notice shall be timely if delivered in the same time period as if such meeting were a special meeting governed by Section 1.12.2 of these Bylaws); *provided*, *however*, that in the event that the date of the annual meeting is more than thirty (30) days before or more than seventy (70) days after such anniversary date, notice by the Record Stockholder to be timely must be so delivered (A) no earlier than the close of business on the one hundred and twentieth fifth (120th) day prior to such annual meeting and (B) no later than the close of business on the later of the ninetieth (90th) day prior to such annual meeting or the close of business on the tenth (10th) day following the day on which Public Announcement (as defined below) of the date of such meeting is first made by the Corporation. In no event shall an adjournment or postponement of an annual meeting commence a new time period (or extend any time period) for providing the Record Stockholder's notice. Such Record Stockholder's notice shall set forth:

(x) as to each person whom the Record Stockholder proposes to nominate for election or reelection as a director:

(i) the name, age, business address and residence address of such person;

(ii) the principal occupation or employment of such nominee;

(iii) the class, series and number of any shares of stock of the Corporation that are beneficially owned or owned of record by such person or any Associated Person (as defined below);

(iv) the date or dates such shares were acquired and the investment intent of such acquisition;

(v) all other information relating to such person that would be required to be disclosed in solicitations of proxies for election of directors in an election contest (even if an election contest is not involved), or would be otherwise required, in each case pursuant to and in accordance with Section 14(a) (or any successor provision) under the Exchange Act and the rules and regulations thereunder;

(vi) such person's written consent to being named in the Corporation's proxy statement as a nominee, to the public disclosure of information regarding or related to such person provided to the Corporation by such person or otherwise pursuant to this Section 1.12 and to serving as a director if elected; and

(vii) whether such person meets the independence requirements of the stock exchange upon which the Corporation's Common Stock is primarily traded.

(y) as to any other business that the Record Stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the text of the proposal or business (including the text of any resolutions proposed for consideration and in the event that such business includes a proposal to amend the Bylaws, the text of the proposed amendment), the reasons for conducting such business at the meeting and any material interest in such business of such Proposing Person, including any anticipated benefit to any Proposing Person therefrom; and

(z) as to each Proposing Person giving the notice:

(i) the current name and address of such Proposing Person, including, if applicable, their name and address as they appear on the Corporation's stock ledger, if different;

(ii) the class or series and number of shares of stock of the Corporation that are directly or indirectly owned of record or beneficially owned by such Proposing Person, including any shares of any class or series of the Corporation as to which such Proposing Person has a right to acquire beneficial ownership at any time in the future;

(iii) whether and the extent to which any derivative interest in the Corporation's equity securities (including without limitation any option, warrant, convertible security, stock appreciation right, or similar right with an exercise or conversion privilege or a settlement payment or mechanism at a price related to any class or series of shares of the Corporation or with a value derived in whole or in part from the value of any class or series of shares of the Corporation, whether or not such instrument or right shall be subject to settlement in the underlying class or series of shares of the Corporation or otherwise, and any cash-settled equity swap, total return swap, synthetic equity position or similar derivative arrangement, as well as any rights to dividends on the shares of any class or series of shares of the Corporation that are separated or separable from the underlying shares of the Corporation) or any short interest in any security of the Corporation (for purposes of this Bylaw a person shall be deemed to have a short interest in a security if such person directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has the opportunity to profit or share in any profit derived from any increase or decrease in the value of the subject security, including through performance-related fees) is held directly or indirectly by or for the benefit of such Proposing Person, including without limitation whether and the extent to which any ongoing hedging or other transaction or series of transactions has been entered into by or on behalf of, or any other agreement, arrangement or understanding (including without limitation any short position or any borrowing or lending of shares) has been made, the effect or intent of which is to mitigate loss to or manage risk or benefit of share price changes for, or to increase or decrease the voting power of, such Proposing Person with respect to any share of stock of the Corporation;

(iv) any other material relationship between such Proposing Person, on the one hand, and the Corporation, any affiliate of the Corporation or any principal competitor of the Corporation, on the other hand;

(v) any direct or indirect material interest in any material contract or agreement with the Corporation, any affiliate of the Corporation or any principal competitor of the Corporation (including, in any such case, any employment agreement, collective bargaining agreement or consulting agreement);

(vi) any other information relating to such Proposing Person that would be required to be disclosed in a proxy statement or other filing required to be made in connection with solicitations of proxies or consents by such Proposing Person in support of the business proposed to be brought before the meeting pursuant to Section 14(a) (or any successor provision) under the Exchange Act and the rules and regulations thereunder (the disclosures to be made pursuant to the foregoing clauses (iv) through (vi) are referred to as "Disclosable Interests"). For purposes hereof "Disclosable Interests" shall not include any information with respect to the ordinary course business activities of any broker, dealer, commercial bank, trust company or other nominee who is a Proposing Person solely as a result of being the stockholder directed to prepare and submit the notice required by these Bylaws on behalf of a beneficial owner;

(vii) such Proposing Person's written consent to the public disclosure of information provided to the Corporation pursuant to this Section 1.12;

(viii) a complete written description of any agreement, arrangement or understanding (whether oral or in writing) (including any knowledge that another person or entity is Acting in Concert (as defined below with such Proposing Person) between or among such Proposing Person, any of its respective affiliates or associates and any other person Acting in Concert with any of the foregoing persons;

(ix) as to each person whom such Proposing Person proposes to nominate for election or re-election as a director, any agreement, arrangement or understanding of such person with any other person or entity other than the Corporation with respect to any direct or indirect compensation, reimbursement or indemnification in connection with service or action as a director known to such Proposing Person after reasonable inquiry;

(x) a representation that the Record Stockholder is a holder of record of stock of the Corporation entitled to vote at such meeting and intends to appear in person or by proxy at the meeting to propose such business or nomination;

(xi) a representation whether such Proposing Person intends (or is part of a group that intends) to deliver a proxy statement or form of proxy to holders of, in the case of a proposal, at least the percentage of the Corporation's voting shares required under applicable law to carry the proposal or, in the case of a nomination or nominations, a sufficient number of holders of the Corporation's voting shares to elect such nominee or nominees (an affirmative statement of such intent being a "Solicitation Notice"); and

(xii) any proxy, contract, arrangement, or relationship pursuant to which the Proposing Person has a right to vote, directly or indirectly, any shares of any security of the Corporation.

A stockholder providing written notice required by this Section 1.12 will update and supplement such notice in writing, if necessary, so that the information provided or required to be provided in such notice is true and correct in all material respects as of (i) the record date for determining the stockholders entitled to notice of the meeting and (ii) the close of business on the fifth (5th) business day prior to the meeting and, in the event of any adjournment or postponement thereof, the close of business on the fifth (5th) business day prior to such adjourned or postponed meeting. In the case of an update and supplement pursuant to clause (i) of the foregoing sentence, such update and supplement will be received by the Secretary of the Corporation at the principal executive office of the Corporation not later than five (5) business days after the record date for determining the stockholders entitled to notice of the meeting, and in the case of an update and supplement pursuant to clause (ii) of the foregoing sentence, such update and supplement will be received by the Secretary of the Corporation at the principal executive office of the Corporation not later than two (2) business days prior to the date for the meeting, and, in the event of any adjournment or postponement thereof, two (2) business days prior to such adjourned or postponed meeting.

(c) Notwithstanding anything in the second sentence of Section 1.12.1(b) of these Bylaws to the contrary, in the event that the number of directors to be elected to the Board is increased and there is no Public Announcement by the Corporation naming all of the nominees for director or specifying the size of the increased Board at least one hundred (100) days prior to the first anniversary of the preceding year's annual meeting, or, if the annual meeting is held more than thirty (30) days before or seventy (70 days after such anniversary date, if there is no such Public Announcement by the Corporation at least seventy five (75) days prior to such annual meeting (in each case except for the Corporation's first annual meeting following its initial public offering, for which this Section 1.12.1(c) shall apply if and only if there is no such Public Announcement prior to the date that is ten (10) days prior to the date on which a stockholder's written notice for such annual meeting would otherwise be required to be delivered to the Secretary of the Corporation), a stockholder's notice required by this Section 1.12 shall also be considered timely, but only with respect to nominees for any new directorships created by such increase, if it shall be delivered to the Secretary of the Corporation at the principal executive office of the Corporation no later than the close of business on the tenth (10th) day following the day on which such Public Announcement is first made by the Corporation.

