2019 Annual Report

SCHOLAR ROCK

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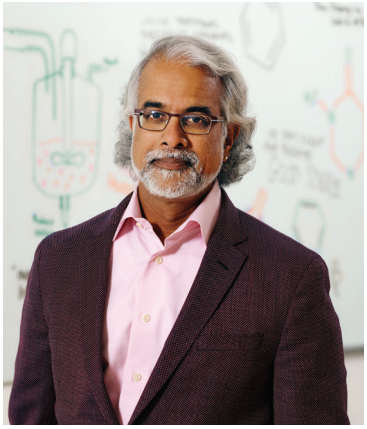
NASDAQ: SRRK



OUR APPROACH

At Scholar Rock, our spirit of inquiry goes beyond traditional therapeutic approaches to uncover enlightened solutions for patients. We work across therapeutic areas – including neuromuscular disorders, cancer, fibrosis, and anemias – and deploy our technology platform to discover new medicines designed to selectively regulate growth factor activity in the local microenvironment of cells and tissues.

2019 PROGRESS

The past 12 months were a time of remarkable progress for Scholar Rock. We rapidly advanced our SRK-015 program in SMA by completing enrollment in the TOPAZ trial in just eight months, accelerated preclinical activities and submitted our IND application for SRK-181 in cancer immunotherapy, and achieved the first milestone in our fibrosis-focused collaboration with Gilead.

To Our Shareholders:

Before I reflect on the past year, I would like to take a moment to speak to the current reality of the COVID-19 pandemic, which has impacted people throughout the world, and has also greatly impacted the entire healthcare sector. We stand in solidarity with our industry peers who are innovating to solve problems on a global scale, including treatments and vaccines for this novel virus. I also take with the utmost seriousness the plans Scholar Rock has implemented to ensure the advancements of our clinical development programs, while protecting the health and safety of our employees, patients and partners.

2019 was a year of strong execution, during which we built significant momentum for the year ahead. We made major strides in advancing our portfolio of product candidates designed to transform the lives of patients affected by a wide range of serious diseases. For each of the diseases we target, signaling by protein growth factors plays a fundamental role and our team has applied unique insights and our proprietary technology platform to develop antibody medicines that locally and selectively target these signaling proteins. In short, our platform has demonstrated its ability to target growth factor-driven diseases and our emerging pipeline of medicines is making sustained progress on the path toward patients.

For our most advanced product candidate, SRK-015, our Phase 2 proof-of-concept trial (TOPAZ) has been in full swing since its initiation in the second quarter of 2019. We are developing SRK-015, a highly specific inhibitor of myostatin activation, for the treatment of patients with Type 2 and Type 3 Spinal Muscular Atrophy (SMA). In late 2019, we reported preliminary pharmacokinetic and pharmacodynamic data from a planned analysis for 29 patients in the TOPAZ trial that showed robust target engagement in patients, providing the first evidence of successful pharmacologic engagement of a latent growth factor in a human disease setting.

Based on our reported results, we continue to believe that SRK-015 has the potential to improve motor function, either as a monotherapy or in conjunction with any SMN upregulator therapy, and our aim is to establish SRK-015 as the first muscle-directed therapy for patients affected by SMA. We look forward to our next clinical milestones for SRK-015 with the anticipated reporting of interim and full 12-month safety and efficacy data from the TOPAZ Phase 2 trial this year and next. We are also evaluating multiple potential opportunities beyond SMA, for which the selective inhibition of the activation of myostatin with SRK-015 may offer a therapeutic benefit for patients.

Our second product candidate, SRK-181, is a potent and highly selective inhibitor of latent transforming growth factor beta 1 (TGFß1) activation, a key signaling protein that has been implicated as a potential point of intervention to overcome primary resistance to checkpoint inhibition in cancer. SRK-181 offers the ability to target the TGFß1 isoform in its latent form for selective and local effect in the tumor microenvironment, which we believe could avoid the dose-limiting cardiotoxicities that have challenged conventional inhibitors of TGFß signaling and offer an improved safety profile. We have built a strong body of preclinical evidence, published in the peer-reviewed journal *Science Translational Medicine*, supporting the clinically-derived rationale for evaluating the central role of TGFß1 in primary resistance to checkpoint inhibitor therapy. Across several mouse tumor models that emulate key features of clinically observed primary resistance, SRK-181 was able to render resistant solid tumors vulnerable to PD-1 blockade and combination treatment was able to drive tumor regression and survival benefit. Preclinical studies also suggest a differentiated safety profile. GLP toxicology studies in rats and non-human primates have shown no adverse effects observed up to the highest evaluated doses, which are well above the doses believed to be necessary to elicit robust anti-tumor responses when combined with anti-PD-1 antibody.

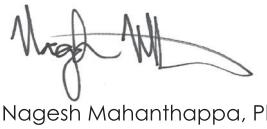
In 2019, we accelerated the preclinical activities for SRK-181, which allowed us to submit an Investigational New Drug (IND) application to the U.S. Food and Drug Administration and initiate a Phase 1 proof-of-concept trial in patients with locally advanced or metastatic solid tumors in the first quarter of 2020. Results from the Phase 1 trial will provide critical insights on SRK-181's safety profile and its potential to meaningfully expand the number of patients who could benefit from checkpoint inhibitors, such as anti-PD-1/anti-PD-L1 therapy.

We have made important advancements in our collaboration with Gilead Sciences, Inc. to develop potent and highly specific inhibitors of TGFß activation for the potential treatment of patients suffering from fibrotic diseases. We achieved our first milestone and a $25 million payment for the successful demonstration of efficacy in preclinical in vivo proof-of-concept studies. We are on our way toward selecting molecules that could be developed by Gilead as new medicines that are much needed for patients with fibrotic diseases.

We continue to make significant progress with our discovery and preclinical programs to give rise to new product candidates. The scope of our earlier pipeline work spans a range of disease areas, including neuromuscular disorders, cancers, fibrosis, and anemias, in which structural insights and growth factors are key in discovering and developing safe and effective therapies.

Our success in 2019 has positioned us well for continued momentum with multiple clinical readouts that offer potential value inflection points in 2020 and beyond. As we progress through 2020 and the ongoing COVID-19 pandemic, we share with you the need and commitment to care for our families, colleagues and communities. I want to thank our shareholders for their continued support and acknowledge our employees for their remarkable enthusiasm and perseverance, even during this time of global uncertainty, as we advance our pipeline of potentially life-changing medicines for patients.

Sincerely,



Nagesh Mahanthappa, PhD, President and CEO of Scholar Rock

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

FORM 10-K

(Mark One)

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

For the Fiscal Year Ended December 31, 2019

OR

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

For the Transition Period from to

Commission File Number: 001-38501

SCHOLAR ROCK HOLDING CORPORATION
(Exact name of Registrant as specified in its charter)

Delaware **(State or Other Jurisdiction of Incorporation or Organization)**		**82-3750435** **(I.R.S. Employer Identification Number)**

620 Memorial Drive, 2nd Floor
Cambridge, MA 02139
(857) 259-3860
(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)

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

Title of each class	**Trading symbol(s)**	**Name of each exchange on which registered**
Common Stock, par value $0.001 per share	SRRK	The Nasdaq Global Select Market

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

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

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

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

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

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

Large Accelerated Filer	☐	Accelerated Filer	☒
Non-accelerated Filer	☐	Smaller Reporting Company	☒
		Emerging growth company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act ☒

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

As of June 28, 2019, the last day of the registrant's most recently completed second fiscal quarter, the aggregate market value of the Common Stock held by non-affiliates of the registrant was approximately $185.1 million based on the closing price of the registrant's common stock on June 28, 2019. The calculation excludes shares of the registrant's common stock held by current executive officers, directors and stockholders that the registrant has concluded are affiliates of the registrant. This determination of affiliate status is not a determination for other purposes.

As of March 1, 2020, there were 29,808,174 shares of common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement for its 2020 Annual Meeting of Stockholders, which the registrant intends to file pursuant to Regulation 14A with the Securities and Exchange Commission not later than 120 days after the registrant's fiscal year ended December 31, 2019, are incorporated by reference into Part III of this Annual Report on Form 10-K.

TABLE OF CONTENTS

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K ("Annual Report"), including the documents incorporated by reference, contains forward-looking statements within the meaning of the federal securities laws, Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. We intend these forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995 and are including this statement for purposes of complying with those safe harbor provisions. All statements other than statements of historical facts contained in this Annual Report on Form 10-K are forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as "may", "will", "should", "expects", "intends", "plans", "anticipates", "believes", "estimates", "predicts", "potential", "continue" or the negative of these terms or other comparable terminology. Some of the risks and uncertainties that may cause our actual results, performance or achievements to differ materially from those expressed or implied by forward-looking statements include, among others, the following

- the success, cost and timing of clinical trials for SRK-015, including the results, progress and completion of our TOPAZ Phase 2 clinical trial for SRK-015 and any future clinical trials for SRK-015, and the results, and the timing of results, from these trials;
- the success, cost and timing of clinical trials for SRK-181, including the results, progress and completion of our Phase 1 clinical trial for SRK-181 and any future clinical trials for SRK-181, and the results, and the timing of results, from these trials;
- the success, cost and timing of our other product development activities, preclinical studies and clinical trials, and the results, and timing of results, from these studies and trials;
- our success in identifying and executing a development program for additional indications for SRK-015, SRK-181 and in identifying product candidates from our other programs;
- the clinical utility of our product candidates and their potential advantages over other therapeutic options;
- our ability to obtain, generally or on terms acceptable to us, funding for our operations, including funding necessary to complete further development and, upon successful development, if approved, commercialization of SRK-015, SRK-181 or any of our future product candidates;
- the potential for our identified research priorities to advance our proprietary platform, development programs or product candidates;
- the timing, scope, or likelihood of our ability to obtain and maintain regulatory approval from the U.S. Food and Drug Administration ("FDA"), European Medicines Agency ("EMA") and other regulatory authorities for SRK-015, SRK-181 and any future product candidates, and any related restrictions, limitations or warnings in the label of any approved product candidate;
- our expectations regarding our ability to obtain and maintain intellectual property protection for our product candidates and the duration of such protection;
- our ability and the potential to successfully manufacture our product candidates for clinical trials and for commercial use, if approved;
- our ability to establish or maintain collaborations or strategic relationships, including our collaboration with Gilead Sciences, Inc. ("Gilead");
- our expectations relating to the potential of our proprietary platform technology;
- our ability to obtain additional funding when necessary;

- the size and growth potential of the markets for our product candidates, and our ability to serve those markets, either alone or in combination with others;
- our expectations related to the use of our cash reserves;
- the impact of new laws and regulations or amendments to existing laws and regulations;
- developments and projections relating to our competitors and our industry;
- our estimates and expectations regarding expenses, future revenue, capital requirements and needs for additional financing, including our expected use of proceeds from our public offerings;
- cash and expense levels, future revenues and liquidity sources;
- our expectations regarding the period during which we qualify as an emerging growth company ("EGC") under the Jumpstart Our Business Startups Act; and
- other risks and uncertainties, including those listed under the caption Part I, Item 1A "Risk Factors".

The risks set forth above are not exhaustive. Other sections of this report may include additional factors that could adversely affect our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for management to predict all risk factors, nor can we assess the impact of all risk 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. Given these risks and uncertainties, investors should not place undue reliance on forward-looking statements as a prediction of actual results. Investors should also refer to our most recent Annual Report on Form 10-K and our Quarterly Reports on Form 10-Q for future periods and Current Reports on Form 8-K as we file them with the SEC, and to other materials we may furnish to the public from time to time through Current Reports on Form 8-K or otherwise, for a discussion of risks and uncertainties that may cause actual results, performance or achievements to differ materially from those expressed or implied by forward-looking statements. We expressly disclaim any responsibility to update any forward-looking statements to reflect changes in underlying assumptions or factors, new information, future events, or otherwise, and you should not rely upon these forward-looking statements after the date of this report.

We may from time to time provide estimates, projections and other information concerning our industry, the general business environment, and the markets for certain diseases, including estimates regarding the potential size of those markets and the estimated incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research or similar methodologies is inherently subject to uncertainties, and actual events, circumstances or numbers, including actual disease prevalence rates and market size, may differ materially from the information reflected in this Annual Report on Form 10-K. Unless otherwise expressly stated, we obtained this industry, business information, market data, prevalence information and other data from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data, and similar sources, in some cases applying our own assumptions and analysis that may, in the future, prove not to have been accurate.

PART I

Item 1. BUSINESS

Overview

We are a biopharmaceutical company focused on the discovery and development of innovative medicines for the treatment of serious diseases in which signaling by protein growth factors plays a fundamental role. Our novel understanding of the molecular mechanisms of growth factor activation enabled us to develop a proprietary platform for the discovery and development of monoclonal antibodies that locally and selectively target these signaling proteins at the cellular level. We believe this approach, acting in the disease microenvironment, avoids the historical dose-limiting safety challenges associated with inhibiting growth factors for therapeutic effect. We believe our focus on biologically validated growth factors may facilitate a more efficient development path.

Our first product candidate, SRK-015, is a highly selective, fully human, monoclonal antibody, with a unique mechanism of action that results in inhibition of the activation of the growth factor, myostatin, in skeletal muscle. SRK-015 is being developed as a potential first muscle-directed therapy for the treatment of spinal muscular atrophy ("SMA"). SRK-015 is being evaluated in our TOPAZ Phase 2 proof-of-concept trial for the treatment of patients with Type 2 and Type 3 SMA. Enrollment in the trial was completed in January 2020 with a total of 58 patients enrolled. In November 2019, we announced preliminary pharmacokinetic ("PK") and pharmacodynamic ("PD") results from the first 29 patients enrolled in the TOPAZ trial that showed dose-proportional drug exposure and demonstrated target engagement, as evidenced by dose-dependent increases of up to 100-fold in the serum levels of latent myostatin following SRK-015 treatment. An interim efficacy and safety analysis of all enrolled patients following six months of treatment exposure is planned for mid-2020. Top-line results for the full 12-month treatment period are expected starting in the fourth quarter of 2020 and through the first quarter of 2021.

Our second product candidate, SRK-181, is being developed for the treatment of cancers that are resistant to checkpoint inhibitor ("CPI") therapies, such as anti-PD-1 or anti-PD-L1 (collectively called anti-PD-(L)1) antibody therapies. SRK-181 is a potent and highly selective inhibitor of the activation of latent transforming growth factor beta-1 ("TGFβ1"). In the first quarter of 2020, we initiated a Phase 1 proof-of-concept clinical trial of SRK-181 in patients with locally advanced or metastatic solid tumors that exhibit primary resistance to anti-PD-(L)1 antibodies. This two-part trial consists of a dose escalation portion (Part A) and a dose expansion portion (Part B). Part A will evaluate SRK-181 as a single-agent and in combination with an approved anti-PD-(L)1 antibody therapy) and Part B will evaluate SRK-181 in combination with an approved anti-PD-(L)1 antibody therapy in multiple tumor-specific cohorts, including urothelial carcinoma, cutaneous melanoma, non-small cell lung cancer, and other solid tumors. Initial clinical data, such as biomarker data, from Part A of the trial is expected in the second half of 2020 with clinical response and safety data from Part B of the trial anticipated throughout 2021.

Utilizing our proprietary platform, we continue to create a pipeline of novel product candidates with the potential to transform the lives of patients suffering from a wide range of serious diseases, including neuromuscular disorders, cancer, fibrosis and anemia. As an example, we are discovering and developing potent and selective inhibitors of the activation of TGFβ in collaboration with Gilead, for the treatment of fibrotic diseases. We also intend to nominate a product candidate in 2020 that targets RGMc, a co-receptor of bone morphogenetic protein 6 ("BMP6"), another member of the TGFβ superfamily, to pursue in iron-restricted anemias.

Our proprietary platform is designed to discover and develop monoclonal antibodies that have a high degree of specificity to achieve selective modulation of growth factor signaling. Growth factors are naturally occurring proteins that typically act as signaling molecules between cells and play a fundamental role in regulating a variety of normal cellular processes, including cell growth and differentiation. Current therapeutic approaches to treating diseases in which growth factors play a fundamental role involve directly targeting the active form of the growth factor or its receptor systemically throughout the body and have suffered from a variety of shortcomings, including:

- multiple growth factors often signal through the same or overlapping sets of related receptors, making it difficult to specifically modulate one pathway over another;

- members of the same growth factor superfamily share considerable structural similarities, making it difficult to achieve specific inhibition of the targeted growth factor; this can result in broad systemic inhibition that can cause undesirable, and in many cases toxic, side effects; and

- systemic and non-selective inhibition of a growth factor can block the growth factor's role in the disease process, but can also simultaneously interfere with its other normal physiological roles.

Our innovative approach is rooted in our structural biology insights into the mechanism by which certain growth factors are activated in close proximity to the cell surface. We integrate these insights with sophisticated protein expression, assay development and monoclonal antibody discovery capabilities. We believe our proprietary platform can address the challenges of current therapeutic approaches to treating diseases in which growth factors play a fundamental role by:

- targeting the natural activation mechanism to prevent activation of the growth factor rather than attempting to inhibit the growth factor after activation;

- achieving heightened specificity for the targeted growth factor while minimizing interactions with structurally similar and related growth factors, thereby reducing the risk of unintended systemic adverse events; and

- targeting the disease microenvironment, where we believe we can interfere with the disease process while minimizing the effects on the normal physiological processes mediated by the same growth factors.