(d) Notwithstanding anything in Section 1.12 or any other provision of the Bylaws to the contrary, any person who has been determined by a majority of the Whole Board to have violated Section 2.12 of these Bylaws or a Board Confidentiality Policy (as defined below) while serving as a director of the Corporation in the preceding five (5) years shall be ineligible to be nominated or be qualified to serve as a member of the Board, absent a prior waiver for such nomination or qualification approved by two-thirds of the Whole Board.

1.12.2 Special Meetings of Stockholders. Only such business shall be conducted at a special meeting of stockholders as shall have been brought before the meeting pursuant to the Corporation's notice of such meeting. Nominations of persons for election to the Board may be made at a special meeting of stockholders at which directors are to be elected pursuant to the Corporation's notice of such meeting (a) by or at the direction of the Board or any committee thereof or (b) provided that the Board has determined that directors shall be elected at such meeting, by any stockholder of the Corporation who is a stockholder of record at the time of giving of notice of the special meeting, who shall be entitled to vote at the meeting and who complies

with the notice and other procedures set forth in this Section 1.12 in all applicable respects. In the event the Corporation calls a special meeting of stockholders for the purpose of electing one or more directors to the Board, any such stockholder may nominate a person or persons (as the case may be), for election to such position(s) as specified in the Corporation's notice of meeting, if the stockholder's notice required by Section 1.12.1(b) of these Bylaws shall be delivered to the Secretary of the Corporation at the principal executive offices of the Corporation (i) no earlier than the one hundred and twentieth (120th) day prior to such special meeting and (ii) no later than the close of business on the later of the ninetieth (90th) day prior to such special meeting or the tenth (10th) day following the day on which Public Announcement is first made of the date of the special meeting and of the nominees proposed by the Board to be elected at such meeting. In no event shall an adjournment or postponement of a special meeting commence a new time period (or extend any time period) for providing such notice.

1.12.3 General.

(a) Except as otherwise expressly provided in any applicable rule or regulation promulgated under the Exchange Act, only such persons who are nominated in accordance with the procedures set forth in this Section 1.12 shall be eligible to be elected at a meeting of stockholders and serve as directors and only such business shall be conducted at a meeting of stockholders as shall have been brought before the meeting in accordance with the procedures set forth in this Section 1.12. Except as otherwise provided by law or these Bylaws, the chairperson of the meeting shall have the power and duty to determine whether a nomination or any other business proposed to be brought before the meeting was made or proposed, as the case may be, in accordance with the procedures set forth in this Section 1.12 and, if any proposed nomination or business is not in compliance herewith, to declare that such defective proposal or nomination shall be disregarded. Notwithstanding the foregoing provisions of this Section 1.12, unless otherwise required by law, if the stockholder (or a Qualified Representative of the stockholder (as defined below)) does not appear at the annual or special meeting of stockholders of the Corporation to present a nomination or proposed business, such nomination shall be disregarded and such proposed business shall not be transacted, notwithstanding that proxies in respect of such vote may have been received by the Corporation.

(b) Notwithstanding the foregoing provisions of this Section 1.12, a stockholder shall also comply with all applicable requirements of the Exchange Act and the rules and regulations thereunder with respect to the matters set forth herein. Nothing in this Section 1.12 shall be deemed to affect any rights of (a) stockholders to request inclusion of proposals in the Corporation's proxy statement pursuant to Rule 14a-8 under the Exchange Act or (b) the holders of any series of Preferred Stock to elect directors pursuant to any applicable provisions of the Certificate of Incorporation.

(c) For purposes of this Section 1.12 the following definitions shall apply:

(A) a person shall be deemed to be "***Acting in Concert***" with another person if such person knowingly acts (whether or not pursuant to an express agreement, arrangement or understanding) in concert with, or toward a common goal relating to the management, governance or control of the Corporation in substantial parallel with, such other person where (1) each person is conscious of the other person's conduct or intent and this awareness is an element in their decision-making processes and (2) at least one additional factor suggests that such persons intend to act in concert or in substantial parallel, which such additional factors may include, without limitation, exchanging information (whether publicly or privately), attending meetings, conducting discussions or making or soliciting invitations to act in concert or in substantial parallel; provided that a person shall not be deemed to be Acting in Concert with any other person solely as a result of the solicitation or receipt of revocable proxies or consents from such other person in response to a solicitation made pursuant to, and in accordance with, Section 14(a) (or any successor provision) of the Exchange Act by way of a proxy or consent solicitation statement filed on Schedule 14A. A person Acting in Concert with another person shall be deemed to be Acting in Concert with any third party who is also Acting in Concert with such other person;

(B) "***Associated Person***" shall mean with respect to any subject stockholder or other person (including any proposed nominee) (1) any person directly or indirectly controlling, controlled by or under common control with such stockholder or other person, (2) any beneficial owner of shares of stock of the Corporation owned of record or beneficially by such stockholder or other person, (3) any associate (as defined in Rule 405 under the Securities Act of 1933, as amended), of such stockholder or other person, and (4) any person directly or indirectly controlling, controlled by or under common control or Acting in Concert with any such Associated Person;

(C) "***Proposing Person***" shall mean (1) the stockholder providing the notice of business proposed to be brought before an annual meeting or nomination of persons for election to the Board at a stockholder meeting, (2) the beneficial owner or beneficial owners, if different, on whose behalf the notice of business proposed to be brought before the annual meeting or nomination of persons for election to the Board at a stockholder meeting is made, and (3) any Associated Person on whose behalf the notice of business proposed to be brought before the annual meeting or nomination of persons for election to the Board at a stockholder meeting is made;

(D) "***Public Announcement***" shall mean disclosure in a press release reported by a national news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Exchange Act; and

(E) to be considered a "***Qualified Representative***" of a stockholder, a person must be a duly authorized officer, manager, trustee or partner of such stockholder or must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as a proxy at the meeting of stockholders and such person must produce such writing or electronic transmission, or a reliable reproduction thereof, at the meeting. The Secretary of the Corporation, or any other person who shall be appointed to serve as secretary of the meeting, may require, on behalf of the Corporation, reasonable and appropriate documentation to verify the status of a person purporting to be a "Qualified Representative" for purposes hereof.

ARTICLE II: BOARD OF DIRECTORS

Section 2.1: Number; Qualifications

The total number of authorized directors constituting the Board (the "***Whole Board***") shall be fixed from time to time in the manner set forth in the Certificate of Incorporation. No decrease in the authorized number of directors constituting the Whole Board shall shorten the term of any incumbent director. Directors need not be stockholders of the Corporation.

Section 2.2: Election; Resignation; Removal; Vacancies

Election of directors need not be by written ballot. Unless otherwise provided by the Certificate of Incorporation and subject to the special rights of the holders of one or more series of Preferred Stock to elect additional directors under specified circumstances, the directors shall be divided, with respect to the time for which they severally hold office, into three classes, designated as Class I, Class II and Class III, respectively. The number of directors in each class shall be divided as nearly equal as reasonably possible. Each director shall hold office until the annual meeting at which such director's term expires and until such director's successor is elected and qualified or until such director's earlier death, resignation, disqualification or removal. Any director may resign by delivering a resignation in writing or by electronic transmission to the Corporation at its principal office or to the Chairperson of the Board, the Chief Executive Officer, or the Secretary. Such resignation shall be effective upon delivery unless it is specified to be effective at a later time or upon the happening of an event. Subject to the special rights of holders of any series of Preferred Stock to elect directors, directors may be removed only as provided by the Certificate of Incorporation and applicable law. All vacancies occurring in the Board and any newly created directorships resulting from any increase in the authorized number of directors shall be filled in the manner set forth in the Certificate of Incorporation.

Section 2.3: Regular Meetings

Regular meetings of the Board may be held at such places, within or without the State of Delaware, and at such times as the Board may from time to time determine. Notice of regular meetings need not be given if the date, times and places thereof are fixed by resolution of the Board.

Section 2.4: Special Meetings

Special meetings of the Board may be called by the Chairperson of the Board, the Chief Executive Officer, the Lead Independent Director or a majority of the members of the Board then in office and may be held at any time, date or place, within or without the State of Delaware, as the person or persons calling the meeting shall fix. Notice of the time, date and place of such meeting shall be given, orally, in writing or by electronic transmission (including electronic mail), by the person or persons calling the meeting to all directors at least four (4) days before the meeting if the notice is mailed, or at least twenty-four (24) hours before the meeting if such notice is given by telephone, hand delivery, telegram, telex, mailgram, facsimile, electronic mail or other means of electronic transmission. Unless otherwise indicated in the notice, any and all business may be transacted at a special meeting.

Section 2.5: Remote Meetings Permitted

Members of the Board, or any committee of the Board, may participate in a meeting of the Board or such committee by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation in a meeting pursuant to conference telephone or other communications equipment shall constitute presence in person at such meeting.

Section 2.6: Quorum; Vote Required for Action

At all meetings of the Board, a majority of the Whole Board shall constitute a quorum for the transaction of business. If a quorum shall fail to attend any meeting, a majority of those present may adjourn the meeting to another place, date or time. Except as otherwise provided herein or in the Certificate of Incorporation, or required by law, the vote of a majority of the directors present at a meeting at which a quorum is present shall be the act of the Board.

Section 2.7: Organization

Meetings of the Board shall be presided over by (a) the Chairperson of the Board, or (b) in the absence of such person, the Lead Independent Director, or (c) in such person's absence, by the Chief Executive Officer, or (d) in such person's absence, by a chairperson chosen by the Board at the meeting. The Secretary shall act as secretary of the meeting, but in such person's absence the chairperson of the meeting may appoint any person to act as secretary of the meeting.

Section 2.8: Unanimous Action by Directors in Lieu of a Meeting

Any action required or permitted to be taken at any meeting of the Board, or of any committee thereof, may be taken without a meeting if all members of the Board or such committee, as the case may be, consent thereto in writing or by electronic transmission, and the writing or writings or electronic transmission or transmissions are filed with the minutes of proceedings of the Board or committee, respectively, in the minute books of the Corporation. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

Section 2.9: Powers

Except as otherwise provided by the Certificate of Incorporation or the DGCL, the business and affairs of the Corporation shall be managed by or under the direction of the Board.

Section 2.10: Compensation of Directors

Members of the Board, as such, may receive, pursuant to a resolution of the Board, fees and other compensation for their services as directors, including without limitation their services as members of committees of the Board.

Section 2.11: Confidentiality

Each director shall maintain the confidentiality of, and shall not share with any third party person or entity (including third parties that originally sponsored, nominated or designated such director (the "***Sponsoring Party***")), any non-public information learned in their capacities as directors, including communications among Board members in their capacities as directors. The Board may adopt a board confidentiality policy further implementing and interpreting this bylaw (a "***Board Confidentiality Policy***"). All directors are required to comply with this bylaw and any such Board Confidentiality Policy unless such director or the Sponsoring Party for such director has entered into a specific written agreement with the Corporation, in either case as approved by the Board, providing otherwise with respect to such confidential information.

ARTICLE III: COMMITTEES

Section 3.1: Committees

The Board may designate one or more committees, each committee to consist of one or more of the directors of the Corporation. The Board may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of a member of the committee, the member or members thereof present at any meeting of such committee who are not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board to act at the meeting in place of any such absent or disqualified member. Any such committee, to the extent provided in a resolution of the Board, shall have and may exercise all the powers and authority of the Board in the management of the business and affairs of the Corporation and may authorize the seal of the Corporation to be affixed to all papers that may require it; but no such committee shall have the power or authority in reference to the following matters: (a) approving, adopting, or recommending to the stockholders any action or matter (other than the election or removal of members of the Board) expressly required by the DGCL to be submitted to stockholders for approval or (b) adopting, amending or repealing any bylaw of the Corporation.

Section 3.2: Committee Rules

Each committee shall keep records of its proceedings and make such reports as the Board may from time to time request. Unless the Board otherwise provides, each committee designated by the Board may make, alter and repeal rules for the conduct of its business. In the absence of such rules, each committee shall conduct its business in the same manner as the Board conducts

its business pursuant to Article II of these Bylaws. Except as otherwise provided in the Certificate of Incorporation, these Bylaws or the resolution of the Board designating the committee, any committee may create one or more subcommittees, each subcommittee to consist of one or more members of the committee, and may delegate to any such subcommittee any or all of the powers and authority of the committee.

ARTICLE IV: OFFICERS; CHAIRPERSON; LEAD INDEPENDENT DIRECTOR

Section 4.1: Generally

The officers of the Corporation shall consist of a Chief Executive Officer (who may be the Chairperson of the Board or the President), a President, a Secretary and a Treasurer and may consist of such other officers, including, without limitation, a Chief Financial Officer, and one or more Vice Presidents, as may from time to time be appointed by the Board. All officers shall be elected by the Board; *provided*, *however*, that the Board may empower the Chief Executive Officer of the Corporation to appoint any officer other than the Chief Executive Officer, the President, the Chief Financial Officer or the Treasurer. Except as otherwise provided by law, by the Certificate of Incorporation or these Bylaws, each officer shall hold office until such officer's successor is duly elected and qualified or until such officer's earlier resignation, death, disqualification or removal. Any number of offices may be held by the same person. Any officer may resign by delivering a resignation in writing or by electronic transmission to the Corporation at its principal office or to the Chairperson of the Board, the Chief Executive Officer, or the Secretary. Such resignation shall be effective upon delivery unless it is specified to be effective at some later time or upon the happening of some later event. Any vacancy occurring in any office of the Corporation by death, resignation, removal or otherwise may be filled by the Board and the Board may, in its discretion, leave unfilled, for such period as it may determine, any offices. Each such successor shall hold office for the unexpired term of such officer's predecessor and until a successor is duly elected and qualified or until such officer's earlier resignation, death, disqualification or removal.

Section 4.2: Chief Executive Officer

Subject to the control of the Board and such supervisory powers, if any, as may be given by the Board, the powers and duties of the Chief Executive Officer of the Corporation are:

(a) to act as the general manager and, subject to the control of the Board, to have general supervision, direction and control of the business and affairs of the Corporation;

(b) subject to Article I, Section 1.6 of these Bylaws, to preside at all meetings of the stockholders;

(c) subject to Article I, Section 1.2 of these Bylaws, to call special meetings of the stockholders to be held at such times and, subject to the limitations prescribed by law or by these Bylaws, at such places as he or she shall deem proper;

(d) to affix the signature of the Corporation to all deeds, conveyances, mortgages, guarantees, leases, obligations, bonds, certificates and other papers and instruments in writing which have been authorized by the Board or which, in the judgment of the Chief Executive Officer, should be executed on behalf of the Corporation; to sign certificates for shares of stock of the Corporation (if any); and, subject to the direction of the Board, to have general charge of the property of the Corporation and to supervise and control all officers, agents and employees of the Corporation; and

(e) to vote and otherwise act on, or to authorize any officer to vote or otherwise act on, on behalf of the Corporation, in person or by proxy, at any meeting of stockholders of or with respect to any action of stockholders of any other corporation in which this Corporation may hold securities and otherwise to exercise, or authorize any officer otherwise to exercise, any and all rights and powers which this Corporation may possess by reason of its ownership of securities in such other corporation.