We have advanced our first antibody product candidate, SRK-015, a novel, highly specific inhibitor of the activation of latent myostatin, into clinical development for the treatment of SMA. Myostatin is a negative regulator of muscle mass expressed primarily in skeletal muscle tissue, and a member of the transforming growth factor beta ("TGFβ") superfamily, a group of more than 30 related growth factors that mediate diverse biological processes. Vertebrate animals that lack the myostatin gene display increased muscle mass and strength relative to their normal counterparts, but are otherwise healthy. We believe that selective inhibition of myostatin activation may promote a clinically meaningful increase in motor function. As a result, we have focused our initial development efforts for SRK-015 on the treatment of SMA. SMA is a rare, and often fatal, genetic disorder arising from a deficiency of a protein known as "survival of motor neuron," or SMN. This disease typically manifests in young children and is characterized by atrophy of the voluntary muscles of the limbs and trunk and dramatically reduced normal neuromuscular function. An estimated 30,000 to 35,000 patients suffer from SMA in the U.S. and Europe alone, and many more patients are affected worldwide. In preclinical studies, we observed that SRK-015 promoted increased muscle mass and strength, and *in vitro* studies have shown that the antibody selectively avoids interaction with other closely related growth factors that play distinctly different physiological roles. In February and June 2019, respectively, we announced positive interim and final safety and tolerability, PD, and PK data from our Phase 1 clinical trial of SRK-015 in healthy adult volunteers. In the second quarter of 2019, we initiated our TOPAZ Phase 2 proof-of-concept trial of SRK-015 in patients with Type 2 and Type 3 SMA. Preliminary PK and PD data from the TOPAZ Phase 2 trial were announced in November 2019 and showed dose-proportional drug exposure and robust target engagement. An interim efficacy and safety analysis of all patients following six months of treatment exposure is planned for mid-2020. Top-line results for the full 12-month treatment period are expected starting in the fourth quarter of 2020 and through the first quarter of 2021. We are monitoring a number of factors related to our clinical trial, including the effect of COVID-19. We believe that SRK-015 has the potential to be the first muscle-directed therapy to improve motor function in patients with SMA and could be used both as a monotherapy or in conjunction with SMN upregulator therapies (i.e., therapies that upregulate the expression of SMN, such as SMN splicing modulators or gene therapy).

Our second antibody program is focused on the discovery and development of potent and selective inhibitors of the activation of latent TGFβ1. TGFβ1 is also a member of the TGFβ superfamily, and increased signaling by TGFβ1 is a key driver of a number of disease-relevant processes, including immune system evasion by cancer cells, bone marrow fibrosis associated with hematological disorders, and tissue and organ fibrosis. Historically, selectively targeting TGFβ1 signaling has been challenging due to the inability of both small molecule inhibitors and antibodies to avoid off-target inhibition of other, closely related growth factors, TGFβ2 and TGFβ3. Treatment of animals with these non-selective TGFβ inhibitors has been associated with a range of toxicities, most notably cardiac toxicity. In preclinical studies of our

antibodies, we have observed specific inhibition of TGFβ1 activation *in vitro* and immunomodulatory and antifibrotic activity in multiple disease models *in vivo*. We have completed a 28-day pilot nonclinical toxicology study in rats of our leading antibody and did not observe any drug-related toxicity up to the highest dose (100 mg/kg weekly) tested in the study. In the same study, we tested non-selective TGFβ inhibitors and observed the toxicities, including cardiac toxicity as well as death. In March 2019, we nominated SRK-181 as a product candidate in our cancer immunotherapy program and have since completed four-week GLP toxicology studies in rats and non-human primates and no SRK-181 related adverse effects were observed up to the highest evaluated dose of 200 mg/kg per week and 300 mg/kg per week, respectively. We are developing SRK-181 for use in cancer immunotherapy, with the aim of overcoming primary resistance to anti-PD-(L)1 therapies. A Phase 1 proof-of-concept trial in patients with locally advanced or metastatic solid tumors was initiated in the first quarter of 2020. This two-part trial consists of a dose escalation portion (Part A) and a dose expansion portion (Part B). Part A will evaluate SRK-181 as a single-agent and in combination with an approved anti-PD-(L)1 antibody therapy) and Part B will evaluate SRK-181 in combination with an approved anti-PD-(L)1 antibody therapy in multiple tumor-specific cohorts, including urothelial carcinoma, cutaneous melanoma, non-small cell lung cancer, and other solid tumors. We are monitoring a number of factors related to our clinical trial, including the effect of COVID-19.

In connection with TGFβ1 inhibitors, we also anticipate continuing to advance active discovery programs for context-dependent inhibition of TGFβ1.

In addition, in December 2018, we announced a Master Collaboration Agreement (the "Gilead Collaboration Agreement") with Gilead in the area of discovering, developing, and commercializing treatments for fibrotic diseases using highly specific inhibitors of the activation of TGFβ. Under the collaboration agreement, Scholar Rock received from Gilead $80 million in upfront payments, comprised of $50 million cash and $30 million purchase of Scholar Rock common stock. Scholar Rock is also eligible to receive a total of $1,450 million in potential milestone payments and high single-digit to low double-digit tiered royalties on sales of potential future products originating from the collaboration. In December 2019, we achieved a $25 million preclinical milestone under the Gilead Collaboration Agreement for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies. We are advancing the strategic collaboration towards product candidate selection. We retained exclusive worldwide rights to discover, develop, and commercialize certain TGFβ1 inhibitors for oncology and cancer immunotherapy.

Our third antibody program targets the signaling of BMP6, another member of the TGFβ superfamily, which is involved in a diverse set of biological processes in various parts of the body. For example, in the liver, BMP6 signaling is a key controller of the body's ability to regulate iron levels. Given BMP6's important role in iron metabolism, we believe that targeting BMP6 signaling in a liver-selective fashion presents the potential to address both iron-restricted anemias and iron overload conditions.

Signaling of BMP6 is driven by a co-receptor molecule, RGMc, also known as hemojuvelin, which is required for BMP6 signaling upon binding to its receptor. Utilizing our structural biology insights into BMP6 and its co-receptors, along with our novel antibody discovery and optimization strategies, we have identified highly specific inhibitors of RGMc's interaction with BMP6. In preclinical studies of our antibodies that target BMP6 signaling in the liver, we have observed increased serum iron levels in healthy animals. We are evaluating a limited number of these antibodies in disease models of iron-restricted anemia and intend to nominate a product candidate in 2020.

Our Pipeline

We have worldwide rights to our proprietary platform and all of our product candidates and antibodies with the exception of those that are subject to our collaboration with Gilead and certain early-stage antibodies that specifically inhibit the activation of TGFβ1 in the context of regulatory T cells, which we licensed to Janssen Biotech, Inc. ("Janssen"), a subsidiary of Johnson & Johnson in December 2013.

Our Expertise

We have assembled an experienced management team, board of directors, scientific founders and advisory board who bring extensive industry experience to our company. The members of our team have deep experience in discovering,

developing and commercializing therapeutics, having worked at companies such as Alnylam Pharmaceuticals, Inc.; Avila Therapeutics, Inc.; Biogen, Inc. ("Biogen"); Dyax Corp.; Foundation Medicine, Inc.; Ironwood Pharmaceuticals, Inc.; Novartis; Pfizer Inc.; and Takeda Pharmaceuticals Company Ltd. We were founded by internationally respected scientists, Drs. Timothy A. Springer and Leonard I. Zon of Harvard Medical School and Boston Children's Hospital.

Our Approach and Proprietary Platform

Our innovative approach is rooted in our novel understanding of the molecular mechanisms of growth factor activation and signaling and is designed to discover and develop monoclonal antibody product candidates that can inhibit the activation of a growth factor with an unprecedented degree of selectivity. Our proprietary platform is designed to generate product candidates that target the growth factor's latent precursor form prior to its activation within the disease microenvironment, or tissue where it is localized, and would normally signal upon activation.

Growth factors are naturally occurring proteins that typically act as signaling molecules between cells and play a fundamental role in regulating a variety of normal cellular processes. Members of the TGFβ superfamily of growth factors, for example, can mediate diverse biological functions, including cell growth and differentiation, tissue homeostasis, immune modulation and extracellular matrix remodeling. Growth factors, including members of the TGFβ superfamily, such as myostatin, TGFβ1 and BMP6, have also been shown to play a fundamental role in a variety of disease processes, including neuromuscular disorders, cancer, fibrosis and anemia. Because of the importance of growth factors in multiple diseases, the pharmaceutical industry has made many attempts to inhibit growth factors in a variety of therapeutic settings. However, products utilizing conventional approaches have seen only limited success. Current therapeutic approaches to treating diseases in which growth factors play a fundamental role involve directly targeting an activated growth factor or its receptor systemically throughout the body and have suffered from a variety of shortcomings:

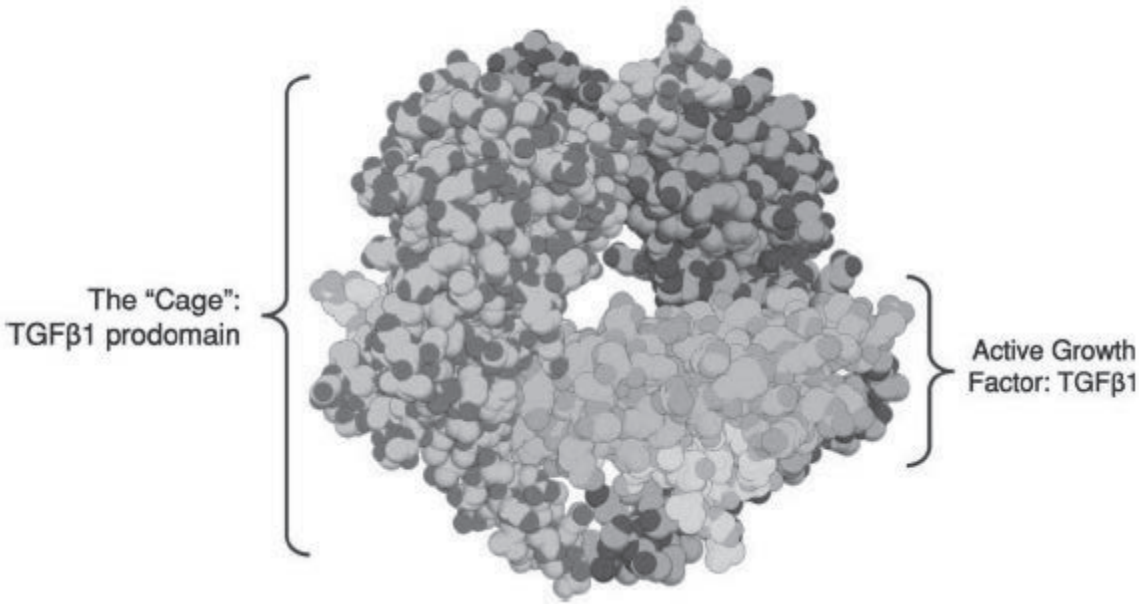
- multiple growth factors often signal through the same or overlapping sets of related receptors, making it difficult to specifically modulate one pathway over another;

- members of the same growth factor superfamily share considerable similarities (for example, myostatin and GDF11 are approximately 90% identical in the growth factor domains) making it difficult to achieve selective inhibition of the targeted growth factor. Inhibiting both the intended growth factor target and other closely related targets can result in unintentionally broad systemic inhibition that can cause undesirable, and in many cases toxic, side effects; and

- systemic and nonselective inhibition of a growth factor can block the growth factor's role in the disease process, but can also simultaneously interfere with its normal physiological roles.

Our approach to the discovery and development of growth factor-targeted drugs is fundamentally new and different from traditional approaches. Our approach is based on the breakthrough discovery by the laboratory of our co-founder, Timothy A. Springer Ph.D. of Harvard Medical School and Boston Children's Hospital, of the mechanism by which growth factors in the TGFβ superfamily are activated in the local microenvironment by a variety of specific stimuli in close proximity to the cell surface.

Unlike many other proteins that are produced and secreted by cells in a mature, or active, form, many growth factors are expressed by cells in a precursor, or latent, form. For example, TGFβ1 is produced by cells as a single protein which is then enzymatically processed by the cells into two distinct and physically separated domains — the mature growth factor and the remaining portion of the original protein, referred to as the prodomain — which remain associated as part of a complex. This secreted complex is latent, or inactive, and must first be activated to carry out its normal function in a highly localized tissue or disease microenvironment. In a seminal peer-reviewed publication in 2011, Dr. Springer elucidated a new understanding of the mechanism of activation of the latent growth factor complex among members of the TGFβ superfamily by solving a high resolution x-ray crystal structure of this latent form of TGFβ1 (as illustrated in the graphic below).



Structural representation of the latent form of TGFβ1
wherein the prodomain wraps around the active growth factor

This research explained at a molecular level why the secreted form of TGFβ1 is inactive. The prodomain, though physically separated from the mature growth factor domain, forms a "cage" around the active form of TGFβ1, blocking the growth factor from signaling through its receptor. Only when the cage is "unlocked" by a precursor activation event can the growth factor be released and mediate its effects in the local microenvironment. Dr. Springer further hypothesized that this phenomenon likely holds true for most members of the TGFβ superfamily, though the exact nature of the activation event, such as integrin binding or enzymatic cleavage, may differ among members of the superfamily. Importantly, while many growth factors are structurally very similar, their cages are structurally diverse, and this provides the basis for our approach to improved selectivity.

To enable our novel approach, we have built a proprietary platform that is rooted in our structural biology insights into activation of latent growth factor precursors. We integrate these insights with sophisticated protein expression, assay development and monoclonal antibody discovery capabilities. In addition to such know-how, our proprietary platform is covered by two patent families, with issued patents projected to expire in 2034 excluding any patent term adjustments or extensions. The key elements of our proprietary platform include the following:

- focusing on growth factor targets with a high degree of evidence implicating them in a disease process or processes;
- generating recombinant versions of the latent forms of targeted growth factors, as well as versions of closely related growth factors utilizing proprietary technology and in-house expertise;
- developing proprietary assays in which we are able to recapitulate the natural activation mechanism that these growth factors undergo in the human body;
- designing sophisticated selection strategies utilizing recombinant antibody libraries such as phage and yeast display that allow us to identify monoclonal antibodies, a well-established therapeutic modality, that can modulate the activation of these growth factors without having an effect on the activation of other closely related growth factors; and

- optimizing the output of such selections to ensure that our product candidates have the appropriate characteristics for manufacturability and further development.

Using our innovative approach and proprietary platform, we are creating a pipeline of novel product candidates that selectively modulate the activation of growth factors implicated in a variety of serious diseases. We also see applicability of our structural biology insights beyond the activation of latent growth factor precursors.

We believe there are several important advantages to our approach over conventional therapeutic approaches, which inhibit the growth factors or their receptors systemically throughout the body:

- targeting the latent precursor allows intervention at the site of action, within the microenvironment of the diseased tissue. Because our antibodies specifically bind the latent forms of the growth factors, we can prevent the activation of the growth factors. Given that many growth factors act primarily within the microenvironment where they are activated, as opposed to exerting their effects systemically, we believe that prevention of activation is a preferred mode of action for achieving improved outcomes. In contrast, traditional approaches to targeting growth factor signaling are focused on inhibiting the growth factor after it has been activated and released systemically;

- targeting the latent precursor allows heightened selectivity among structurally related growth factors, which we believe could limit off-target effects. For example, two members of the TGFβ superfamily, myostatin and GDF11, are 90% identical in their growth factor domains. Therefore, many of the traditional inhibitors that target myostatin also inadvertently inhibit GDF11. Similarly, most of the known inhibitors of TGFβ are pan-inhibitors, meaning that they do not distinguish among the three isoforms of TGFβ, namely, TGFβ1, TGFβ 2 and TGFβ3. Despite the sequence similarities of the active forms of these growth factors, their cages are structurally diverse. We have been able to harness this diversity to generate antibodies that specifically bind the inactive growth factor precursors and inhibit activation of a particular growth factor of interest, but not others that are closely related; and

- targeting these precursor forms in the disease microenvironment, we believe we can interfere with the disease process while minimizing the effects on the normal physiological processes mediated by growth factors.

Our Strategy

Using our proprietary platform to unlock the therapeutic potential of targeting growth factor signaling in the disease microenvironment, our goal is to deliver novel therapies to underserved patients suffering from a wide range of serious diseases, including neuromuscular disorders, cancer, fibrosis and anemia. To achieve this goal, we plan to:

- **Advance our first product candidate, SRK-015, through clinical proof-of-concept.** We are currently developing our first product candidate, SRK-015, for the treatment of patients with SMA. By targeting the latent form of myostatin and specifically inhibiting its activation in muscle, we believe SRK-015 holds considerable promise in addressing the motor functional deficits in patients with SMA. In the second quarter of 2019, we initiated our TOPAZ Phase 2 proof-of-concept trial of patients with Type 2 and Type 3 SMA and completed enrollment of the trial in January 2020. In November 2019, we announced preliminary PK and PD results from the first 29 patients enrolled in the trial that showed dose-proportional drug exposure and demonstrated robust target engagement. An interim efficacy and safety analysis of all patients following six months of treatment exposure is planned for mid-2020 with top-line results for the full 12-month treatment period expected starting in the fourth quarter of 2020 and through the first quarter of 2021. A subgroup analysis from the CHERISH trial of nusinersen in later-onset SMA revealed that among the subgroup of patients initiated on therapy after the age of five years or older, it was rare (<15%) for such individuals to attain a 3-point or greater improvement from baseline in the Hammersmith Functional Motor Scale Expanded ("HFMSE"). As a result, we believe that if a substantial proportion of similar patients in the TOPAZ trial (i.e., individuals who were started upon nusinersen therapy at the age of five years or older) attain a 3-point or greater improvement in the HFMSE or RHS following SRK-015 treatment, such a finding would provide important evidence of SRK-015's clinical benefit. Other analyses,

including those evaluating other endpoints, are also planned to further characterize the efficacy of SRK-015. In addition, we believe that SRK-015 may have a role in treating other disorders, and in 2020 we intend to identify an additional indication.

- ***Advance our TGFβ1 product candidate, SRK-181, through clinical proof-of-concept.*** Our second antibody program is focused on the discovery and development of potent and selective inhibitors of the activation of latent TGFβ1. We believe that the selectivity of our antibodies is a significant differentiator in our efforts to address the historical dose-limiting safety challenges resulting from non-selectively inhibiting multiple isoforms that activate the TGFβ signaling pathway. In preclinical studies of our antibodies, we have observed inhibition of TGFβ1 activation in vitro, and immunomodulatory and antifibrotic activity in multiple *in vivo* disease models. Our observations of anti-tumor activity in multiple preclinical models of cancer immunotherapy, in addition to the favorable results of our pilot toxicology studies in rats led to the March 2019 nomination of SRK-181 as a product candidate to overcome primary resistance to CPI therapies. We initiated a Phase 1 proof-of-concept clinical trial of SRK-181 in the first quarter of 2020 in patients with locally advanced or metastatic solid tumors. This trial will focus on solid tumors for which anti-PD-(L)1 antibody therapies are approved and evaluate patients experiencing primary resistance to anti-PD-(L)1 antibody therapy. This two-part trial consists of a dose escalation portion (Part A) and a dose expansion portion (Part B). Part A will evaluate SRK-181 as a single-agent and in combination with an approved anti-PD-(L)1 antibody therapy) and Part B will evaluate SRK-181 in combination with an approved anti-PD-(L)1 antibody therapy in multiple tumor-specific cohorts, including urothelial carcinoma, cutaneous melanoma, non-small cell lung cancer, and other solid tumors. Initial clinical data, such as biomarker data, from Part A of the trial is expected to be available in the second half of 2020 with clinical response and safety data from Part B of the trial anticipated throughout 2021. Additionally, we believe that SRK-181 has the potential to address unmet medical needs in other oncology indications, and we will endeavor to maximize the value of this product candidate by exploring its potential in additional oncology indications.