The person holding the office of President shall be the Chief Executive Officer of the Corporation unless the Board shall designate another officer to be the Chief Executive Officer. If there is no President, and the Board has not designated any other officer to be the Chief Executive Officer, then the Chairperson of the Board shall be the Chief Executive Officer.

Section 4.3: Chairperson of the Board

Subject to the provisions of Section 2.7 of these Bylaws, the Chairperson of the Board shall have the power to preside at all meetings of the Board and shall have such other powers and duties as provided in these Bylaws and as the Board may from time to time prescribe.

Section 4.4: Lead Independent Director

The Board may, in its discretion, elect a lead independent director from among its members that are Independent Directors (as defined below) (such director, the "***Lead Independent Director***"). The Lead Independent Director shall preside at all meetings at which the Chairperson of the Board is not present and shall exercise such other powers and duties as may from time to time be assigned to him or her by the Board or as prescribed by these Bylaws. For purposes of these Bylaws, "***Independent Director***" has the meaning ascribed to such term under the rules of the exchange upon which the Corporation's Common Stock is primarily traded.

Section 4.5: President

The person holding the office of Chief Executive Officer shall be the President of the Corporation unless the Board shall have designated one individual as the President and a different individual as the Chief Executive Officer of the Corporation. Subject to the provisions of these Bylaws and to the direction of the Board, and subject to the supervisory powers of the Chief Executive Officer (if the Chief Executive Officer is an officer other than the President), and subject to such supervisory powers and authority as may be given by the Board to the Chairperson of the Board, and/or to any other officer, the President shall have the responsibility for the general management and control of the business and affairs of the Corporation and the general supervision and direction of all of the officers, employees and agents of the Corporation (other than the Chief Executive Officer, if the Chief Executive Officer is an officer other than the President) and shall perform all duties and have all powers that are commonly incident to the office of President or that are delegated to the President by the Board.

Section 4.6: Chief Financial Officer

The person holding the office of Chief Financial Officer shall be the Treasurer of the Corporation unless the Board shall have designated another officer as the Treasurer of the Corporation. Subject to the direction of the Board and the Chief Executive Officer, the Chief Financial Officer shall perform all duties and have all powers that are commonly incident to the office of Chief Financial Officer, or as the Board may from time to time prescribe.

Section 4.7: Treasurer

The person holding the office of Treasurer shall have custody of all monies and securities of the Corporation. The Treasurer shall make such disbursements of the funds of the Corporation as are authorized and shall render from time to time an account of all such transactions. The Treasurer shall also perform such other duties and have such other powers as are commonly incident to the office of Treasurer, or as the Board or the Chief Executive Officer may from time to time prescribe.

Section 4.8: Vice President

Each Vice President shall have all such powers and duties as are commonly incident to the office of Vice President or that are delegated to him or her by the Board or the Chief Executive Officer. A Vice President may be designated by the Board to perform the duties and exercise the powers of the Chief Executive Officer or President in the event of the Chief Executive Officer's or President's absence or disability.

Section 4.9: Secretary

The Secretary shall issue or cause to be issued all authorized notices for, and shall keep, or cause to be kept, minutes of all meetings of the stockholders and the Board. The Secretary shall have charge of the corporate minute books and similar records and shall perform such other duties and have such other powers as are commonly incident to the office of Secretary, or as the Board or the Chief Executive Officer may from time to time prescribe.

Section 4.10: Delegation of Authority

The Board may from time to time delegate the powers or duties of any officer of the Corporation to any other officers or agents of the Corporation, notwithstanding any provision hereof.

Section 4.11: Removal

Any officer of the Corporation shall serve at the pleasure of the Board and may be removed at any time, with or without cause, by the Board; *provided* that if the Board has empowered the Chief Executive Officer to appoint any officer of the Corporation, then such officer may also be removed by the Chief Executive Officer. Such removal shall be without prejudice to the contractual rights of such officer, if any, with the Corporation.

ARTICLE V: STOCK

Section 5.1: Certificates; Uncertificated Shares

The shares of capital stock of the Corporation shall be uncertificated shares; *provided*, *however*, that the resolution of the Board that the shares of capital stock of the Corporation shall be uncertificated shares shall not apply to shares represented by a certificate until such certificate is surrendered to the Corporation (or the transfer agent or registrar, as the case may be). Notwithstanding the foregoing, the Board may provide by resolution or resolutions that some or

all of any or all classes or series of its stock shall be certificated shares. Every holder of stock represented by certificates shall be entitled to have a certificate signed by, or in the name of the Corporation, by any two authorized officers of the Corporation (it being understood that each of the Chairperson of the Board, the Vice-Chairperson of the Board, the Chief Executive Officer, the President, any Vice President, the Treasurer, any Assistant Treasurer, the Secretary and any Assistant Secretary shall be an authorized officer for such purpose), representing the number of shares registered in certificate form. Any or all of the signatures on the certificate may be a facsimile. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed upon a certificate shall have ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the Corporation with the same effect as if such person were an officer, transfer agent or registrar at the date of issue.

Section 5.2: Lost, Stolen or Destroyed Stock Certificates; Issuance of New Certificates or Uncertificated Shares

The Corporation may issue a new certificate of stock or uncertificated shares in the place of any certificate previously issued by it, alleged to have been lost, stolen or destroyed, upon the making of an affidavit of that fact by the person claiming the certificate of stock to be lost, stolen or destroyed, and the Corporation may require the owner of the lost, stolen or destroyed certificate, or such owner's legal representative, to agree to indemnify the Corporation and/or to give the Corporation a bond sufficient to indemnify it, against any claim that may be made against it on account of the alleged loss, theft or destruction of any such certificate or the issuance of such new certificate or uncertificated shares.

Section 5.3: Other Regulations

Subject to applicable law, the Certificate of Incorporation and these Bylaws, the issue, transfer, conversion and registration of shares represented by certificates and of uncertificated shares shall be governed by such other regulations as the Board may establish.

ARTICLE VI: INDEMNIFICATION

Section 6.1: Indemnification of Officers and Directors

Each person who was or is made a party to, or is threatened to be made a party to, or is involved in any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative, investigative, legislative or any other type whatsoever (a "***Proceeding***"), by reason of the fact that such person (or a person of whom such person is the legal representative), is or was a director or officer of the Corporation, while serving as a director or officer of the Corporation or, is or was serving at the request of the Corporation as a director, officer, employee, agent or trustee of another corporation, or of a partnership, joint venture, trust or other enterprise, including service with respect to employee benefit plans (for purposes of this Article VI, an "***Indemnitee***"), shall be indemnified and held harmless by the Corporation to the fullest extent permitted by the DGCL as the same exists or may hereafter be amended (but, in the case of any such amendment, only to the extent that such amendment permits the Corporation to provide broader indemnification rights than such law permitted the Corporation to provide prior to such amendment), against all expenses, liability and loss (including attorneys' fees, judgments, fines, ERISA excise taxes and penalties and amounts paid or to be paid in settlement) reasonably incurred

or suffered by such Indemnitee in connection therewith, provided such Indemnitee acted in good faith and in a manner that the Indemnitee reasonably believed to be in or not opposed to the best interests of the Corporation, and, with respect to any criminal Proceeding, had no reasonable cause to believe the Indemnitee's conduct was unlawful. Such indemnification shall continue as to an Indemnitee who has ceased to be a director or officer of the Corporation and shall inure to the benefit of such Indemnitees' heirs, executors and administrators. Notwithstanding the foregoing, subject to Section 6.5 of these Bylaws, the Corporation shall indemnify any such Indemnitee seeking indemnity in connection with a Proceeding (or part thereof) initiated by such Indemnitee only if such Proceeding (or part thereof) was authorized by the Board or such indemnification is authorized by an agreement approved by the Board.

Section 6.2: Advancement of Expenses

Except as otherwise provided in a written indemnification agreement between the Corporation and an Indemnitee upon written request, the Corporation shall pay all expenses (including attorneys' fees) incurred by an Indemnitee in defending any Proceeding as they are incurred in advance of its final disposition; provided, however, that if the DGCL then so requires, the advancement of such expenses shall be made only upon delivery to the Corporation of an undertaking, by or on behalf of such Indemnitee, to repay such amounts if it shall ultimately be determined by final judicial decision from which there is no appeal that such Indemnitee is not entitled to be indemnified under this Article VI or otherwise. Such expenses (including attorneys' fees) incurred by former directors and officers or other employees and agents of the Corporation or by persons serving at the request of the Corporation as directors, officers, employees or agents of another corporation, partnership, joint venture, trust or other enterprise may be so paid upon such terms and conditions, if any, as the Corporation deems appropriate. The right to advancement of expenses shall not apply to any claim for which indemnity is excluded pursuant to these Bylaws, but shall apply to any Proceeding referenced in Section 6.1 prior to a determination that the person is not entitled to be indemnified by the Corporation.

Section 6.3: Non-Exclusivity of Rights

The rights conferred on any person in this Article VI shall not be exclusive of any other right that such person may have or hereafter acquire under any statute, provision of the Certificate of Incorporation, Bylaws, agreement, vote or consent of stockholders or disinterested directors, or otherwise. Additionally, nothing in this Article VI shall limit the ability of the Corporation, in its discretion, to indemnify or advance expenses to persons whom the Corporation is not obligated to indemnify or advance expenses pursuant to this Article VI.

Section 6.4: Indemnification Contracts

The Board is authorized to cause the Corporation to enter into indemnification contracts with any director, officer, employee or agent of the Corporation, or any person serving at the request of the Corporation as a director, officer, employee, agent or trustee of another corporation, partnership, joint venture, trust or other enterprise, including employee benefit plans, providing indemnification or advancement rights to such person. Such rights may be greater than those provided in this Article VI.

Section 6.5: Right of Indemnitee to Bring Suit

The following shall apply to the extent not in conflict with any indemnification contract provided for in Section 6.4 of these Bylaws.

6.5.1 Right to Bring Suit. If a claim under Section 6.1 or 6.2 of these Bylaws is not paid in full by the Corporation within sixty (60) days after a written claim has been received by the Corporation, except in the case of a claim for an advancement of expenses, in which case the applicable period shall be twenty (20) days, the Indemnitee may at any time thereafter bring suit against the Corporation to recover the unpaid amount of the claim. If successful in whole or in part in any such suit, or in a suit brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Indemnitee shall be entitled to be paid, to the fullest extent permitted by law, the expense of prosecuting or defending such suit. In (a) any suit brought by the Indemnitee to enforce a right to indemnification hereunder (but not in a suit brought by the Indemnitee to enforce a right to an advancement of expenses) it shall be a defense that, and (b) in any suit brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Corporation shall be entitled to recover such expenses upon a final adjudication that, the Indemnitee has not met any applicable standard for indemnification set forth in applicable law.

6.5.2 Effect of Determination. Neither the absence of a determination prior to the commencement of such suit that indemnification of the Indemnitee is proper in the circumstances because the Indemnitee has met the applicable standard of conduct set forth in applicable law, nor an actual determination that the Indemnitee has not met such applicable standard of conduct, shall create a presumption that the Indemnitee has not met the applicable standard of conduct or, in the case of such a suit brought by the Indemnitee, be a defense to such suit.

6.5.3 Burden of Proof. In any suit brought by the Indemnitee to enforce a right to indemnification or to an advancement of expenses hereunder, or brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the burden of proving that the Indemnitee is not entitled to be indemnified, or to such advancement of expenses, under this Article VI, or otherwise, shall be on the Corporation.

Section 6.6: Nature of Rights

The rights conferred upon Indemnitees in this Article VI shall be contract rights and such rights shall continue as to an Indemnitee who has ceased to be a director, officer or trustee and shall inure to the benefit of the Indemnitee's heirs, executors and administrators. Any amendment, repeal or modification of any provision of this Article VI that adversely affects any right of an Indemnitee or an Indemnitee's successors shall be prospective only, and shall not adversely affect any right or protection conferred on a person pursuant to this Article VI with respect to any Proceeding involving any occurrence or alleged occurrence of any action or omission to act that took place prior to such amendment, repeal or modification.

Section 6.7: Insurance

The Corporation may purchase and maintain insurance, at its expense, to protect itself and any director, officer, employee or agent of the Corporation or another corporation, partnership, joint venture, trust or other enterprise against any expense, liability or loss asserted against such person and incurred by such person in any such capacity, or arising out of such person's status as such, whether or not the Corporation would have the power to indemnify such person against such expense, liability or loss under the DGCL.

ARTICLE VII: NOTICES

Section 7.1: Notice

7.1.1 Form and Delivery. Except as otherwise specifically required in these Bylaws (including, without limitation, Section 7.1.2 of these Bylaws) or by applicable law, all notices required to be given pursuant to these Bylaws shall be in writing and may (a) in every instance in connection with any delivery to a member of the Board, be effectively given by hand delivery (including use of a delivery service), by depositing such notice in the mail, postage prepaid, or by sending such notice by overnight express courier, facsimile, electronic mail or other form of electronic transmission and (b) be effectively delivered to a stockholder when given by hand delivery, by depositing such notice in the mail, postage prepaid or, if specifically consented to by the stockholder as described in Section 7.1.2 of these Bylaws, by sending such notice by facsimile, electronic mail or other form of electronic transmission. Any such notice shall be addressed to the person to whom notice is to be given at such person's address as it appears on the records of the Corporation. The notice shall be deemed given (a) in the case of hand delivery, when received by the person to whom notice is to be given or by any person accepting such notice on behalf of such person, (b) in the case of delivery by mail, upon deposit in the mail, (c) in the case of delivery by overnight express courier, when dispatched, and (d) in the case of delivery via facsimile, electronic mail or other form of electronic transmission, at the time provided in Section 7.1.2 of these Bylaws.

7.1.2 Electronic Transmission. Without limiting the manner by which notice otherwise may be given effectively to stockholders, any notice to stockholders given by the Corporation under any provision of the DGCL, the Certificate of Incorporation, or these Bylaws shall be effective if given by a form of electronic transmission consented to by the stockholder to whom the notice is given in accordance with Section 232 of the DGCL. Any such consent shall be revocable by the stockholder by written notice to the Corporation. Any such consent shall be deemed revoked if (a) the Corporation is unable to deliver by electronic transmission two consecutive notices given by the Corporation in accordance with such consent and (b) such inability becomes known to the Secretary or an Assistant Secretary of the Corporation or to the transfer agent, or other person responsible for the giving of notice; *provided*, *however*, the inadvertent failure to treat such inability as a revocation shall not invalidate any meeting or other action. Notice given pursuant to this Section 7.1.2 shall be deemed given: (i) if by facsimile telecommunication, when directed to a number at which the stockholder has consented to receive notice; (ii) if by electronic mail, when directed to an electronic mail address at which the stockholder has consented to receive notice; (iii) if by a posting on an electronic network together with separate notice to the stockholder of such specific posting, upon the later of such posting and the giving of such separate notice; and (iv) if by any other form of electronic transmission, when directed to the stockholder.

7.1.3 Affidavit of Giving Notice. An affidavit of the Secretary or an Assistant Secretary or of the transfer agent or other agent of the Corporation that the notice has been given in writing or by a form of electronic transmission shall, in the absence of fraud, be prima facie evidence of the facts stated therein.