- ***Advance additional TGFβ program candidates in non-oncology indications.*** We believe that additional product candidates in the TGFβ program have the potential to address other disorders associated with increased TGFβ signaling, including tissue and organ fibrosis. To advance the discovery and development of selected inhibitors originating from our TGFβ program that we believe have the potential to address unmet medical needs in non-oncology indications, we have entered into a fibrosis-focused collaboration with Gilead, wherein we are responsible for antibody discovery and preclinical research through product candidate nomination, and Gilead will be responsible for the program's nonclinical and clinical development as well as commercialization. In December 2019, we achieved a $25 million preclinical milestone under the Gilead Collaboration Agreement for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies. We are advancing the collaboration towards product candidate selection.

- ***Continue to leverage our proprietary platform to expand our pipeline beyond current lead programs.*** We will continue to leverage our proprietary platform to selectively target the activation of additional growth factors, both within and beyond the TGFβ superfamily. Given the established role of signaling by protein growth factors in numerous diseases, we believe that these efforts could result in multiple new opportunities to treat diseases with high unmet medical need. In order to support our pipeline expansion and intention to be the leader in the field of growth factor-targeted drug development, we are investing in the technologies supporting our proprietary platform, including a focus on tools and assays to enhance and accelerate our drug discovery process. Furthermore, we believe that our structural insights have applicability beyond growth factor activation.

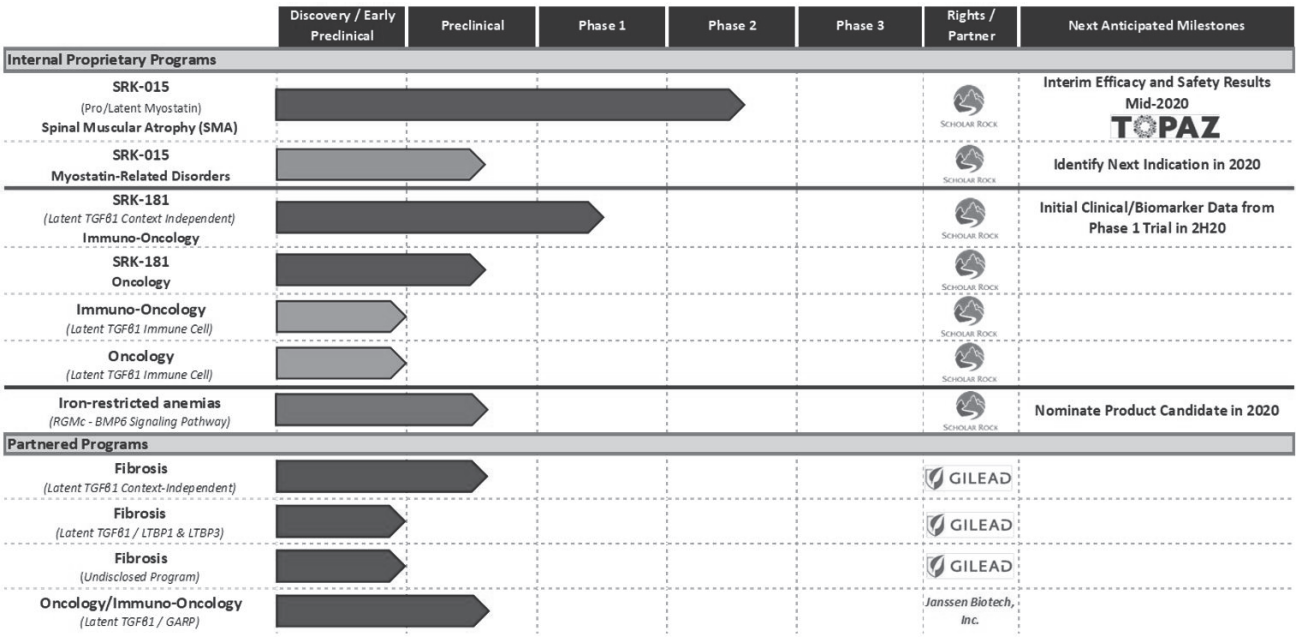
- ***Selectively seek strategic collaborations to maximize the value of our proprietary platform and pipeline.*** Given the potential of our proprietary platform to generate novel product candidates that could treat a wide

variety of diseases, we believe that we can maintain in-house discipline with respect to our key development and commercialization efforts, while at the same time maximizing the full potential of our proprietary platform for other disease areas and indications. As a result, and as exemplified by our ongoing collaboration with Gilead, we may seek to form additional strategic collaborations around certain targets, product candidates or disease areas that we believe could benefit from the resources of either larger biopharmaceutical companies or those specialized in a particular area of relevance.

Our Pipeline Programs

Using our innovative approach and proprietary platform, we are creating a differentiated pipeline of novel product candidates that selectively inhibit the activation of latent growth factor believed to be important drivers in a variety of diseases, including neuromuscular disorders, cancer, fibrosis and anemia. Our proprietary platform includes (i) our know-how expression and purification of latent protein growth factor complexes in quantity and quality sufficient to enable antibody discovery; (ii) strategies to identify rare antibodies that selectively bind targeted latent protein growth factor complexes; and (iii) assays developed by us in which to test the highly selective antibodies' ability to modulate the activation of specific latent growth factors. We have worldwide rights to our proprietary platform and all of our product candidates, with the exception of those that are subject of our fibrosis-focused collaboration with Gilead, and early-stage antibodies that specifically inhibit the activation of TGFβ1 in the context of regulatory T cells, which we licensed to Janssen.

The following summarizes our pipeline programs:



Our First Product Candidate and Additional Programs

SRK-015 — Our Inhibitor of Myostatin Activation

We are developing SRK-015, a novel, highly selective inhibitor of the activation of the growth factor myostatin, as a potential first muscle-directed therapy for the treatment of SMA. Myostatin, a member of the TGFβ superfamily of growth factors, is expressed primarily in skeletal muscle cells and the absence of its gene is associated with an increase in muscle mass and strength in multiple animal species. We believe that inhibition of the activation of myostatin may promote a clinically meaningful increase in motor function. In preclinical studies, treatment with SRK-015 resulted in an increase in muscle mass and strength in multiple animal models of muscle atrophy. In February 2019, we announced positive results from our Phase 1 trial in healthy adult volunteers, which supported the advancement of SRK-015 into a Phase 2 trial. In the second quarter of 2019, we initiated our TOPAZ Phase 2 proof-of-concept trial to evaluate SRK-015 for the treatment of SMA. We completed enrollment of patients with Type 2 and Type 3 SMA across all three cohorts of our TOPAZ trial in January 2020 and expect to have interim efficacy and safety results of all enrolled patients following six months of treatment exposure in mid-2020 with top-line results for the full 12-month treatment period expected starting in the fourth quarter of 2020 and through the first quarter of 2021.

Background on SMA

SMA is a rare, and often fatal, genetic disorder that typically manifests in young children. It is characterized by the loss of motor neurons, atrophy of the voluntary muscles of the limbs and trunk and progressive muscle weakness. Disease severity in SMA can range from patients who die soon after birth to patients who live into adulthood with varying degrees of morbidity. The underlying pathology of SMA is caused by insufficient production of a protein known as "survival of motor neuron," or SMN. The SMN protein, essential for the survival of motor neurons, is encoded by two genes, SMN1 and SMN2.

- SMN1 genes produce the majority of functional SMN protein; healthy individuals have one or two functional copies of SMN1, while patients with SMA have mutations in or deletions of both copies of the gene.
- SMN2 genes produce only 10% to 20% of functional SMN protein and an individual's copy number of the SMN2 gene can range from zero to eight. In SMA patients, the number of SMN2 genes present in their genome is correlated with disease onset and severity; patients who have a lower number of SMN2 gene copies generally develop earlier and more severe SMA, because they produce less SMN protein.

SMA Natural History and Epidemiology

SMA, the most common monogenic cause of death in infants, is a rare neuromuscular disorder. An estimated 30,000 to 35,000 patients suffer from SMA in the U.S. and Europe alone. Patients with SMA can be categorized as one of four types, Type 1 through Type 4. More than 85% of SMA patients currently living are estimated as having Type 2 or Type 3 disease. Type 2 and Type 3 SMA will be the initial focus of investigation in the development program.

- Type 1 disease is the most severe form, with clinical signs emerging at or shortly following birth. Patients with Type 1 SMA suffer from respiratory compromise and often require mechanical ventilation shortly after birth. Type 1 infants are never able to sit without support. Type 1 SMA is the most common form of the disease, and accounts for 58% of patients born with SMA. Historically, only 1% of patients with Type 1 disease survive beyond two years of age without mechanical respiratory support. Type 1 SMA represents only 14% of patients with SMA, although recent therapies may extend patient lifespans. Type 1 patients begin to lose motor neurons and muscle mass before birth.
- Type 2 disease manifests in early childhood and is less severe than Type 1 disease, although patients exhibit profound deficits in motor function. Patients with Type 2 disease may be able to sit independently but they will never walk without aid. While only 29% of the incident population, patients with Type 2 disease account for 51% of the patients living with SMA today.

- Type 3 disease manifests usually in childhood and accounts for about 13% of patients born with SMA, although patients in this category account for 35% of all patients living with SMA today. While Type 3 SMA patients usually learn to walk unaided, many individuals lose that ability over time. Ambulatory Type 3 SMA patients commonly suffer from substantial motor functional impairment, as evidenced by HFMSE scores and Six-Minute Walk Test distances, two commonly used measures of motor function.

- Type 4 disease is the mildest form of SMA, and its population is not well characterized. After symptom onset, which is most commonly reported between 20 and 30 years of age, patients experience mild to moderate muscle weakness and increasing disabilities. Patients are ambulatory and their life expectancy is normal.

Unmet Medical Need in SMA

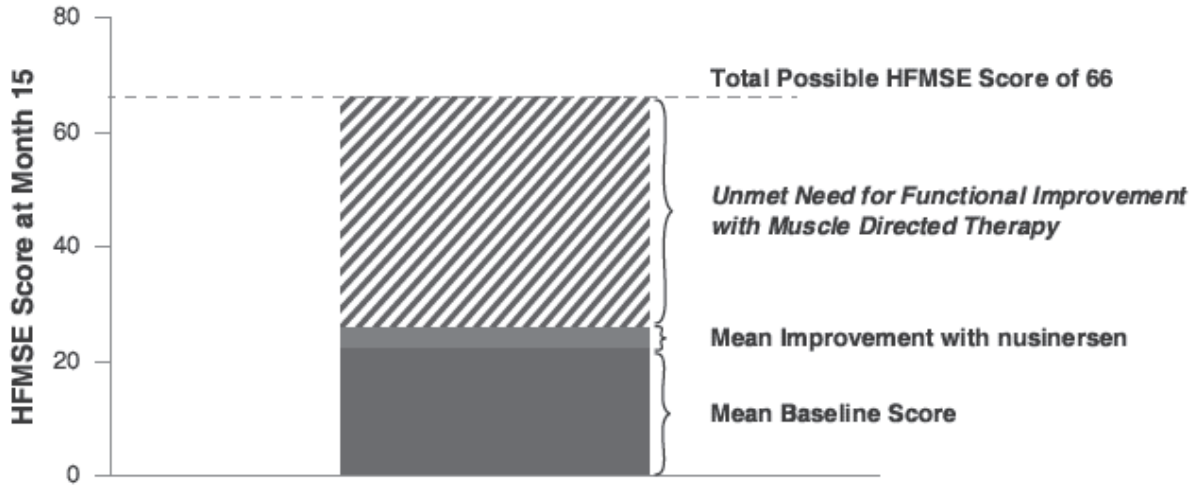
We view the emerging landscape for the development of novel medicines for SMA as being classified into two distinct but complementary therapeutic strategies: 1) SMN upregulator therapy and 2) muscle-directed therapy. Despite progress in the development of SMN upregulator therapies, a high unmet medical need to improve motor function remains. We believe that the advancement of muscle-directed therapy will be necessary to address this important gap.

SMN upregulator therapies (which also can be categorized as SMN corrector therapies) are aimed at addressing the SMN deficiency to prevent further motor neuron deterioration. This category includes antisense oligonucleotide and small molecule approaches to increase SMN2 expression as well as gene therapy to deliver the SMN1 gene. The primary benefit of such an approach appears to be to address the SMN deficiency and to modify the course of disease. Early intervention at a very young age is therefore thought to be essential to prevent significant motor functional deterioration. However, for the vast majority of SMA patients living today, this early intervention window has been missed, and such individuals suffer from severe functional impairment. Thus, regardless of the precise nature or mechanism of action for any given SMN upregulator therapy, we believe that most SMA patients will continue to experience clinically significant functional deficits.

The continuing unmet medical need, despite advancement in SMN upregulator therapies, is illustrated by the insights emerging from the clinical development of nusinersen. Nusinersen is an antisense oligonucleotide directed against SMN2 that aims to increase functional SMN protein expression. Nusinersen was approved by the FDA in December 2016 and the EMA in June 2017 for the treatment of patients with SMA.

The CHERISH pivotal trial of nusinersen in later-onset SMA patients made use of the HFMSE, a validated outcome measure specifically designed for evaluation of Type 2 and 3 SMA patients that is often used in clinical practice and studies. This examination assesses 33 individual items of motor activity, each scored from 0 to 2 points (lower score indicates worse motor function), with a maximum possible score of 66. The HFMSE evaluates a patient's ability to perform basic tasks such as sitting, reaching one's hand to one's head, changing body positions (e.g. sitting to lying position), crawling, standing, kneeling, squatting, jumping and ascending/descending stairs. These tasks are viewed by SMA patients and caregivers as meaningful and relevant to conducting activities of daily living.

Patients who received nusinersen achieved an approximately 4-point mean improvement at Month 15 from a mean baseline of 22. Compared to control patients, there was a statistically significant difference of approximately 5 points in the mean change from baseline to Month 15 in the HFMSE score. The observed therapeutic benefit was clinically important, but as the maximum possible score on the HFMSE scale is 66, representing the level of motor function of a healthy young child, the gap in attaining normal functional performance is still dramatic despite nusinersen therapy.



Mean improvement in HFMSE score experienced by patients with later-onset SMA in the Phase 3 CHERISH clinical trial of nusinersen.

Thus, despite progress in SMN upregulator therapies, such as nusinersen, there remains a significant unmet need to address the persistent functional deficits suffered by most SMA patients. Muscle-directed therapies are aimed at complementing SMN upregulator therapies by increasing a patient's functional performance above their baseline. For patients with less severe SMN deficiency (e.g., ambulatory type 3 SMA) who have a considerably slower progression of disease, muscle-directed therapies have the potential to be effective as monotherapy, even without concomitant SMN upregulator treatment.

To address this need, SRK-015 is being developed as a potential first muscle-directed therapy for SMA. We envision the potential for SRK-015 to be a critical complement to any SMN upregulator therapy in Type 2 and 3 SMA in order to drive absolute increases in functional performance over baseline. In patients with less severe SMN deficiency or in patients unable to receive intrathecally administered product, we believe that SRK-015 may be used as monotherapy. We also view SRK-015 as having potential in the treatment of Type 1 SMA as well as presymptomatic SMA in conjunction with SMN upregulator therapy. Our vision is that SRK-015 has the potential to be the backbone treatment for the broadest group of patients with SMA, in some contexts being used in conjunction with any type of SMN upregulator or in other contexts being used alone as a monotherapy.

Myostatin in SMA and Challenges with Traditional Approaches

Our first product candidate, SRK-015, is a selective inhibitor of the activation of latent myostatin that acts locally within skeletal muscle. Myostatin, also known as growth differentiation factor 8 ("GDF8"), is a member of the TGFβ superfamily and is produced by skeletal muscle cells. As with other tissues and organs in the human body, healthy muscle homeostasis is maintained by a proper balance of growth signals, or anabolic stimuli, and breakdown signals, or catabolic stimuli. In humans, the anabolic stimuli that drive muscle growth are proteins, such as the human growth hormone and the insulin-like growth factor 1. In contrast, myostatin is a catabolic agent that functions as a negative regulator of muscle mass.

Skeletal muscle fibers are generally classified as fast-twitch or slow-twitch. Fast-twitch fibers play a key role in motor activities, such as those involving quick bursts of strength. In contrast, slow-twitch fibers are important for endurance activities. Animals lacking functional myostatin genes, or its receptor, have larger muscles and increased strength compared to normal animals. While the absence of myostatin does lead to overall increases in muscle mass, a preferential effect on muscles enriched for fast-twitch muscle fibers has been observed in animals. Such animals are otherwise healthy and live a normal life-span.

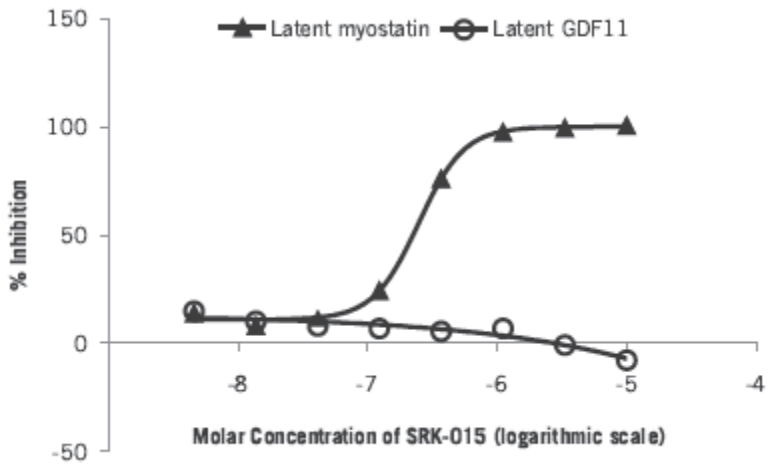
Because of its role in regulating muscle mass, myostatin has been a popular target for a variety of drug development programs. There have been two general approaches to trying to inhibit the signaling of myostatin in humans. The first is to develop an antibody, or an antibody-like molecule, that binds to mature myostatin in circulation and prevents its ability to signal through its receptor, the ActRIIb receptor. The second is to develop an antibody to the ActRIIb receptor itself, or a soluble decoy of the ActRIIb receptor, with a goal of preventing myostatin signaling through its receptor. Both of these approaches, however, have significant limitations.

As a member of the TGFβ superfamily, mature myostatin shares considerable structural similarity with other family members. For example, the active form of myostatin and its most closely related family member, GDF11, are 90% identical in the growth factor domains, making it extremely challenging to identify antibodies that are truly specific for myostatin and do not interfere with other targets. Moreover, attempts to interrupt myostatin signaling through its receptor are complicated by the fact that the ActRIIb receptor, in addition to being the receptor for myostatin, is also the receptor for a number of related family members, including GDF11, activins and other growth factors. Attempts to block the signaling of myostatin by targeting its receptor therefor inevitably interfere with the signaling of these other growth factors, many of which are involved in normal biological processes unrelated to muscle.

There are multiple examples of clinical trials demonstrating the risk of non-selective inhibition of myostatin. For example, in a Phase 2 trial in Duchenne Muscular Dystrophy reported in 2017, a soluble decoy of the ActRIIb receptor resulted in bleeding side effects believed by the sponsor to be unrelated to inhibition of myostatin signaling, but instead related to the inhibition of signaling by certain other members of the TGFβ superfamily known to be important in the maintenance of vascular integrity. These side effects resulted in termination of the clinical program. More recently, results from a clinical trial were reported showing that treatment of patients with an antibody to the ActRIIb receptor resulted in suppression of the levels of follicle stimulating hormone, an important reproductive hormone. In this trial, the sponsor believed that these effects were likely related to inhibition of signaling through the ActRIIb receptor.

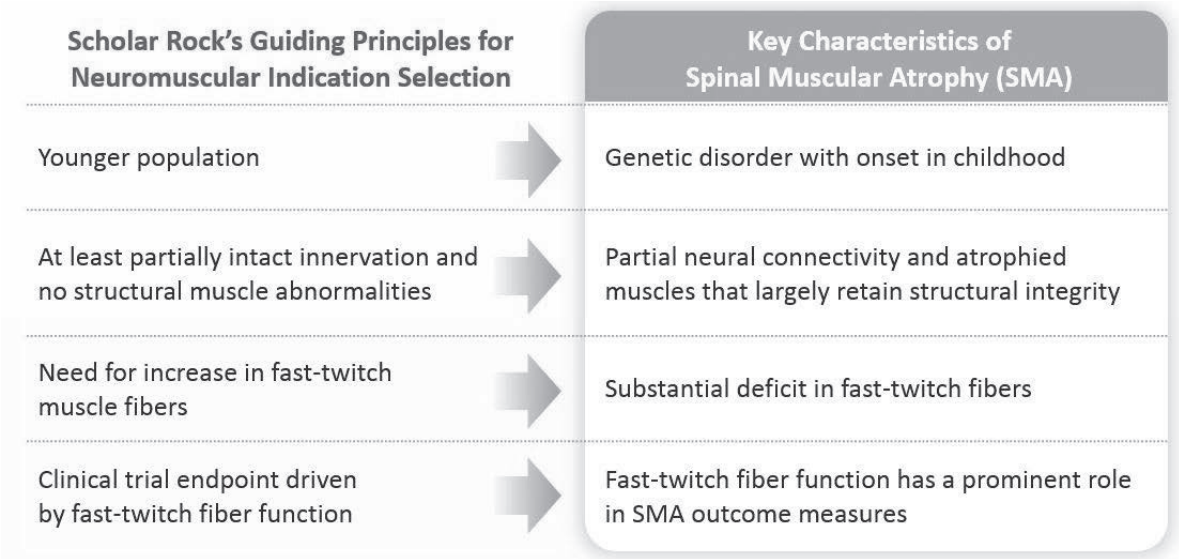
Our Solution

Utilizing our proprietary platform, we targeted the precursor form of myostatin and generated SRK-015, a novel, highly selective inhibitor of the activation of myostatin from its inactive precursor in skeletal muscles, where myostatin resides and signals upon activation. While mature myostatin is 90% identical in the growth factor domain to its most closely related TGFβ superfamily member, GDF11, the prodomain that cages mature myostatin and keeps it in its latent precursor form is only 52% identical to the GDF11 prodomain. As a result, in preclinical studies, we observed that SRK-015 bound to latent myostatin with a high level of selectivity, while having no binding to, and no effect on, the activation of related TGFβ family members.



SRK-015 showed dose-dependent inhibition of latent myostatin activation in an in vitro activation assay and had no effect on latent GDF11 activation.

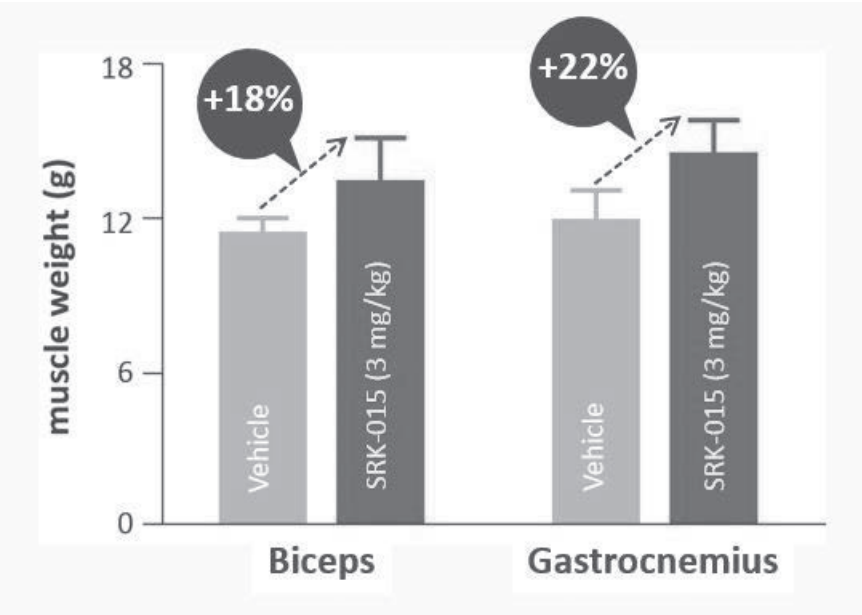
We believe that the therapeutic potential for SRK-015 in increasing motor function is more optimal when a given disease bears certain features. Based on our translational and preclinical efforts, we have formulated a set of guiding principles to inform indication selection within the category of neuromuscular disease. As summarized in the table below, we believe that the pathobiological and clinical characteristics of SMA are well-aligned with these guiding principles. Since myostatin regulates muscle catabolism rather than anabolism, we believe that having a background of anabolic capacity is important to drive muscle growth in the setting of myostatin inhibition. Anabolic capacity is most robust in younger individuals and diminishes as one ages. SMA is a genetic disorder with onset commonly in childhood, and the initial focus of the development program will be in children and young adults. Furthermore, in SMA, there is a significant but incomplete loss of motor neurons, ensuring at least some intact signaling between skeletal muscle and nerve. In addition, generally, there are also no apparent structural abnormalities in the skeletal muscle. The partial loss of motor neurons causes substantial atrophy of fast-twitch muscle fibers that in turn leads to many of the motor function impairments. Validated outcome measures are available for SMA clinical trials that are relevant to fast-twitch fiber activity. These outcome measures, such as the HFMSE, assess a large number of motor activities that involve short-term bursts of strength, which are driven by fast-twitch muscle fibers. These endpoints therefore measure an outcome that may be more likely to be directly affected by SRK-015.



Key disease features of SMA are aligned with Scholar Rock's guiding principles for neuromuscular indication selection for SRK-015

SRK-015 Preclinical Results

In our earliest pharmacology work, we observed that treatment with SRK-015 robustly increased muscle mass and gains in muscle strength in healthy mice. The increase in muscle mass was also seen upon treatment of non-human primates. As shown in the figure below, in this study, the biceps brachii (an arm muscle) and gastrocnemius (a calf muscle), two muscles containing a higher proportion of fast-twitch fibers than slow-twitch fibers, increased in size by 18% and 22%, respectively, in cynomologus monkeys treated with SRK-015 as compared to the vehicle control group.

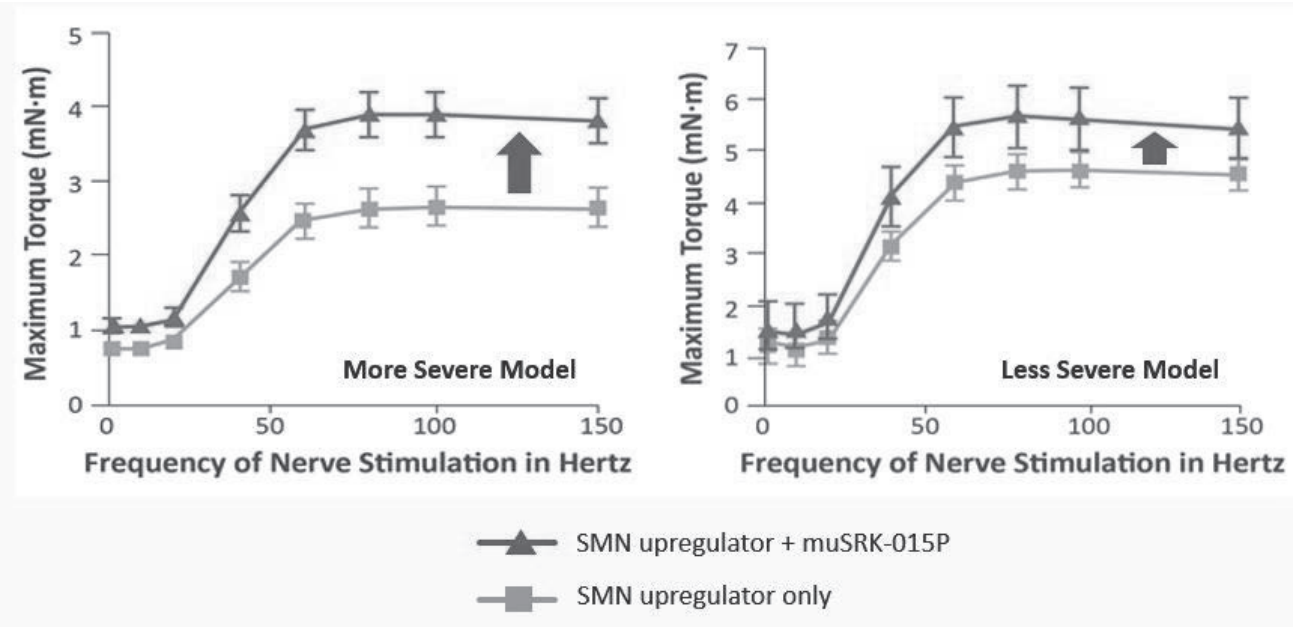


SRK-015 treatment increased muscle mass, as measured by muscle weight in the gastrocnemius (a calf muscle) and biceps brachii (an arm muscle) of cynomolgus monkeys as compared to monkeys treated with the vehicle only.

We next assessed the ability of inhibition of myostatin activation to improve muscle function in the SMNΔ7 mouse model, a genetic model of SMA wherein the SMN1 gene has been deleted and copies of the human SMN2 gene have been introduced, thus mimicking the genetics of the human disease. SMNΔ7 mice are extremely fragile if not treated with a drug that upregulates the underlying deficiency in SMN. Accordingly, this model is best suited for determining the effect of a myostatin inhibitor when administered in conjunction with an SMN upregulator. In this study, we used a small molecule SMN2 splice modulator, SMN-C1, as the SMN upregulator. To modulate disease severity in this mouse model, the dosage and timing of intervention with the SMN upregulator were varied.

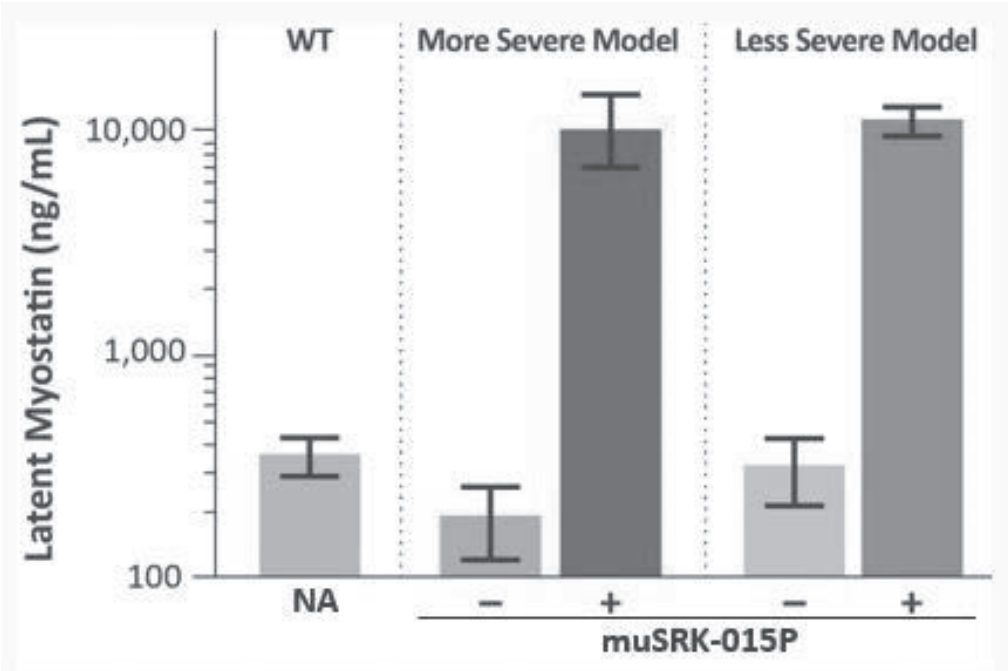
In the model with a relatively more severe SMA phenotype, mice received four weeks of treatment with muSRK-015P (the parental clone of SRK-015 on a mouse IgG1 framework) as well as optimal doses of the SMN upregulator that mimic the use of therapy to more fully restore SMN expression. This led to a significant increase in muscle strength, as demonstrated by a 44%-51% increase in maximal torque of the plantarflexor muscle group, compared to control animals treated only with optimal doses of the SMN upregulator over the same treatment period.

In the model with a relatively less severe SMA phenotype, mice received four weeks of treatment with muSRK-015P, together with background therapy with optimal dosing of the SMN upregulator that was started shortly after birth. This resulted in a 20%-30% increase in maximal torque of the plantarflexor muscle group, compared to control animals not treated with muSRK-015P.



muSRK-015P, in combination with an SMN upregulator, improved in vivo muscle force generation in versions of the Δ7 mouse model designed to emulate either a more severe (left side) or less severe (right side) form of SMA, as compared to SMN upregulator therapy alone. Muscle force was assessed by maximum torque generation following nerve stimulation, at a range of frequencies, in the plantar flexor muscle group in the leg. The arrows indicate the increase in muscle force generation due to muSRK-015P treatment.

In addition to the observed increases in muscle strength in these preclinical models of SMA, administration of the antibody to these mice resulted in significant increases in circulating latent myostatin as measured by immunoassay of serum from animals treated with the antibody. This observation, along with the observed increase in muscle strength, is consistent with the hypothesis that sufficient myostatin remains in disease-state muscle and that activation of myostatin contributes to muscle loss in this model of SMA. It should also be noted that, when the levels of latent myostatin are normalized to muscle mass in normal mice versus SMA mice, there is no significant difference in latent myostatin levels per unit of muscle mass. Further, we believe this observation suggests that latent myostatin, which is bound to muSRK-015P, exits its extracellular site of activation in muscle, indicative of target engagement.



muSRK-015P engages latent myostatin in both mouse models of SMA, as measured by increases in serum latent myostatin upon antibody treatment.

Clinical Development Overview

We initiated our Phase 1 clinical trial of SRK-015 in adult healthy volunteers in May 2018, and interim analysis results from this trial (as announced in February 2019) supported the advancement of SRK-015 into the TOPAZ Phase 2 proof-of-concept clinical trial, which will evaluate the safety and efficacy of SRK-015 in patients with Type 2 and Type 3 SMA. Enrollment in the TOPAZ trial was initiated in the second quarter of 2019 and was completed in January 2020. Interim safety and efficacy results from the TOPAZ trial for all enrolled patients following six months of treatment exposure is expected mid-2020 with top-line results for the full 12-month treatment period starting in the fourth quarter of 2020 and into the first quarter of 2021.

Beyond Type 2 and Type 3 SMA, we believe that SRK-015 has the potential to contribute an important therapeutic benefit to patients with either more or less severe forms of SMA as well as pre-symptomatic patients receiving early intervention with a SMN upregulator therapy.

Our aim is to develop SRK-015 as the backbone treatment for the broadest group of patients suffering from SMA, in some contexts being used in conjunction with any type of SMN upregulator or in other contexts being used alone as a monotherapy. The FDA has granted Orphan Drug Designation and the European Commission ("EC"), has granted Orphan Medicinal Product Designation, to SRK-015 for the treatment of SMA.

Phase 1 Clinical Trial Results

The randomized, double-blind, placebo-controlled, first-in-human, Phase 1 trial was designed to evaluate the safety and tolerability, immunogenicity, PK, and PD of IV administered SRK-015 in adult healthy volunteers. A total of 66 subjects were enrolled, including 40 subjects in the single ascending dose ("SAD") and 26 subjects in the multiple ascending dose ("MAD") portions of the study. Subjects in the SAD were randomized 3:1 to receive single doses of placebo or SRK-015 across staggered dosing cohorts (1, 3, 10, 20, or 30 mg/kg), while subjects in the MAD were randomized 3:1 to receive multiple biweekly doses (on Days 0, 14, and 28) of placebo or SRK-015 across staggered dosing cohorts (10, 20,

or 30 mg/kg). Full results from the Phase 1 trial were announced and presented at the Cure SMA Annual Conference in June 2019.

Safety and Immunogenicity Results

SRK-015 was shown to be well-tolerated with no apparent safety signals in this study. (Note: the adverse events ("AEs") that are subsequently outlined refer to treatment-emergent AEs, i.e. AEs with onset upon or after administration of study drug, or in the event that onset time precedes study drug administration, the AE increases in severity during the post-dosing follow-up period after a subject has received the first dose of study drug).