Section 7.2: Waiver of Notice

Whenever notice is required to be given under any provision of the DGCL, the Certificate of Incorporation or these Bylaws, a written waiver of notice, signed by the person entitled to notice, or waiver by electronic transmission by such person, whether before or after the time stated therein, shall be deemed equivalent to notice. Attendance of a person at a meeting shall constitute a waiver of notice of such meeting, except when the person attends a meeting for the express purpose of objecting at the beginning of the meeting to the transaction of any business because the meeting is not lawfully called or convened. Neither the business to be transacted at, nor the purpose of, any regular or special meeting of the stockholders, directors or members of a committee of directors need be specified in any waiver of notice.

ARTICLE VIII: INTERESTED DIRECTORS

Section 8.1: Interested Directors

No contract or transaction between the Corporation and one or more of its members of the Board or officers, or between the Corporation and any other corporation, partnership, association or other organization in which one or more of its directors or officers are members of the board of directors or officers, or have a financial interest, shall be void or voidable solely for this reason, or solely because the director or officer is present at or participates in the meeting of the Board or committee thereof that authorizes the contract or transaction, or solely because his, her or their votes are counted for such purpose, if: (a) the material facts as to his, her or their relationship or interest and as to the contract or transaction are disclosed or are known to the Board or the committee, and the Board or committee in good faith authorizes the contract or transaction by the affirmative votes of a majority of the disinterested directors, even though the disinterested directors be less than a quorum; (b) the material facts as to his, her or their relationship or interest and as to the contract or transaction are disclosed or are known to the stockholders entitled to vote thereon, and the contract or transaction is specifically approved in good faith by vote of the stockholders; or (c) the contract or transaction is fair as to the Corporation as of the time it is authorized, approved or ratified by the Board, a committee thereof, or the stockholders.

Section 8.2: Quorum

Interested directors may be counted in determining the presence of a quorum at a meeting of the Board or of a committee which authorizes the contract or transaction.

ARTICLE IX: MISCELLANEOUS

Section 9.1: Fiscal Year

The fiscal year of the Corporation shall be determined by resolution of the Board.

Section 9.2: Seal

The Board may provide for a corporate seal, which may have the name of the Corporation inscribed thereon and shall otherwise be in such form as may be approved from time to time by the Board.

Section 9.3: Form of Records

Any records administered by or on behalf of the Corporation in the regular course of its business, including its stock ledger, books of account and minute books, may be kept on or by means of, or be in the form of, any other information storage device, method or one or more electronic networks or databases (including one or more distributed electronic networks or databases), electronic or otherwise, *provided* that the records so kept can be converted into clearly legible paper form within a reasonable time and otherwise comply with the DGCL. The Corporation shall so convert any records so kept upon the request of any person entitled to inspect such records pursuant to any provision of the DGCL.

Section 9.4: Reliance upon Books, Records and Experts

A member of the Board, or a member of any committee designated by the Board shall, in the performance of such person's duties, be fully protected in relying in good faith upon the books and records of the Corporation and upon such information, opinions, reports or statements presented to the Corporation by any of the Corporation's officers or employees, or committees of the Board, or by any other person as to matters the member reasonably believes are within such other person's professional or expert competence and who has been selected with reasonable care by or on behalf of the Corporation.

Section 9.5: Certificate of Incorporation Governs

In the event of any conflict between the provisions of the Certificate of Incorporation and Bylaws, the provisions of the Certificate of Incorporation shall govern.

Section 9.6: Severability

If any provision of these Bylaws shall be held to be invalid, illegal, unenforceable or in conflict with the provisions of the Certificate of Incorporation, then such provision shall nonetheless be enforced to the maximum extent possible consistent with such holding and the remaining provisions of these Bylaws (including without limitation, all portions of any section of these Bylaws containing any such provision held to be invalid, illegal, unenforceable or in conflict with the Certificate of Incorporation, that are not themselves invalid, illegal, unenforceable or in conflict with the Certificate of Incorporation) shall remain in full force and effect.

Section 9.7: Time Periods

In applying any provision of these Bylaws which requires that an act be done or not be done a specified number of days prior to an event or that an act be done during a period of a specified number of days prior to an event, calendar days shall be used, the day of the doing of the act shall be excluded, and the day of the event shall be included.

ARTICLE X: AMENDMENT

Notwithstanding any other provision of these Bylaws, any alteration, amendment or repeal of these Bylaws, and any adoption of new Bylaws, shall require the approval of the Board or the stockholders of the Corporation as expressly provided in the Certificate of Incorporation.

ARTICLE XI: EXCLUSIVE FORUM

Unless the Corporation consents in writing to the selection of an alternative forum, the federal district courts of the United States of America shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act of 1933, as amended.

Any person or entity purchasing or otherwise acquiring any interest in any security of the corporation shall be deemed to have notice of and consented to the provisions of this Article XI.

CERTIFICATION OF RESTATED BYLAWS
OF
SUTRO BIOPHARMA, INC.
(a Delaware corporation)

I, Edward Albini, certify that I am Secretary of Sutro Biopharma, Inc., a Delaware corporation (the "***Corporation***"), that I am duly authorized to make and deliver this certification, that the attached Bylaws are a true and complete copy of the Restated Bylaws of the Corporation in effect as of the date of this certificate.

Dated: October 1, 2018

/s/ Edward Albini
Chief Financial Officer and Secretary

Exhibit 10.8

FIRST AMENDMENT TO
LOAN AND SECURITY AGREEMENT

THIS FIRST AMENDMENT TO LOAN AND SECURITY AGREEMENT (this "**Amendment**") is entered into as of December 5, 2018, by and among OXFORD FINANCE LLC, a Delaware limited liability company with an office located at 133 North Fairfax Street, Alexandria, Virginia 22314, as collateral agent (in its individual capacity, "**Oxford**"; and in its capacity as collateral agent, "**Collateral Agent**"), the Lenders listed on Schedule 1.1 of the Loan Agreement (as defined below) or otherwise party thereto from time to time including Oxford in its capacity as a Lender and SILICON VALLEY BANK, a California corporation with an office located at 3003 Tasman Drive, Santa Clara, CA 95054 ("**Bank**" or "**SVB**") (each a "**Lender**" and collectively, the "**Lenders**"), SUTRO BIOPHARMA, INC., a Delaware corporation with offices located at 310 Utah Street, Suite 150, South San Francisco, CA 94080 ("**Borrower**").

RECITALS

WHEREAS, Collateral Agent, Borrower and the Lenders party thereto from time to time have entered into that certain Loan and Security Agreement, dated as of August 4, 2017 (as amended, supplemented or otherwise modified from time to time, the "**Loan Agreement**") pursuant to which the Lenders have provided to Borrower certain loans in accordance with the terms and conditions thereof; and

NOW, THEREFORE, in consideration of the promises, covenants and agreements contained herein, and other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, Borrower, the Lenders and Collateral Agent hereby agree as follows:

1. **Definitions**. Capitalized terms used herein but not otherwise defined shall have the respective meanings given to them in the Loan Agreement.

2. **Amendments.**

2.1 Section 6.2(a)(i) of the Loan Agreement is hereby amended and restated as follows:

"(i) as soon as available, but no later than forty (40) days after the last day of eachquarter, a company prepared consolidated and consolidating balance sheet, income statement andcash flow statement covering the consolidated operations of Borrower and its Subsidiaries for such quarter certified by a Responsible Officer as being fairly stated in all material respects (subject to normal year-end GAAP and audit adjustments and the absence of footnotes) and in a form reasonably acceptable to Collateral Agent;"

2.2 Section 6.2(b) of the Loan Agreement is hereby amended and restated as follows:

"(b) within thirty (30) days after the last day of each month, deliver to each Lender, a duly completed Compliance Certificate signed by a Responsible Officer."

2.3 Exhibit C to the Loan Agreement is hereby amended and restated in the form of Exhibit C attached hereto.

3. **Limitation of Amendment.**

3.1 The amendments set forth in **Section 2** above are effective for the purposes set forth herein and shall be limited precisely as written and shall not be deemed to (a) be a consent to any amendment, waiver or modification of any other term or condition of any Loan Document, or (b) otherwise prejudice any right, remedy or obligation which Collateral Agent or any Lender or Borrower may now have or may have in the future under or in connection with any Loan Document, as amended hereby.