There were no dose-limiting toxicities (up to the highest tested dose of 30 mg/kg), deaths, subject discontinuations due to a treatment-related AE, treatment-related serious adverse events ("SAEs"), or hypersensitivity reactions.

In the SAD portion of the trial, AEs were observed in 30% (9/30) of all SRK-015 treated subjects and 50% (5/10) of all placebo-treated subjects respectively. The most frequently reported AE was headache, all occurring in three subjects at the 1 mg/kg SRK-015 group; none were assessed as being treatment-related and all resolved.

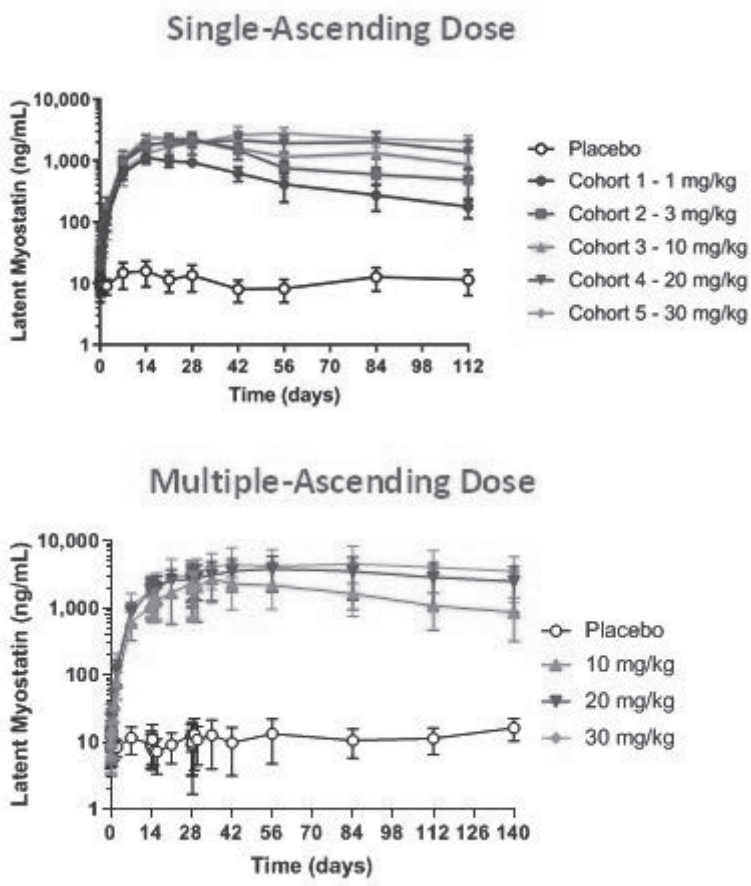
In the MAD portion of the trial, AEs were observed in 35% (6/20) of all SRK-015 treated subjects and 67% (4/6) of all placebo-treated subjects respectively. The most frequently reported AE was postural dizziness, occurring in one subject in the SRK-015 20 mg/kg group and in two placebo subjects. All of these events were mild in severity and resolved. There was one reported SAE of pancreatitis in a MAD cohort subject treated with SRK-015 at 10 mg/kg. The pancreatitis was determined to be due to gallstones, and this AE was assessed by the trial investigator as unrelated to SRK-015.

Immunogenicity was assessed by anti-drug antibody testing, and all subjects tested negative.

Pharmacokinetics and Pharmacodynamics Results

SRK-015 displayed a well-behaved PK profile generally consistent with that commonly observed with monoclonal antibodies. Drug exposure was dose proportional, and the serum half-life was approximately 23 to 33 days across the SRK-015 dose groups. The findings supported the investigation of a once every 4-week dosing regimen in the TOPAZ Phase 2 trial.

Pharmacodynamics was evaluated through a propriety, exploratory biomarker assay developed by Scholar Rock that measures serum concentrations of latent myostatin. The scientific basis for this assay was the observation that treatment of animals (including nonhuman primates) with SRK-015 leads to substantial increases in the serum levels of latent myostatin. It is believed that SRK-015 binds the latent myostatin residing within skeletal muscle and that the resulting inactive complex enters into the systemic circulation before being removed by the usual mechanism of clearing antibody-antigen complexes. While the assay does not distinguish between bound and unbound latent myostatin, the background serum levels of latent myostatin are low in untreated animals. This observation suggests that the vast majority of latent myostatin detected in the assay after treatment are in the form of latent myostatin bound by SRK-015. Thus, observation of increases in serum latent myostatin would indicate target engagement.



SRK-015 engages latent myostatin in Phase 1 clinical trial subjects

In the SAD, mean serum concentrations of latent myostatin were < 20 ng/ml in the pre-treatment baselines for SRK-015 treated subjects as well as in placebo subjects throughout the study. Following placebo treatment, there was no meaningful change in the latent myostatin biomarker concentrations. Following single doses of SRK-015 at dose levels of 3 mg/kg or greater, marked increases in latent myostatin biomarker concentrations in the serum, by at least an order of magnitude, were observed following SRK-015 treatment. This finding demonstrates successful target engagement and provides initial proof-of-mechanism in humans of our therapeutic approach of targeting the latent form of growth factors. The observation also corroborates our biological understanding that the vast majority of drug target (pro and latent forms of myostatin) resides within skeletal muscle rather than within the systemic circulation. For example, we had previously found that treatment with the murine equivalent of SRK-015 in an SMA mouse model led to marked increases in latent myostatin marker biomarker concentrations in the serum regardless of background disease severity.

The serum biomarker concentrations appeared to plateau across the dose groups. Higher doses beyond 3 mg/kg did not meaningfully increase the peak serum biomarker concentrations. A single dose of 1 mg/kg SRK-015 only attained approximately half of this peak level. Taken together, these findings suggest that target saturation was attained following a single dose of SRK-015 at 3 mg/kg.

Higher SRK-015 doses were associated with sustained duration of the serum biomarker concentrations at this plateau. Following a single dose of SRK-015 at 10 mg/kg, biomarker concentrations were observed at this level through Day 28, while single doses at 20 mg/kg or 30 mg/kg maintained biomarker concentrations through at least Day 84. This durability of target engagement was further shown in the MAD portion of the trial, during which the plateau was sustained up to at least Day 140 after three doses given once every two weeks at 20 mg/kg or 30 mg/kg.

These PD data indicating durable pharmacodynamic effect, together with the PK data indicating a serum half-life of approximately 23 to 33 days, supports the potential for an infrequent dosing regimen (e.g., once every 4 weeks) for SRK-015.

TOPAZ Phase 2 Proof-of-Concept Trial Design

In the second quarter of 2019, we initiated dosing in our TOPAZ Phase 2 proof-of-concept trial of SRK-015 in SMA.

The trial consists of three distinct cohorts of patients with Type 2 or Type 3 SMA and will evaluate the safety and efficacy of SRK-015 dosed intravenously every four weeks (Q4W) over a 12-month treatment period. All patients in the trial are receiving SRK-015 dosed every four weeks either as a monotherapy or in conjunction with an approved SMN upregulator therapy. Enrollment of a total of 58 patients across the three cohorts was completed in January 2020.

In our view, this approach of evaluating multiple distinct cohorts offers a greater number of opportunities to discern the effects of SRK-015 on clinically meaningful motor function measures across multiple patient subpopulations. It is estimated that patients with Type 2 or Type 3 SMA represent over 85% of the overall patient population. We view each of the cohorts being evaluated in the TOPAZ trial as representing a significant proportion of patients suffering from SMA.

- Cohort 1 has an open-label, single-arm design and enrolled 23 patients ages five through 21 with ambulatory Type 3 SMA. Patients are being treated with 20 mg/kg of SRK-015 Q4W as monotherapy or in conjunction with an approved SMN upregulator therapy that they had started after the patient turned five years old. The primary objectives of the cohort are to assess safety and the mean change from baseline in Revised Hammersmith Scale ("RHS"), over 12 months of treatment. Key secondary assessments include the proportion of patients attaining various thresholds of change from baseline in RHS and change from baseline in 6-minute walk test ("6MWT").

- Cohort 2 has an open-label, single-arm design and enrolled 15 patients ages five through 21 with Type 2 or non-ambulatory Type 3 SMA and who are already receiving treatment with an approved SMN upregulator that they had started after the patient turned five years old. Patients are being treated with 20 mg/kg of SRK-015 Q4W in conjunction with an approved SMN upregulator therapy. The primary objectives of the cohort are to assess safety and the mean change from baseline in HFMSE over 12 months of treatment. Key secondary assessments include the proportion of patients attaining various thresholds of change from baseline in HFMSE and change from baseline in Revised Upper Limb Module ("RULM").

- Cohort 3 has a randomized, double-blind, parallel arm design and enrolled 20 patients with Type 2 SMA who are at least two years of age and initiated treatment with an approved SMN upregulator before five years of age. Patients were randomized 1:1 and are being treated with either 2 mg/kg or 20 mg/kg of SRK-015 Q4W. This cohort will evaluate the effects of SRK-015 in the setting of early intervention with an SMN upregulator therapy. The primary objectives of the cohort are to assess safety and the mean change from baseline in HFMSE over 12 months of treatment. Key secondary measures include the proportion of patients attaining various thresholds of change from baseline in HFMSE and change from baseline in RULM. In cohort 3, a low dose arm of 2 mg/kg has been included for dose exploration purposes. The relationship between drug exposure and therapeutic effect over time may be evaluated by characterizing and comparing the time course of clinical effect for the 2 mg/kg and 20 mg/kg arms.

Preliminary PK/PD Results from TOPAZ Trial

In November 2019, we announced results from a planned preliminary PK/PD analysis, which included data from 29 patients with SMA across all three cohorts of the TOPAZ Phase 2 trial (12 patients in Cohort 1, eight patients in Cohort 2, and nine patients in Cohort 3). These patients had received one dose of SRK-015 and were evaluated for four weeks as of the data cutoff. The preliminary results are as follows:

- Dose-dependent increases of up to 100-fold in serum latent myostatin levels following treatment with SRK-015 (2 mg/kg and 20 mg/kg doses) confirms the presence of latent myostatin in patients with SMA and demonstrates robust target engagement.

- Fold-increases from baseline in serum latent myostatin levels in the first four weeks following SRK-015 treatment were comparable between SMA patients in the TOPAZ trial and healthy adult volunteers in the Phase 1 trial.

- In patients with SMA, SRK-015 displayed a preliminary PK profile exhibiting dose proportionality and low variability, consistent with PK observations from the Phase 1 trial in healthy adult volunteers.

- No clinically significant safety signals had been observed as of the data cutoff for this preliminary PK/PD analysis.

Anticipated Timelines for Safety and Efficacy Results

An interim safety and efficacy analysis of all enrolled patients following six months of treatment exposure is planned for mid-2020. Top-line results for the full 12-month treatment period are expected starting in the fourth quarter of 2020 and through the first quarter of 2021.

The primary efficacy objectives being evaluated in the TOPAZ trial, HFMSE and RHS, are clinically meaningful outcome measures validated for SMA. These endpoints assess motor tasks involving short-term bursts of strength and thus involve fast-twitch fiber function. As the hypothesized effect of myostatin blockade under investigation is to drive increases in fast-twitch fiber function, we believe these endpoints are of direct relevance in assessing the clinical effect of SRK-015.

Our overall approach to the efficacy analysis is informed by SMA disease biology, the anticipated mechanism of action of SRK-015, the effects of SMN upregulators, and available clinical data on SMA. The primary effect of SMN upregulator therapy appears to be to address the SMN deficiency and to modify the disease course; thus, the key in preventing significant motor functional deterioration is intervening at a very young age. For most patients with SMA, however, this window for early intervention is no longer available. As a result, these individuals have already suffered considerable atrophy and motor function impairment. Natural history data indicate that most patients with Type 2 or 3 SMA, other than very young individuals, generally have a stable functional baseline over a 12-month period as evidenced by their HFMSE scores. Indeed, it is unusual to observe a spontaneous improvement of 3 or more points from one's baseline. In addition, a subgroup analysis from the CHERISH trial of nusinersen in later-onset SMA revealed that among the subgroup of patients initiated on therapy after the age of 5 years or older, it was rare (<15%) for such individuals to attain a 3-point or greater improvement from baseline in the HFMSE.

In considering these observations and insights together, we believe that it would be a notable divergence from the otherwise expected course of disease if a substantial proportion of similar patients in the TOPAZ trial (i.e., individuals who were started upon nusinersen therapy at the age of 5 years or older) were to attain a 3-point or greater improvement in the HFMSE or RHS following SRK-015 treatment. Such a finding would offer important evidence of SRK-015's clinical benefit. We view this as being the case regardless of whether SRK-015 was received as a monotherapy or in the background of concomitantly receiving SMN upregulator therapy. It should also be noted that such improvements in motor function would be viewed as representing a clinically meaningful effect. Other analyses, including those evaluating other endpoints, are also planned to further characterize the efficacy of SRK-015.

Other Myostatin Indications

We believe that the role of SRK-015 as a muscle-directed therapy has broad potential beyond SMA, spanning a number of muscle disorders in which fast-twitch fibers may play an important role in motor function. In some settings, we believe that disease-stabilizing therapy may be necessary to address the underlying defect, which can then be complemented by the potential motor function-building benefit of SRK-015. In settings in which the defect may be less

severe and/or the disease may have a slower rate of progression, SRK-015 may have the potential to serve as a monotherapy. Examples of such diseases include (but are not limited to) Pompe disease, Duchenne's muscular dystrophy, X-linked myotubular myopathy, spinal cord injury and other forms of muscle atrophy due to denervation, and amyotrophic lateral sclerosis.

Beyond motor function-building, SRK-015 has the potential to serve as a prophylactic agent to prevent muscle atrophy and associated complications. Examples of such disorders include glucocorticoid-induced muscle atrophy and androgen deprivation therapy-induced atrophy.

There is also increasing recognition of the important role of skeletal muscle in modulating metabolic physiology, highlighting a potential therapeutic opportunity for myostatin blockade. For example, evidence is emerging that blockade of the myostatin pathway can reduce the mass of visceral fat, a significant driver of cardiometabolic pathophysiology. Excessive fat mass and metabolic abnormalities have been observed in many muscle atrophy states, such as SMA and spinal cord injury. More broadly, reducing visceral fat mass, or improving body compositions (e.g., enhanced muscle-to-fat ratios), may be a promising therapeutic strategy to address a wide range of disorders, such as non-alcoholic steatohepatitis ("NASH"), diabetes, and obesity.

Thus, a wide range of potential therapeutic applications may be envisioned for SRK-015. We are considering the investigation of SRK-015 in multiple indications beyond SMA and have efforts underway to evaluate these opportunities (including preclinical and translational research, clinical development and regulatory path assessments, and commercial assessments). We expect to announce our additional indication selection in 2020.

Inhibitor of Latent TGFβ1 Activation Programs

TGFβ1 is also a member of the TGFβ superfamily and increased signaling by TGFβ1 is a key driver of a number of disease-relevant processes, including tissue and organ fibrosis, immune system evasion by cancer cells and bone marrow fibrosis associated with hematological disorders. Historically, selectively targeting TGFβ1 signaling has been challenging due to the inability of both small molecule inhibitors and antibodies to avoid off-target inhibition of other, closely related growth factors, TGFβ2 and TGFβ3. Treatment of animals with these non-selective TGFβ inhibitors has been associated with a range of toxicities, most notably cardiac toxicity. Furthermore, since each of these growth factors signals through the same TGFβ receptor, ALK5, inhibitors of the TGFβ receptor kinase suffer from similar dose-limiting toxicities. Using our proprietary platform, we have generated highly specific and locally acting inhibitors of the activation of TGFβ1 that, in our preclinical studies, showed no detectable inhibition of the activation of TGFβ2 or TGFβ3.

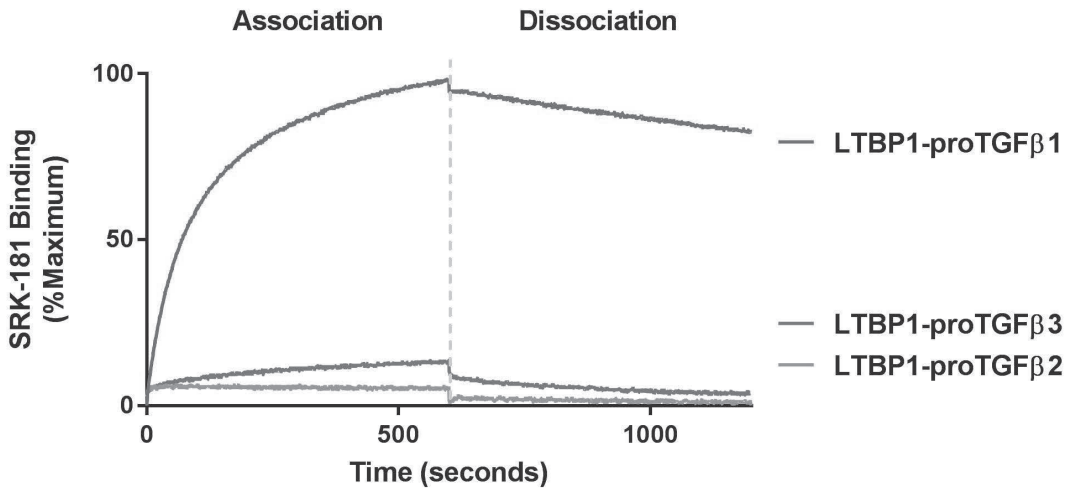
Selection of a Potent and Highly Selective Inhibitor of TGF*β*1 Activation

TGFβ1 is produced by cells as a single protein and is then enzymatically processed by the cells into two distinct and physically separated domains — the mature, active growth factor and the remaining portion of the original protein, referred to as the prodomain — which remains associated with and keeps the growth factor in an inactive state. This complex is further associated with one of a number of "presenting molecules" which when secreted serve to tether the latent precursor in specific locations in the body. TGFβ1 is produced by a variety of cell types, including fibroblasts, which deposit latent TGFβ1 in connective tissue, as well as regulatory T cells and macrophages, which display latent TGFβ1 on their cell surfaces.

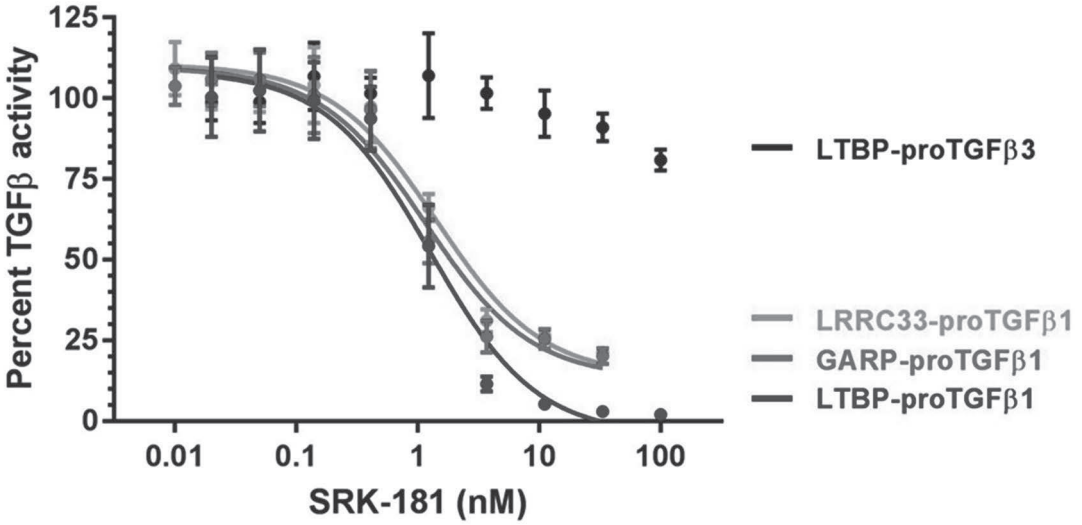
In a seminal peer-reviewed publication in 2011, by solving a high resolution x-ray crystal structure of the latent form of TGFβ1, Dr. Springer elucidated a new understanding of the mechanism that underlies the activation of latent precursor forms of members of the TGFβ superfamily of protein growth factors. This research explained at a molecular level why the secreted form of TGFβ1 is inactive. The prodomain, though physically separated from the mature growth factor domain, forms a "cage" around the active form of TGFβ1, blocking the ability of the growth factor to signal through its receptor. Integrin proteins are able to unlock the "cage" by binding to the prodomain of the latent TGFβ1 complex and applying force to pull the complex open, allowing the mature growth factor to be released and signal in its microenvironment. While mature TGFβ1 shares a high degree of structural similarity with its closely related family members, TGFβ2 and TGFβ3, their respective cages are structurally diverse. By taking advantage of the differences

among the prodomains, together with our understanding of the activation mechanism and ability to recapitulate the activation mechanism *in vitro*, we were able to identify multiple highly selective inhibitors of the activation of latent TGFβ1.

In March 2019, we selected SRK-181 as a product candidate in our TGFβ1 cancer immunotherapy program based on the strength of preclinical data and human translational insights. *In vitro* and *in vivo* studies of SRK-181 showed that it binds to latent TGFβ1 with high affinity and high selectivity, which is evidenced by minimal or no binding to latent TGFβ2 or latent TGFβ3 isoforms. The selectivity and *in vitro* inhibitory activity observed for SRK-181 is shown in the figures below.



SRK-181 selectively binds to proTGFβ1complexes with minimal or no binding to proTGFβ2 or proTGFβ3 complexes.



SRK-181 selectively inhibits TGFβ1 activation in multiple presentation contexts with no inhibition of TGFβ3 activation

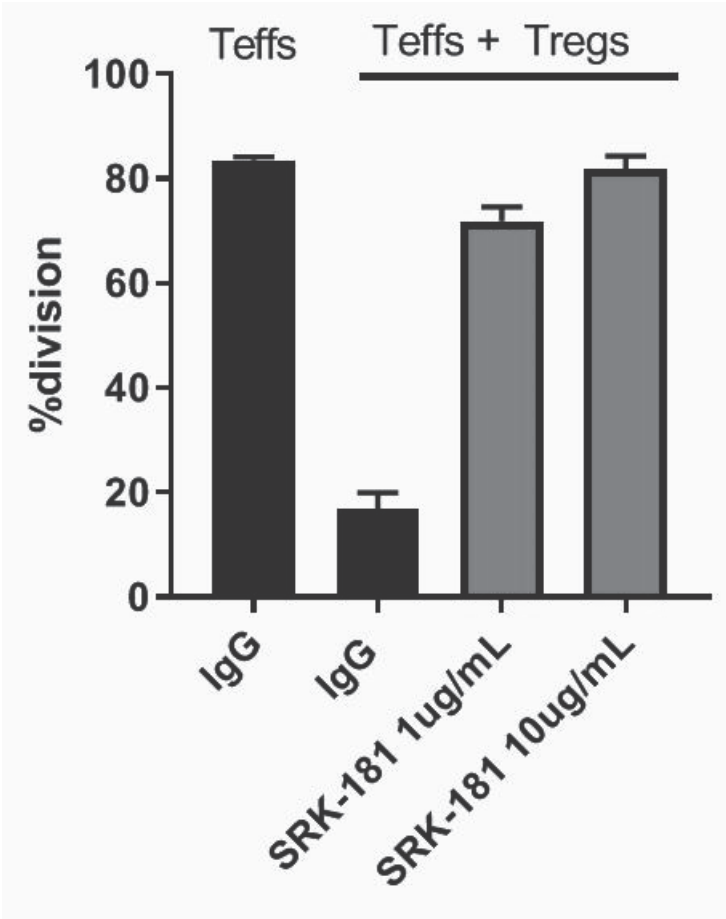
TGFβ1 in Cancer Therapy

Based on our preclinical results, we believe that specific inhibition of TGFβ1 may have a significant impact on the treatment of patients in certain oncology settings.

For example, multiple published peer-reviewed studies have implicated TGFβ signaling in primary resistance to CPI therapies. Immune checkpoints are cellular mechanisms that act as a brake on the immune system, and expression of these proteins in the tumor microenvironment creates an immunosuppressive environment that allows tumor cells to evade being killed by the immune system. Immune checkpoint proteins, such as PD-1/PD-L1, have therefore become key therapeutic targets in the tumor microenvironment. By inhibiting these proteins, the brakes on the immune system are released, allowing the T cells to kill the cancer cells. There are currently multiple approved immunotherapies that target the PD-1/PD-L1 pathway, including pembrolizumab, marketed as Keytruda®, nivolumab, marketed as Opdivo®, and atezolizumab, marketed as Tecentriq®.

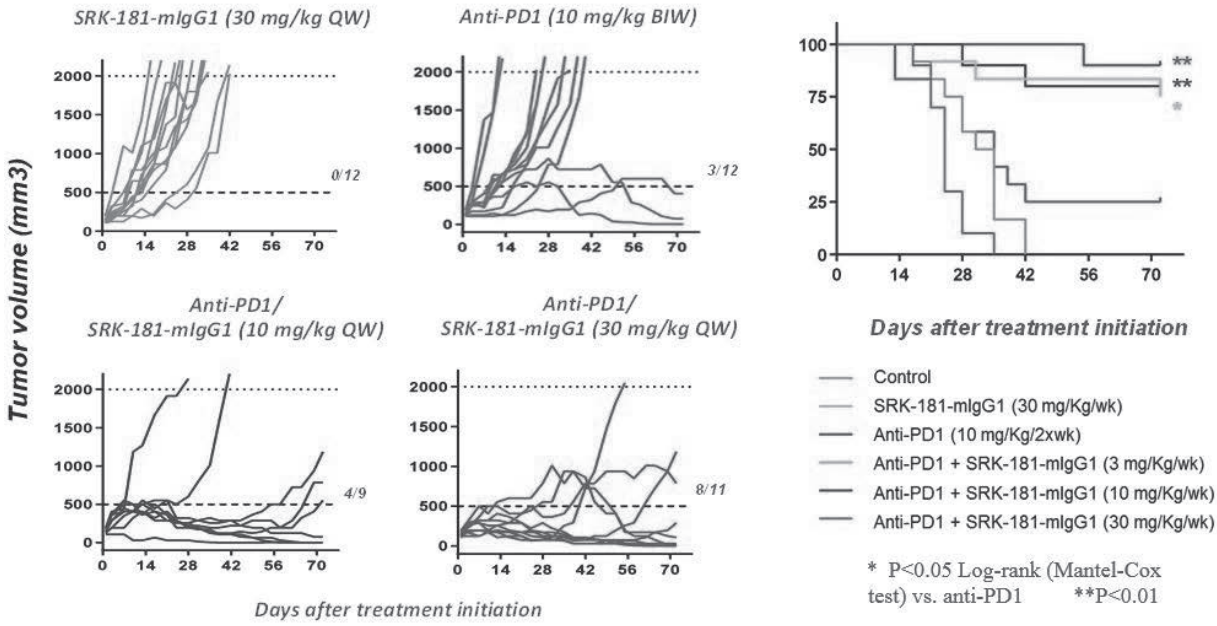
A significant proportion of patients, in many cases the majority, fail to respond to checkpoint inhibition because they have what appears to be a pre-existing, or primary, resistance to immunotherapy. Other patients' cancers appear to initially respond but subsequently progress. Gene expression analysis of pre-treatment melanoma tumors identified multiple TGFβ-related signaling signatures associated with pre-existing or primary resistance to anti-PD1 antibody therapy. Similarly, it has also been reported that retrospective pathway analysis of tumor samples from an atezolizumab bladder cancer trial identified the TGFβ pathway as a major determinant of primary resistance to atezolizumab. The combination of atezolizumab with an anti-TGFβ antibody in the mouse EMT6 syngeneic breast tumor model, increased the number of complete responses to 70%, from 10% and 0% with treatment by atezolizumab or the anti-TGFβ antibody alone, respectively. Our analysis of publicly available human tumor data has identified TGFβ1 as the predominant TGFβ isoform expressed in many human tumors, in particular for those cancers, such as bladder, lung and melanoma, where CPI therapies are already approved.

We have conducted both *in vitro* and *in vivo* studies with our antibodies in order to evaluate whether our inhibitors of the activation of latent TGFβ1 may be effective in cancer immunotherapy. *In vitro*, we have observed that, by inhibiting the activation of latent TGFβ1, our antibodies suppressed the effect that human regulatory T cells have on the proliferation of human effector T cells.



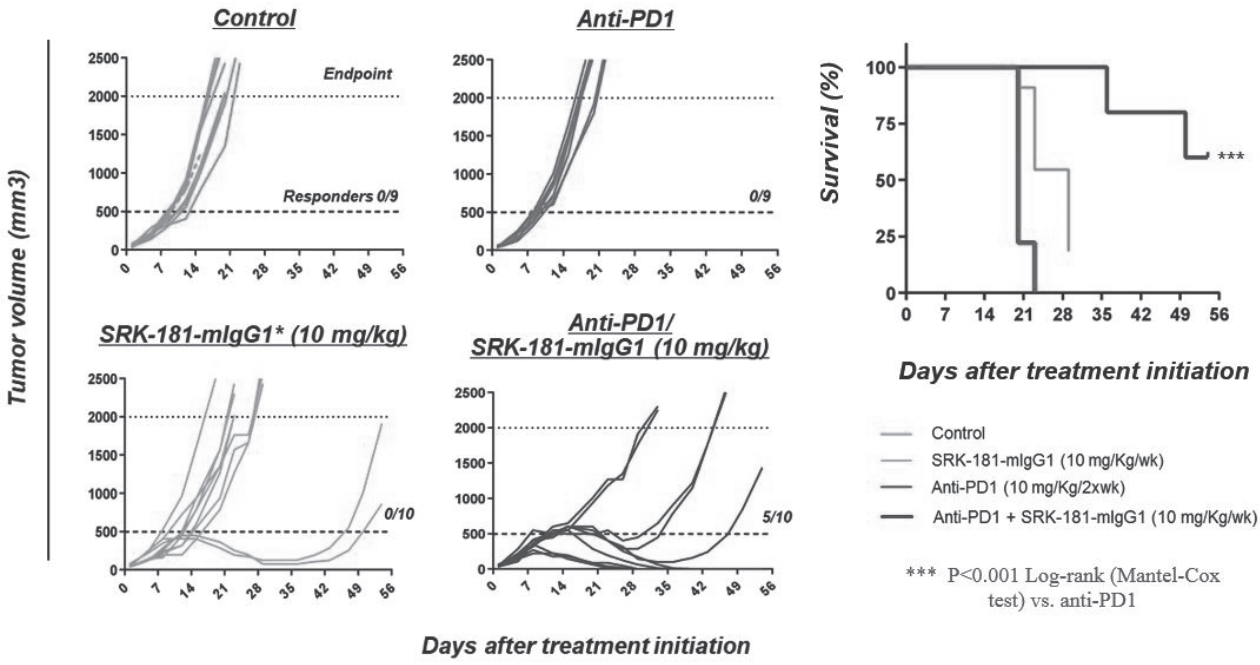
SRK-181 selectively inhibits regulatory T cell (Treg)-mediated suppression of effector T cell (Teff) proliferation

In vivo, in a number of preclinical models of cancer immunotherapy that are otherwise refractory to checkpoint inhibition, we have observed that co-administration of SRK-181-mIgG1, the murine chimeric variant of SRK-181, with an anti-PD1 antibody renders these tumor models sensitive to the combination treatment. As examples, representative tumor growth and survival data from studies conducted in two mouse syngeneic tumor models that reflect the primary resistance to CPI therapies observed in human cancers are shown in the following figures. We have observed that these models, the MBT-2 bladder cancer model and the Cloudman S91 melanoma model, are poorly or unresponsive to single agent treatment with either anti-PD1 or SRK-181-mIgG1, with little or no effect on tumor growth. However, the combination of these two agents (anti-PD1 and SRK-181-mIgG1) resulted in synergistic tumor growth delay as manifested by either complete responses or tumor control. Furthermore, the combination treatment led to significant survival benefit in both models.



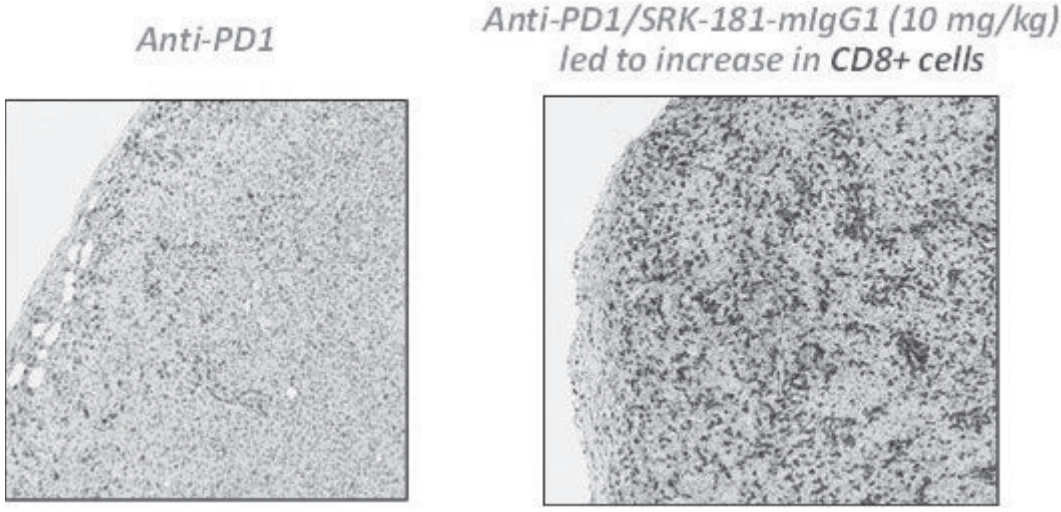
SRK-181-mIgG1 renders the syngeneic Cloudman S91 melanoma model susceptible to anti-PD1 CPI therapy, as measured by tumor regression and growth control, and survival benefit

In addition, this observed effect on tumor regression and survival benefit was also observed in the EMT6 breast cancer model, which expresses both TGFβ1 and TGFβ3, suggesting that potently inhibiting TGFβ1 alone is sufficient for enabling a synergistic anti-tumor response in conjunction with anti-PD-1 antibody treatment.



SRK-181-mIgG1 renders the syngeneic EMT6 breast cancer model susceptible to anti-PD1 CPI therapy, as measured by tumor regression and growth control, and survival benefit

Furthermore, in *in vivo* mechanistic studies of the same tumor models, we observed an increase in the number of effector T cells in tumors from mice treated with the SRK-181-mIgG1/anti-PD1 combination versus control or single agent treatment, suggesting that overcoming innate CPI resistance involves enhanced presence and activity of killer T cells. CD8+ population expanded to an average of 34% of the tumor's immune cells from a control average of 3.5%. We also observed a decrease in intratumoral immunosuppressive myeloid cells – a reduction in TAM/MDSC population to 14% of the tumor's immune cells from a control average of 47%.



Combination treatment of MBT-2 tumor bearing mice with SRK-181-mIgG1 and an anti-PD1 antibody causes an increase in intra-tumoral effector T cells and a decrease in intratumoral immunosuppressive myeloid cells

We have demonstrated preclinically the potential of SRK-181 for reduced toxicity that has historically limited drug exposure with non-selective TGFβ inhibition. In a pilot toxicology study, treatment of adult rats with SRK-181 up to a weekly dose of 100mg/kg for four weeks had an improved toxicity profile and avoided the cardiovascular toxicity observed with a non-selective TGFβ antibody and an ALK5 inhibitor. The no observed adverse effect level ("NOAEL") for SRK-181 was the highest dose evaluated (100 mg/kg QW). In GLP-toxicology studies, no SRK-181 related adverse effects were observed up to the highest evaluated dose of 200 mg/kg per week in a four-week rat study and 300 mg/kg per week in a four-week non-human primate study.

Phase 1 Dose Escalation and Dose Expansion Clinical Trial

A Phase 1, open-label, proof-of-concept trial evaluating the safety, tolerability, PK/PD, and efficacy of SRK-181 in patients with locally advanced or metastatic solid tumors was initiated in the first quarter of 2020. The two-part trial consists of a dose escalation portion (Part A) for SRK-181 as both a single agent and in combination with an approved anti-PD-(L)1 antibody therapy, followed by a dose expansion portion (Part B) evaluating SRK-181 in combination with an approved anti-PD-(L)1 antibody therapy in multiple tumor-specific cohorts, including non-small cell lung cancer, urothelial carcinoma, and cutaneous melanoma. Patients must have locally advanced or metastatic solid tumors with primary resistance to anti-PD-(L)1 antibody therapy.