3.2 This Amendment shall be construed in connection with and as part of the Loan Documents and all terms, conditions, representations, warranties, covenants and agreements set forth in the Loan Documents, except as herein amended, are hereby ratified and confirmed and shall remain in full force and effect.

4. Representations and Warranties. To induce Collateral Agent and the Lenders to enter into this Amendment, Borrower hereby represents and warrants to Collateral Agent and Lenders as follows:

4.1 Immediately after giving effect to this Amendment (a) the representations and warranties contained in the Loan Documents are true, accurate and complete in all material respects as of the date hereof (except to the extent such representations and warranties relate to an earlier date, in which case they are true and correct as of such date), and (b) no Event of Default has occurred and is continuing;

4.2 Borrower has the power and due authority to execute and deliver this Amendment and to perform its obligations under the Loan Agreement, as amended by this Amendment;

4.3 The Restated Certificate of Incorporation of the Borrower and Restated Bylaws of the Borrower filed as Exhibit 3.1 and Exhibit 3.2 to the Borrower's Form 10-Q for the quarterly period ended September 30, 2018, filed with the SEC on November 14, 2018 are true, accurate and complete and have not been further amended, supplemented or restated and are and continue to be in full force and effect;

4.4 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, have been duly authorized;

4.5 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not and will not contravene (a) any law or regulation binding on or affecting Borrower, (b) any contractual restriction with a Person binding on Borrower, (c) any order, judgment or decree of any court or other governmental or public body or authority, or subdivision thereof, binding on Borrower, or (d) the organizational documents of Borrower;

4.6 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not require any order, consent, approval, license, authorization or validation of, or filing, recording or registration with, or exemption by any governmental or public body or authority, or subdivision thereof, binding on Borrower, except as already has been obtained or made; and

4.7 This Amendment has been duly executed and delivered by Borrower and is the binding obligation of Borrower, enforceable against Borrower in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, liquidation, moratorium or other similar laws of general application and equitable principles relating to or affecting creditors' rights.

5. Release by Borrower.

5.1 FOR GOOD AND VALUABLE CONSIDERATION, Borrower hereby forever relieves, releases, and discharges Collateral Agent and the Lenders and their present or former employees, officers, directors, agents, representatives, attorneys, and each of them, from any and all claims, debts, liabilities, demands, obligations, promises, acts, agreements, costs and expenses, actions and causes of action, of every type, kind, nature, description or character whatsoever, whether known or unknown, suspected or unsuspected, absolute or contingent, arising out of or in any manner whatsoever connected with or related to facts, circumstances, issues, controversies or claims existing or arising from the beginning of time through and including the date of execution of this Amendment (collectively "Released Claims"). Without limiting the foregoing, the Released Claims shall include any and all liabilities or claims arising out of or in any manner whatsoever connected with or related to the Loan Documents, the Recitals hereto, any instruments, agreements or documents executed in connection with any of the foregoing or the origination, negotiation, administration, servicing and/or enforcement of any of the foregoing.

5.2 In furtherance of this release, Borrower expressly acknowledges and waives any and all rights under Section 1542 of the California Civil Code, which provides as follows:

> "**A general release** does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor." (Emphasis added.)

5.3 By entering into this release, Borrower recognizes that no facts or representations are ever absolutely certain and it may hereafter discover facts in addition to or different from those which it presently knows or believes to be true, but that it is the intention of Borrower hereby to fully, finally and forever settle and release all matters, disputes and differences, known or unknown, suspected or unsuspected; accordingly, if Borrower should subsequently discover that any fact that it relied upon in entering into this release was untrue, or that any understanding of the facts was incorrect, Borrower shall not be entitled to set aside this release by reason thereof, regardless of any claim of mistake of fact or law or any other circumstances whatsoever. Borrower acknowledges that it is not relying upon and has not relied upon any representation or statement made by Collateral Agent or any Lender with respect to the facts underlying this release or with regard to any of such party's rights or asserted rights.

5.4 This release may be pleaded as a full and complete defense and/or as a cross-complaint or counterclaim against any action, suit, or other proceeding that may be instituted, prosecuted or attempted in breach of this release. Borrower acknowledges that the release contained herein constitutes a material inducement to Collateral Agent and the Lenders to enter into this Amendment, and that Collateral Agent and the Lenders would not have done so but for Collateral Agent and the Lenders' expectation that such release is valid and enforceable in all events.

5.5 Borrower hereby represents and warrants to Collateral Agent and the Lenders, and Collateral Agent and the Lenders are relying thereon, as follows:

(a) Except as expressly stated in this Agreement, neither Collateral Agent, the Lenders nor any agent, employee or representative of Collateral Agent or any Lender has made any statement or representation to Borrower regarding any fact relied upon by Borrower in entering into this Amendment.

(b) Borrower has made such investigation of the facts pertaining to this Amendment and all of the matters appertaining thereto, as it deems necessary.

(c) The terms of this Amendment are contractual and not a mere recital.

(d) This Amendment has been carefully read by Borrower, the contents hereof are known and understood by Borrower, and this Amendment is signed freely, and without duress, by Borrower.

(e) Borrower represents and warrants that it is the sole and lawful owner of all right, title and interest in and to every claim and every other matter which it releases herein, and that it has not heretofore assigned or transferred, or purported to assign or transfer, to any person, firm or entity any claims or other matters herein released. Borrower shall indemnify Collateral Agent and the Lenders, defend and hold them harmless from and against all claims based upon or arising in connection with prior assignments or purported assignments or transfers of any claims or matters released herein.

6. Counterparts. This Amendment may be executed in any number of counterparts and all of such counterparts taken together shall be deemed to constitute one and the same instrument.

7. Integration. Except as expressly set forth herein, the Loan Agreement shall continue in full force and effect without alteration or amendment. This Amendment and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements.

8. **Governing Law**. This Amendment and the rights and obligations of the parties hereto shall be governed by and construed in accordance with the laws of the State of California.

9. **Effectiveness.** This Amendment shall be deemed effective upon:

(i) the due execution and delivery to Collateral Agent and the Lenders of this Amendment by each party hereto; and

(ii) Borrower's payment of all Lenders' Expenses incurred through the date hereof, which may be debited (or ACH'd) from any of Borrower's accounts with the Lenders.

[***Balance of Page Intentionally Left Blank***]

IN WITNESS WHEREOF, the parties hereto have caused this First Amendment to Loan and Security Agreement to be duly executed and delivered as of the date first set forth above.

BORROWER:

SUTRO BIOPHARMA, INC.

By /s/ William J. Newell
Name: William J. Newell
Title: CEO

COLLATERAL AGENT AND LENDER:

OXFORD FINANCE LLC

By _____
Name: _____
Title: _____

LENDER:

SILICON VALLEY BANK

By _____
Name: _____
Title: _____

[Signature Page to First Amendment to Loan and Security Agreement]

IN WITNESS WHEREOF, the parties hereto have caused this First Amendment to Loan and Security Agreement to be duly executed and delivered as of the date first set forth above.

BORROWER:

SUTRO BIOPHARMA, INC.

By _____
Name: _____
Title: _____

COLLATERAL AGENT AND LENDER:

OXFORD FINANCE LLC

By _____
Name: _____
Title: _____

LENDER:

SILICON VALLEY BANK

By _____
Name: _____
Title: _____

[Signature Page to First Amendment to Loan and Security Agreement]

IN WITNESS WHEREOF, the parties hereto have caused this First Amendment to Loan and Security Agreement to be duly executed and delivered as of the date first set forth above.

BORROWER:

SUTRO BIOPHARMA, INC.