Part A: The dose escalation portion of this trial will assess the safety and tolerability of SRK-181 as a single agent (Part A1) and in combination with CPI therapy (Part A2) and will be conducted in a staggered fashion. It will also evaluate biomarkers as potential PD indicators of effect to SRK-181.

Part B: The dose expansion portion of the trial will evaluate the anti-tumor activity of SRK-181 in combination with CPI therapy in various solid tumors for which anti-PD-(L)1 antibody therapy is approved.

The Phase 1 trial was initiated in the first quarter of 2020 and initial clinical data, such as biomarker data, from Part A of the trial is expected in the second half of 2020 with clinical response and safety data from Part B of the trial anticipated throughout 2021.

Potential Applications of SRK-181 in Additional Oncology Settings

Furthermore, in addition to cancer immunotherapy, we believe SRK-181 has the potential for use in additional oncology settings. For example, we are currently evaluating SRK-181 in models of myelofibrosis, an oncology hematological disorder wherein fibrosis of the bone marrow represents an unmet medical need.

Multiple peer-reviewed studies implicate TGFβ1 as a driver of fibrotic progression in myelofibrosis. Myelofibrosis affects between 17,000 and 18,000 patients in the U.S. with significant morbidity and mortality. The only currently approved treatment for myelofibrosis, a JAK2 inhibitor, provides symptomatic benefit, but only modest reductions in bone marrow fibrosis. Therefore, we believe that significant unmet need remains for new therapeutic options.

TGFβ1 is produced by multiple cell types in the bone marrow microenvironment, including myofibroblasts, megakaryocytes and myeloid cells, and it has been shown to be upregulated in both human patient samples and preclinical mouse models of myelofibrosis. Inhibition of TGFβ signaling with an ALK5 inhibitor reduced splenomegaly, collagen deposition and bone marrow fibrosis in a preclinical model of myelofibrosis. Furthermore, reconstitution of bone marrow with TGFβ1 knockout bone marrow stem cells in a model of hematological disease protected animals from bone marrow fibrosis, suggesting that TGFβ1 expression is necessary for disease pathogenesis.

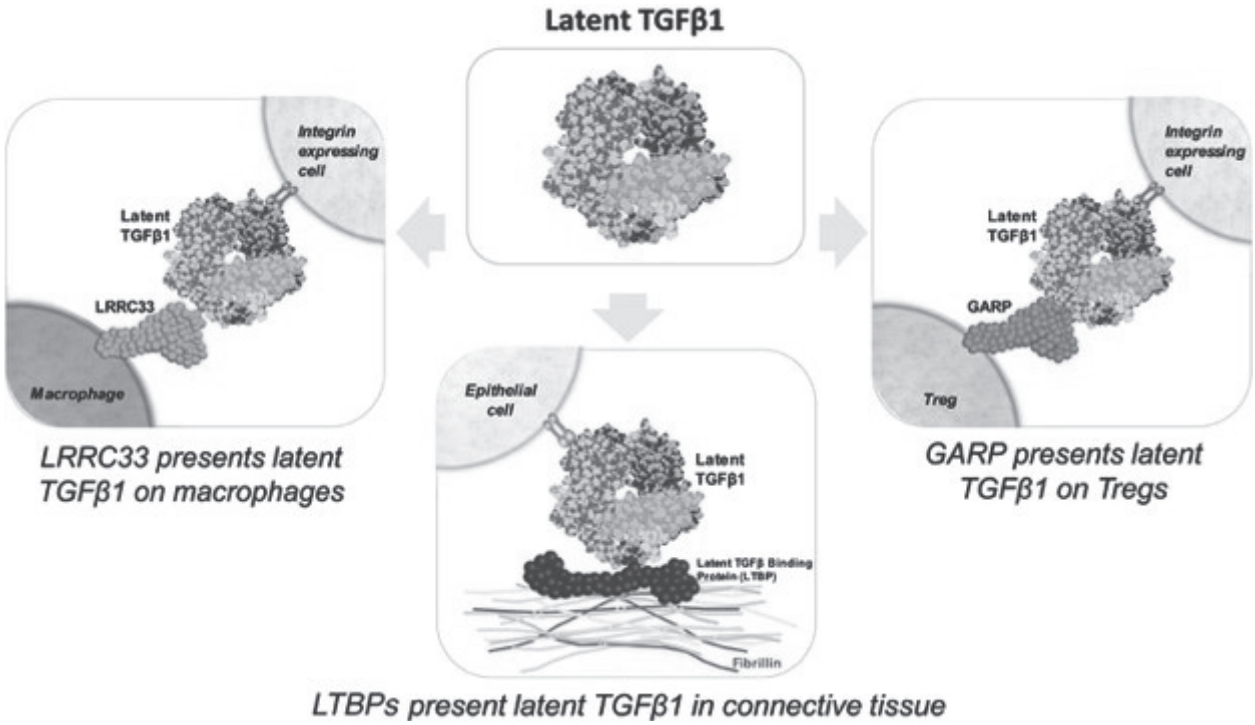
TGFβ1 in Fibrosis

Fibrosis is a pathological feature of disease which can occur in virtually all organs, characterized by excessive accumulation of extracellular matrix in the affected tissue and accounts for substantial morbidity and mortality. The TGFβ signaling pathway as a central regulator of fibrosis has been well-established. Indeed, TGFβ is upregulated in many animal models of fibrosis, and overexpression of TGFβ *in vivo* induces fibrotic changes. Furthermore, TGFβ inhibition in animal models has been shown to reduce fibrosis in models of hepatic, renal and cardiac fibrosis. Additionally, fresolisumab, an inhibitor of all three TGFβ isoforms, was evaluated in an open-label clinical trial involving patients with systemic sclerosis, a fibrotic connective tissue disease. Improvement in clinical skin disease as measured by the modified Rodnan skin score, a commonly used measure of skin thickness, was observed, although bleeding episodes were also reported in this trial. These data suggest that novel approaches to targeting TGFβ signaling may have broad applicability to the treatment of fibrotic disease.

For our TGFβ inhibitor discovery and development efforts aimed at the treatment of fibrosis, certain context-independent and context-dependent antibodies that have been observed to specifically inhibit TGFβ1 activation are the subject of our Gilead Collaboration Agreement, and their further optimization, characterization, and anticipated product candidate development will take place in the context of this strategic collaboration. In December 2019, we announced the achievement of a $25 million preclinical milestone under the Gilead Collaboration Agreement for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies in the most advanced program of the collaboration.

Context-dependent TGFβ1 Inhibitors

As mentioned, when latent TGFβ1 is secreted from cells, it is further associated with a third protein, referred to as a presenting molecule. The presenting molecules are covalently bound to the prodomain and serve to tether the latent TGFβ1 complex in a particular microenvironment. Unlike TGFβ1, a given presenting molecule's expression pattern is restricted to particular cellular and tissue environments. For example, the presenting molecule GARP is found primarily on regulatory T cells, the presenting molecules LTBP1 and LTBP3 are localized to the connective tissue in the extracellular matrix, and the presenting molecule LRRC33 is found primarily on certain myeloid lineage cells such as macrophages.



Using our proprietary platform, we are also able to identify antibodies that selectively inhibit the activation of latent TGFβ1 both independently—our context-independent program—as well as selectively in the context of specific presenting molecules—our context-dependent programs—which we refer to as context-dependent inhibition. For example, we have identified antibodies that specifically bind to and inhibit the activation of GARP-presented latent TGFβ1 on regulatory T cells with no detectable binding to latent TGFβ1 associated with other presenting molecules. These antibodies are the subject of our license agreement with Janssen.

We also have an active discovery program to identify antibodies that specifically bind to and inhibit the activation of LRRC33-presented latent TGFβ1 with no cross-reactivity to LTBP1-, LTBP3- or GARP- presented latent TGFβ1. We believe that such antibodies may have therapeutic potential for specific oncology and cancer immunotherapy applications where selective modulation of myeloid lineage cells is desirable, for example inhibition of tumor-associated macrophages. In addition, we have a related program to identify antibodies that specifically inhibit the activation of both LRRC33- and GARP-presented latent TGFβ1, with no cross-reactivity to LTBP1- or LTBP3-presented latent TGFβ1. We believe such antibodies could have broad inhibitory activity against TGFβ1 in the immune system for cancer immunotherapy, while avoiding inhibition of TGFβ1 in other tissues. We have identified antibodies that potentially meet the desired binding specificities, and these are currently undergoing characterization and further optimization.

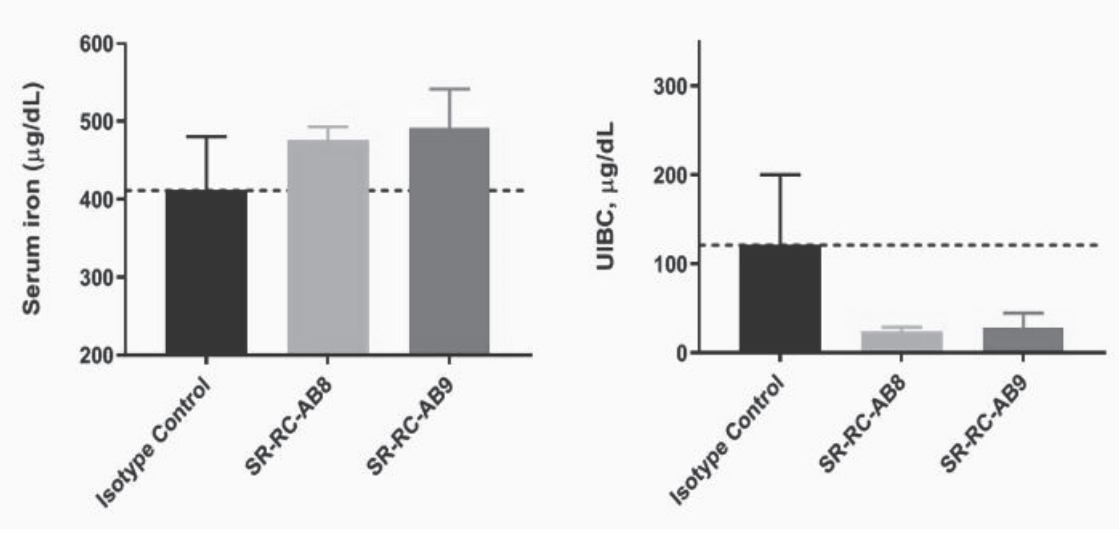
BMP6 Signaling Program

We believe that liver-selective inhibition of BMP6 signaling could provide a way to target a variety of iron-restricted anemias, including anemia of chronic kidney disease, anemia of cancer and anemia of chronic inflammation.

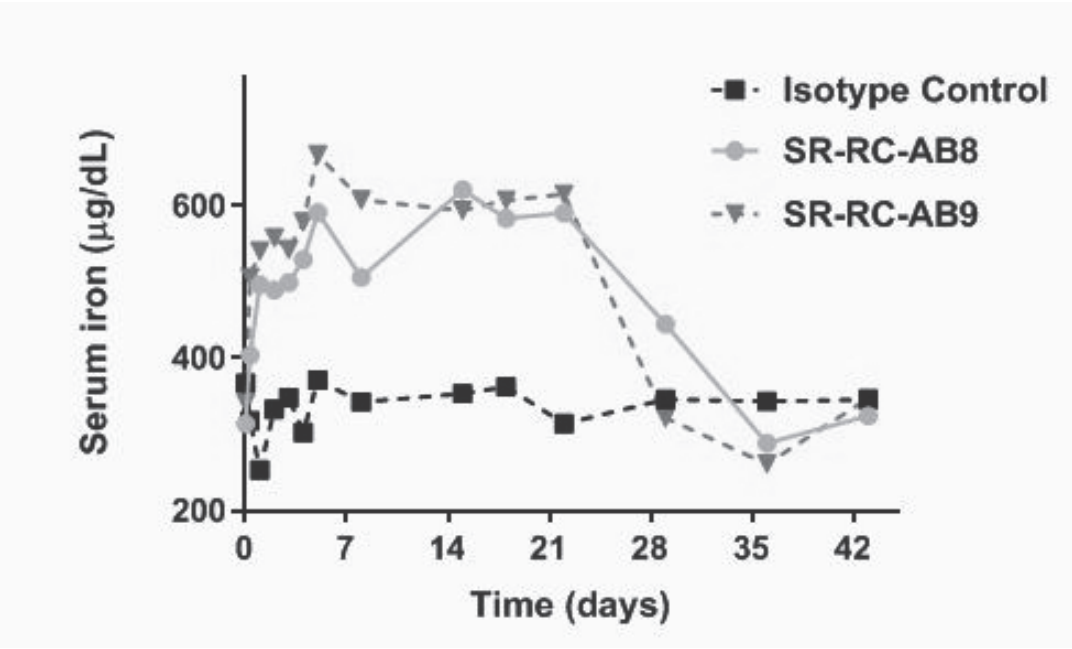
BMPs are a broad subfamily of growth factors in the TGFβ superfamily originally discovered by their ability to induce the formation of bone and cartilage. Beyond their association with bone, like many other growth factors, the BMPs are involved in a diverse set of biological processes. For example, while BMP6 plays roles in many different biologies, including fat metabolism and ovarian physiology, in the liver it functions as a critical control point in iron modulation in humans via regulation of hepcidin, a central regulator of iron homeostasis. Traditional approaches to inhibiting the signaling of BMP6 systemically would likely perturb the numerous different physiological processes in which BMP6 is involved. While the details of BMP6 activation are different from myostatin and TGFβ1, the activity of BMP6 in the

liver microenvironment is dependent on the presence of a co-receptor molecule, RGMc, also known as hemojuvelin, which is required for BMP6 signaling upon binding to its receptor. RGMc is a member of a small family of proteins that include RGMa and RGMb. While each of these family members shares significant structural homology, particularly across their BMP binding domains, their physiological roles are quite different. RGMa and RGMb are reported to have roles in nervous system biology, immunity, inflammation, angiogenesis, and growth. Unlike RGMa and RGMb, RGMc's known function is localized to hepatocytes. As such identification of RGMc selective-antibodies that do not bind to RGMa or RGMb could provide the potential for liver-specific modulation of BMP6 biology. Utilizing our structural biology insights into BMP6 and its co-receptors, we have identified highly specific inhibitors of RGMc's interaction with BMP6.

Further affinity optimization of antibodies initially discovered in this program has improved the *in vitro* and *in vivo* potency of these molecules to the point where our leading antibodies have been observed to elicit an increase in serum iron and concomitant decrease in unsaturated iron binding capacity with *in vivo* doses as low as 0.2 mg/Kg in rats, and where a single 20 mg/Kg dose can maintain these effects for greater than 3 weeks.



SR-RC-AB8 and SR-RC-AB9, two of our selective BMP6 signaling inhibitors, increased serum iron in rats as compared to control (left side) and reduced unsaturated iron binding capacity ("UIBC"), in healthy rats (right side). Serum samples were collected 24 hours after a single dose of antibody



Single 20 mg/Kg doses of SR-RC-AB8 and SR-RC-AB9, two of our selective BMP6 signaling inhibitors, maintained increased serum iron in rats for at least 21 days.

We are currently evaluating a limited number of our optimized inhibitors of BMP6 signaling in preclinical disease models of iron-restricted anemia and plan to nominate a product candidate in 2020.

License Agreements

Gilead Collaboration

On December 19, 2018 (the "Effective Date"), we entered into the Gilead Collaboration Agreement to discover and develop specific inhibitors of TGFβ activation focused on the treatment of fibrotic diseases. Under the collaboration, Gilead has exclusive options to license worldwide rights to product candidates that emerge from three of our TGFβ programs. Pursuant to the Gilead Collaboration Agreement, we will conduct certain research and pre-clinical development activities other than in the field of oncology (as further described in the Gilead Collaboration Agreement, the Field, in accordance with a pre-determined research plan. We are responsible for antibody discovery and preclinical research through product candidate nomination, after which, upon exercising the option for a program, Gilead will be responsible for the program's further preclinical and clinical development and commercialization.

In connection with the Gilead Collaboration Agreement, we received an upfront payment of $50 million and an equity investment of $30 million at a purchase price of $30.60 per share, which represented a 36% premium to the prior day closing trading price of our common stock.

In December 2019, we achieved a $25 million preclinical milestone under the Gilead Collaboration Agreement for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies.

We will conduct activities under the Gilead Collaboration Agreement during the period beginning on the Effective Date and ending on the earliest to occur of (a) the date that a selected development candidate for such Program is approved, (b) the third anniversary of the Effective Date, or (c) the effective date of termination of the Gilead Collaboration

Agreement (the "Research Collaboration Term"). Gilead has an exclusive option (with respect to each Program, an Option, exercisable in its discretion, to enter into a license agreement with us with respect to any Program. Such Option may be exercised by Gilead at any time from the Effective Date through a date that is 90 days following the expiration of the Research Collaboration Term for a given Program, unless the Program is terminated earlier (the "Option Exercise Period"). The Gilead Collaboration Agreement will remain in effect, on a Program-by-Program basis, until Gilead exercises its Option with respect to a given Program or until expiration of the applicable Option Exercise Period, whichever is earlier. After an indicated period of time following the Effective Date, Gilead may terminate the Gilead Collaboration Agreement in its sole discretion and in its entirety or on a Program-by-Program basis, with prior written notice as required pursuant to the Gilead Collaboration Agreement. Gilead will also be deemed to have terminated the Gilead Collaboration Agreement immediately with respect to a Program, without prior notice, in the event that Gilead exercises its decision making authority not to approve for the second time a development candidate nomination which satisfies the applicable development criteria as a selected development candidate for such Program. Other termination rights are as specified in the Gilead Collaboration Agreement.

Form of License Agreement

Upon Gilead's exercise of an Option under the Gilead Collaboration Agreement, the parties will enter into an agreed form of license for the applicable Program (the "License Agreement"), under which Gilead will be responsible for development and commercialization activities for product candidates arising out of such Program.