By _____
Name: _____
Title: _____

COLLATERAL AGENT AND LENDER:

OXFORD FINANCE LLC

By _____
Name: _____
Title: _____

LENDER:

SILICON VALLEY BANK

By _____
Name: _____
Title: _____

[Signature Page to First Amendment to Loan and Security Agreement]

EXHIBIT C

Compliance Certificate

TO: OXFORD FINANCE LLC, as Collateral Agent and Lender
SILICON VALLEY BANK, as Lender

FROM: SUTRO BIOPHARMA, INC.

The undersigned authorized officer ("**Officer**") of Sutro Biopharma, Inc. ("**Borrower**"), hereby certifies that in accordance with the terms and conditions of the Loan and Security Agreement by and among Borrower, Collateral Agent, and the Lenders from time to time party thereto (the "**Loan Agreement**;" capitalized terms used but not otherwise defined herein shall have the meanings given them in the Loan Agreement),

(a) Borrower is in complete compliance for the period ending _____with all required covenants except as noted below;

(b) There are no Events of Default, except as noted below;

(c) Except as noted below, all representations and warranties of Borrower stated in the Loan Documents are true and correct in all material respects on this date and for the period described in (a), above; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date;

(d) Borrower, and each of Borrower's Subsidiaries, has timely filed all required tax returns and reports, Borrower, and each of Borrower's Subsidiaries, has timely paid all foreign, federal, state, and local taxes, assessments, deposits and contributions owed by Borrower, or Subsidiary, except as otherwise permitted pursuant to the terms of Section 5.8 of the Loan Agreement; and

(e) No Liens have been levied or claims made against Borrower or any of its Subsidiaries relating to unpaid employee payroll or benefits of which Borrower has not previously provided written notification to Collateral Agent and the Lenders.

Attached are the required documents, if any, supporting our certification(s). The Officer, on behalf of Borrower, further certifies that the attached financial statements are prepared in accordance with Generally Accepted Accounting Principles (GAAP) and are consistently applied from one period to the next except as explained in an accompanying letter or footnotes and except, in the case of unaudited financial statements, for the absence of footnotes and subject to year-end GAAP and audit adjustments as to the interim financial statements.

Please indicate compliance status since the last Compliance Certificate by circling Yes, No, or N/A under "Complies" column.

	Reporting Covenant	Requirement	Actual	Complies		
1)	Financial statements	Quarterly within 40 days		Yes	No	N/A
2)	Annual (CPA Audited) statements	Within 210 days after FYE (and 12/31/2017 for the Annual (CPA Audited) statements for FYE 2016)		Yes	No	N/A
3)	Annual Financial Projections/Budget (prepared on a monthly basis)	Annually (within 30 days of FYE), and when revised		Yes	No	N/A
4)	A/R & A/P agings	If applicable		Yes	No	N/A
5)	8-K, 10-K and 10-Q Filings	If applicable, within 5 days of filing		Yes	No	N/A

6)	Compliance Certificate	Monthly within 30 days		Yes	No	N/A
7)	IP Report	When required		Yes	No	N/A
8)	Total amount of Borrower's and Borrower's Subsidiaries' unrestricted cash and cash equivalents at the last day of the prior measurement period		$_____	Yes	No	N/A
9)	Net change in Borrower's and Borrower's Subsidiaries' unrestricted cash and cash equivalents since the last day of the prior measurement period		$_____	Yes	No	N/A
10)	Total amount of Borrower's and Borrower's Subsidiaries' unrestricted cash and cash equivalents at the last day of the measurement period		$_____	Yes	No	N/A

Deposit and Securities Accounts
(Please list all accounts; attach separate sheet if additional space needed)

	Institution Name	Account Number	New Account?		Account Control Agreement in place?	
1)			Yes	No	Yes	No
2)			Yes	No	Yes	No
3)			Yes	No	Yes	No
4)			Yes	No	Yes	No

Other Matters

1)	Have there been any changes in management since the last Compliance Certificate?	Yes	No
2)	Have there been any transfers/sales/disposals/retirement of Collateral or IP prohibited by the Loan Agreement?	Yes	No
3)	Have there been any new or pending claims or causes of action against Borrower that involve more than Two Hundred Fifty Thousand Dollars ($250,000.00)?	Yes	No
4)	Have there been any material amendments of or other material changes to the capitalization table of Borrower and any amendments of or other changes to the Operating Documents of Borrower or any of its Subsidiaries? If yes, provide copies of any such amendments or changes with this Compliance Certificate.	Yes	No

Exceptions

Please explain any exceptions with respect to the certification above: (If no exceptions exist, state "No exceptions." Attach separate sheet if additional space needed.)

SUTRO BIOPHARMA, INC.

By _____
Name: _____
Title: _____

Date:

LENDER USE ONLY

Received by: _____ Date _____

Verified by: _____ Date _____

Compliance Status: Yes No

36951810v6

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement (Form S-8 No. 333-227551) pertaining to the 2004 Stock Plan, the 2018 Employee Stock Purchase Plan, and the 2018 Equity Incentive Plan of Sutro Biopharma, Inc. of our report dated March 29, 2019, with respect to the financial statements of Sutro Biopharma, Inc., included in this Annual Report (Form 10-K) for the year ended December 31, 2018.

/s/ Ernst & Young LLP

Redwood City, California
March 29, 2019

Exhibit 24.1

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints William J. Newell and Edward C. Albini and each of them, with full power of substitution and resubstitution, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this Annual Report on Form 10-K and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agents full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorney-in-fact and agents or his substitute or substitutes may lawfully do or cause to be done by virtue thereof. Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

/s/ William J. Newell	President, Chief Executive Officer and Director	March 29, 2019
William J. Newell	*(Principal Executive Officer)*	
/s/ Edward C. Albini	Chief Financial Officer	March 29, 2019
Edward C. Albini	*(Principal Financial and Accounting Officer)*	
/s/ Michael Dybbs, Ph.D.	Director	March 29, 2019
Michael Dybbs, Ph.D.		
/s/ John G. Freund, M.D.	Director	March 29, 2019
John G. Freund, M.D.		
/s/ Daniel Janney	Director	March 29, 2019
Daniel Janney		
/s/ V. Bryan Lawlis, Ph.D.	Director	March 29, 2019
V. Bryan Lawlis, Ph.D.		
/s/ Joseph M. Lobacki	Director	March 29, 2019
Joseph M. Lobacki		
/s/ Daniel H. Petree	Director	March 29, 2019
Daniel H. Petree		
/s/ Michael Ross, Ph.D.	Director	March 29, 2019
Michael Ross, Ph.D.		
/s/ Shalini Sharp	Director	March 29, 2019
Shalini Sharp		

Exhibit 31.1

CERTIFICATION PURSUANT TO RULE 13a-14(a) OR 15d-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, William J. Newell certify that:

1. I have reviewed this Annual Report on Form 10-K of Sutro Biopharma, Inc.;

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 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)) 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. 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

   c. 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;

5. The registrant's other certifying officer 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 29, 2019

/s/ William J. Newell
William J. Newell
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO RULE 13a-14(a) OR 15d-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Edward C. Albini, certify that:

1. I have reviewed this Annual Report on Form 10-K of Sutro Biopharma, Inc.;

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 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)) 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. 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

   c. 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;

5. The registrant's other certifying officer 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 29, 2019

/s/ Edward C. Albini
Edward C. Albini
Chief Financial Officer
(Principal Accounting Officer and 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

I, William J. Newell, Chief Executive Officer of Sutro Biopharma, Inc. (the "Company"), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

1. the Annual Report on Form 10-K of the Company for the fiscal year ended December 31, 2018 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 29, 2019

/s/ William J. Newell
William J. Newell
Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Edward C. Albini, Chief Financial Officer of Sutro Biopharma, Inc. (the "Company"), do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

1. the Annual Report on Form 10-K of the Company for the fiscal year ended December 31, 2018 (the "Report") fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 29, 2019

/s/ Edward C. Albini
Edward C. Albini
Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)