Under each License Agreement, we will grant Gilead an exclusive license for the development and commercialization of licensed antibodies and licensed products in the Field. In partial consideration of the exclusive license granted to Gilead, Gilead will make non-refundable and non-creditable, milestone payments upon the first achievement of certain research and development milestone events and certain commercial milestone events with respect to a licensed product. The total potential aggregate Option exercise fee, development, regulatory and commercial milestone payments with respect to each Program is $475 million, or a total of $1,425 million in potential payments aggregated across all three Programs. Additionally, in partial consideration of the rights granted to Gilead pursuant to the License Agreement, Gilead will pay us certain tiered royalties at a rate ranging from the high single-digits to the low double-digits (depending on the amount of net sales) on each licensed product in a given calendar year, on a country-by-country basis.

Any License Agreement will remain in effect, on a licensed product-by-licensed product basis and country-by-country basis, until the expiration of the royalty term for such licensed product in such country (the "License Agreement Term"). Unless earlier terminated, the License Agreement Term shall expire in its entirety upon the expiration of the last to expire royalty term under the License Agreement.

License Agreement with Janssen

On December 17, 2013 we entered into an option and license agreement with Janssen (the "Janssen Agreement"). Pursuant to the Janssen Agreement, Janssen funded our drug discovery research to identify molecules with either one or two pharmacological profiles, over a two-year period beginning on December 17, 2013 (the "collaboration period").

As a result of this agreement, Janssen exercised its option in December 2015 to exclusively license certain collaboration molecules for one pharmacological profile, the selective inhibition of TGFβ1 in the context of regulatory T cells, and our obligations under the program plan for the molecule and related pharmacological profile ceased and Janssen assumed full responsibility for further development of the molecules at its sole cost.

Janssen is obligated to pay us up to $25 million upon the achievement of specified development milestones and up to $97 million upon the achievement of specified regulatory milestones. In addition, for any licensed product, Janssen is required to pay to us up to $130 million upon the achievement of specified annual net sales thresholds. For a period commencing on the first commercial sale of a product, on a product-by-product and country-by-country basis, until the latest to occur of (i) the expiration date of the last valid claim within the licensed patent rights covering the licensed product, (ii) the tenth anniversary date of the first commercial sale of a licensed product, or (iii) the termination or

expiration of regulatory exclusivity for a licensed product, such period the royalty period, Janssen is required to pay to us, single digit percentage tiered royalties based on annual net sales thresholds.

The Janssen Agreement will expire on a country-by-country basis on the expiration of the last royalty period for a licensed product within such country. Janssen has the right to terminate the Janssen Agreement, in whole or in part, without cause upon 90 days written notice to us. In addition, either we, or Janssen may terminate the Janssen Agreement if the other party commits a material breach of the agreement and fails to cure such breach within 60 days (or 30 days in the case of a failure to make any payment) after written notice is provided, or, upon the other party's bankruptcy, insolvency, dissolution or winding up. Upon termination, any licensed product reverts to us and if Janssen has commenced clinical trials for such licensed product, upon commercialization of such licensed product, we will be required to pay Janssen single digit percentage tiered royalties on such licensed product based on annual net sales thresholds.

License Agreement with Children's Medical Corporation

On December 17, 2013, we entered into an exclusive license agreement (the "CMCC Agreement") with Children's Medical Center Corporation ("CMCC"), to gain exclusive control over co-owned patent rights related to our platform technology. Under the CMCC Agreement, we received an exclusive worldwide license to CMCC's rights in certain patent rights jointly owned by us and CMCC, to develop and commercialize any product or process that but for the licenses granted to us under the CMCC Agreement would infringe such patent rights, a licensed product and licensed process, respectively, for any use. We are entitled to sublicense the rights granted to us under the CMCC Agreement. These licenses and rights are subject to certain limitations and retained rights, including retained rights to practice and use the patent rights for research, educational, clinical and charitable purposes. In addition, the CMCC Agreement obligates us to meeting certain diligence milestones, including obligations to raise funds, seek collaborations and initiate discovery efforts.

As consideration for the license, we paid CMCC a non-refundable license fee of $5,000 and issued to CMCC 76,500 shares of common stock. We must pay CMCC annual license maintenance fees, which were $5,000 through 2016 and increased to $10,000 for 2017 and each year thereafter. We will also be responsible for up to $1.3 million of development and regulatory milestone payments through the first regulatory approval of a licensed product, tiered royalty payments of low single-digit percentages on net sales of licensed products in the event that we realize sales from products covered by the license agreement, and between 10% and 20% of non-royalty income attributable to a sublicense of the CMCC rights. Such products include products developed using our proprietary platform that are covered by a valid claim contained in any patent under the license agreement. Amounts paid to CMCC are recorded as research and development expense in the statement of operations. The royalty term will terminate on the expiration date of the last valid claim within the licensed patent rights.

CMCC may terminate the CMCC Agreement if we commit a breach of the agreement, and fail to cure such breach within 60 days (or 30 days in the case of our failure to make any payment) after written notice is provided, or immediately upon our bankruptcy, insolvency, dissolution or winding up, or upon 30 days' notice if we bring patent challenges relating to any patent families licensed by us under the CMCC Agreement. In addition, we may terminate the CMCC Agreement for convenience upon three months prior written notice to CMCC. Upon expiration of the CMCC Agreement, we will have a worldwide, perpetual, irrevocable, sublicensable license to the intellectual property previously covered by the CMCC Agreement.

Adimab Agreement

On March 12, 2019, we entered into an amended and restated collaboration agreement ("Adimab Agreement") with Adimab, LLC ("Adimab"). Under the Adimab Agreement, as amended, we selected a number of biological targets against which Adimab used its proprietary platform technology to discover and/or optimize antibodies based upon mutually agreed upon research plans, and we have the ability to select a specified number of additional biological targets against which Adimab will provide additional antibody discovery and optimization services. During the research term and evaluation term for a given research program with Adimab ("Research Program"), we have a non-exclusive

worldwide license under Adimab's technology to perform certain research activities and to evaluate the program antibodies to determine whether we want to exercise our option to obtain an exclusive license to exploit such antibodies (a "Development and Commercialization Option").

Pursuant to the Adimab Agreement, we previously paid Adimab a one-time, non-creditable, non-refundable technology access fee. We are also obligated to make certain technical milestone payments to Adimab on a Research Program-by-Research Program basis. Upon exercise of a Development and Commercialization Option, we are obligated to pay to Adimab a non-creditable, nonrefundable option exercise fee of either (i) a low seven-digit dollar amount or (ii) a mid six-digit dollar amount, based on the antibodies in the given Research Program, plus, in either case, an amount equal to any technical milestone payment which was not previously paid with respect to such Research Program and less, in either case, any option extension fees paid with respect to such Research Program. On a Product (as defined in the Adimab Agreement)-by-Product basis, we will pay Adimab upon the achievement of various clinical and regulatory milestone events with total milestone payments not to exceed mid-teen millions in the aggregate for a given Product. For any Product that is commercialized, on a country-by-country and Product-by-Product basis, we are obligated to pay to Adimab a low-to-mid single-digit percentage of annual worldwide net sales of such Product during the applicable royalty period in each country.

SRK-181 is subject to the terms of the Adimab Agreement, and in March 2019, we exercised our Development and Commercialization Option for the Research Program from which SRK-181 was generated. In January 2020, we exercised our Development and Commercialization Option for an additional Research Program.

Intellectual Property

Our commercial success depends in part on our ability to protect intellectual property for our product candidates, including SRK-015 and SRK-181, and related methods, as well as our novel approach and proprietary platform for generating monoclonal antibodies; to secure freedom-to-operate to enable commercialization of our product candidates, if approved; and to prevent others from infringing upon our patent rights. Our policy is to seek to protect our intellectual property position by filing patent applications in key jurisdictions, including the U.S., Europe, Canada, Japan and Australia, covering our proprietary technology, inventions and improvements that are important to innovate, develop, sustain and implement our business.

We file patent applications directed to compositions comprising our antibodies, classes of antibodies covering our product candidates, use of such antibodies for treating diseases, as well as related manufacturing methods. As of March 1, 2020, we have 21 international patent families (PCT filings) pending across multiple programs. Among the pending families, twelve have been nationalized, in which seven applications have matured into U.S. issued patents, four granted in Australia, one granted in Singapore, and one granted in South Africa. Collectively, there are 137 national utility applications pending. In addition, there are three patent family filings which are in the priority year. We continue to review and harvest new inventions for new patent filings.

We have no contested proceedings relating to any patents at this time, but we cannot provide any assurances that we will not have such proceedings at a later date.

Ownership and IP Rights

Our earliest patent family, PCT/US2013/068613 (published as WO 2014/074532), is jointly owned by us and CMCC. CMCC is the assignee of the intellectual property rights transferred from two of our co-founders, Drs. Timothy A. Springer and Leonard I. Zon. The portion of rights owned by CMCC is exclusively licensed to us. We are the sole legal owner of all subsequent patent families we have to date.

As described, a portion of our TGFβ technology is out-licensed to Janssen. This is carved out as PCT/US2017/042162 (published as WO 2018/013939), which has been nationalized. The licensee takes lead in the prosecution of this patent

family. The licensee also has a non-exclusive license to our platform technology to enable their development in the licensed field.

Brief descriptions of our patent families are provided below, with projected patent terms excluding any possible patent term adjustments or extensions.

Platform

Our novel approach to generating selective modulators of supracellular activation of growth factors is broadly embodied in our two earliest "platform" patent families, PCT/US2013/068613 (published as WO 2014/074532) and PCT/US2014/036933 (published as WO 2014/182676). These patent families are directed to methods for modulating the activation of the TGFβ superfamily of growth factors by using a monoclonal antibody that specifically targets an inactive form of the growth factor, thereby preventing activation (e.g., release) of mature growth factor. The TGFβ superfamily is a group of more than 30 related growth factors/cytokines that mediate diverse biological processes and includes TGFβ1 and myostatin (also known as GDF-8). Issued U.S. patents in the platform families include: U.S. Patents Nos. 9,573,995 (issued 02/21/2017); 9,758,576 (issued 09/12/2017); 9,580,500 (issued 02/28/2017); 9,399,676 (issued 07/26/2016) and 9,758,577 (issued 09/12/2017). These patents are projected to expire in 2034.

Specifically, U.S. Patent No. 9,573,995 has issued composition of matter claims directed to an antibody that specifically binds to GARP associated with a human TGFβ1 LAP complex.

U.S. Patent No. 9,758,576 has issued composition of matter claims directed to an isolated monoclonal antibody, or a fragment thereof, that specifically binds the prodomain of a pro/latent GDF-8/myostatincomplex, thereby preventing proteolytic cleavage between residues Arg 75 and Asp 76 of GDF-8/myostatin prodomain, so as to inhibit the release of mature GDF-8/myostatin growth factor from the complex.

U.S. Patent No. 9,580,500 has issued claims directed to phage display library-based antibody production methods for identifying an antibody that binds a GARP/proTGFβ1 complex.

U.S. Patent No. 9,399,676 has issued claims directed to phage display library-based antibody production methods for identifying an antibody that binds a pro/latent GDF-8 complex that has been subjected to enzymatic cleavage. Related product-by-process claims are included in issued U.S. Patent No. 9,758,577.

In addition, U.S. Application Serial No. 15/404,663 has been recently allowed. The allowed claims broadly cover manufacturing methods for a pharmaceutical composition containing an antibody that binds a large latent complex of TGFβ, thereby modulating TGFβ signaling.

Myostatin Activation Inhibitors

Five patent families have been filed to date to cover proprietary myostatin inhibitors and their use in the treatment of various muscle diseases. Patent prosecution of these five pending patent families is ongoing but relatively early.

Two families are directed to composition of matter claims that cover our proprietary antibodies. PCT/US2015/059468 (published as WO 2016/073853) broadly covers a class of monoclonal antibodies that specifically bind inactive precursors thereby preventing activation of myostatin. This patent family is projected to expire in November 2035. U.S. Patent 10,307,480 has issued in June 2019, with issued claims directed to Scholar Rock proprietary antibodies that selectively inhibit myostatin activation, including 29H4, the parental clone of SRK-015, and variants. A second family, PCT/US2016/052014 (published as WO 2017/049011), discloses the specific amino acid sequence of SRK-015 and is projected to expire in September 2036. No patents have issued in this family to date.

In addition, the following three patent families are directed to therapeutic use/methods:

PCT/US2017/012606 (published as WO 2017/120523) broadly covers treatment methods for a number of muscle and neuromuscular disease and disorders with the use of an antibody that specifically blocks the activation step of myostatin. The related U.S. application was issued in May 2019 as U.S. Patent 10,287,345 and is projected to expire in January 2037. The issued claims are drawn to methods for inhibiting myostatin activation using our proprietary activation inhibitors (such as SRK-015) to cause specified pharmacological effects to treat a variety of conditions including, muscle and metabolic disorders.

PCT/US2017/037332 (published as WO 2017/218592) is directed to methods for treating neuromuscular diseases and selecting patient populations that are likely to respond to myostatin inhibition. This filing includes the treatment of SMA in patients who are on an SMN corrector therapy (e.g., SMN upregulators). This patent family is projected to expire in June 2037. The PCT application was nationalized in 11 jurisdictions. The European application has been recently found allowable with an Intention to Grant issued from the European Patent Office ("EPO"). The allowed claims broadly relate to add-on therapy and combination therapy for the treatment of SMA using a myostatin-selective inhibitor, such as activation inhibitors and neutralizing antibodies, in conjunction with an SMN corrector (e.g., SMN upregulators).

Finally, PCT/US2018/012686 (published as WO 2018/129395) relates to the treatment of metabolic diseases with the use of a myostatin activation inhibitor and is projected to expire in January 2038. The PCT was nationalized in 2019 and is in the early stage of prosecution.

In addition to the five pending patent families listed above, the issued claims of U.S. Patent 9,758,576 from the platform patents discussed in detail above cover monoclonal antibodies that selectively inhibit myostatin signaling by blocking the proteolytic activation of latent myostatin. These issued composition of matter claims provide protection for our first antibody SRK-015, as well as any other monoclonal antibodies that work by this unique mechanism of action. This patent expires in May 2034, not including any potential patent term extension.

TGFβ1 Activation Inhibitors

Ten patent families have been filed to date, covering various aspects of our TGFβ1 program. Patent prosecution of these families is in the early stages, and no patents have issued to date.

Isoform-specific inhibitors of TGFβ1 which confer improved safety profile and related methods are described in PCT/US2017/021972 (published as WO 2017/156500). This family is projected to expire in March 2037. Among TGFβ1 inhibitors, one of our context-independent antibodies is separately claimed and related preclinical data are described in PCT/US2018/012601 (published as WO 2018/129329). This patent application is projected to expire in January 2038. Improved isoform-selective, context-independent inhibitors of TGFβ1 are disclosed in PCT/US2019/041390 (published as WO 2020/014473). This family is projected to expire in 2039. One additional patent family has been filed and is in the priority year, which will be converted to international patent application (PCT) in January 2021. Antibodies disclosed in these families are subject to our Gilead Collaboration Agreement (Program 1).

In addition, high-affinity, isoform-selective TGFβ1 inhibitors are disclosed in PCT/2019/041373 (published as WO US2020/014460). Patents of this family are projected to expire in 2039. Separately, two direct national/regional applications covering related subject matter have been filed, in the U.S. and Europe, respectively. One additional patent family has been filed and is in the priority year, which will be converted to international patent applications (PCT) in January 2021. Antibodies claimed in these patent families are excluded from the Gilead Collaboration Agreement and include SRK-181.

LTBP complex-specific inhibitors of TGFβ1 are described in two patent families: PCT/US2018/44216 (published as WO 2019/023661) which is expected to expire in July of 2038; and a second family which has been converted to international applications in January 2020 (not yet published). The antibodies disclosed in these applications are subject to our Gilead Collaboration Agreement (Program 2).

PCT/US2017/042162 (published as WO 2018/013939) is a collaboration patent family exclusively licensed to Janssen. This patent family covers antibodies that specifically inhibit GARP-associated TGFβ, and is projected to expire in July 2037. Janssen takes prosecution lead in this case.

RGMc-Selective Inhibitors

One patent family has been filed to date, covering various aspects of our BMP6/RGMc program, and is still in the priority year. PCT application was filed in 2019 and is expected to publish in 2020.

Intellectual Property Protection

We cannot predict whether the patent applications we pursue will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide any proprietary protection from competitors. Even if our pending patent applications are granted as issued patents, those patents, as well as any patents we license from third parties, may be challenged, circumvented or invalidated by third parties. While there are currently no contested proceedings or third-party claims relating to any of the patents described above, we cannot provide any assurances that we will not have such proceedings or third-party claims at a later date.

The term of individual patents depends upon the legal term of the patents in 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 a non-provisional patent application. In the U.S., the patent term of a patent that covers an FDA-approved drug or biologic may also be eligible for patent term extension, which permits patent term restoration as compensation for the patent term lost during FDA regulatory review process. The Hatch-Waxman Amendments permit a patent term extension 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 or biologic is under regulatory review. Patent term 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 or biologic may be extended. Similar provisions are available in Europe and other foreign jurisdictions to extend the term of a patent that covers an approved drug or biologic or provide an additional period of protection for the approved pharmaceutical product following expiry of the patent. In the future, if our products receive FDA approval, we expect to apply for patent term extensions on patents covering those products. We plan 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 U.S. Patent and Trademark Office in the U.S. and the national patent offices in Europe, will agree with our assessment of whether such extensions should be granted, and if granted, the length of such extensions.

In addition to our reliance on patent protection for our inventions, product candidates and research programs, we also rely on trade secret protection for our confidential and proprietary information. For example, certain elements of our proprietary platform may be based on unpatented trade secrets that are not publicly disclosed. Although we take steps to protect our proprietary information and 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 or entity during the course of the party'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 addition, we take other appropriate precautions, such as physical and technological security measures, to guard against misappropriation of our proprietary technology by third parties. We have also adopted policies and conduct training that provides guidance on our expectations, and our advice for best practices, in protecting our trade secrets.

Manufacturing

We do not own or operate facilities for clinical drug manufacturing, storage, distribution or quality testing. Currently, all of our clinical manufacturing is outsourced to third-party manufacturers. As our development programs expand and we build new process efficiencies, we expect to continually evaluate this strategy with the objective of satisfying demand for registration trials and, if approved, the manufacture, sale and distribution of commercial products.

Antibody Discovery

As we continue to rely on third parties to conduct antibody discovery and optimization based on criteria and specifications provided by us, we are in the process of internalizing at least some of these processes. Certain antibody discovery and optimization vendors require us to enter into a license with them for the right to use antibodies discovered by them in humans or for commercial purposes. Such license could include substantial milestone payments and royalties to the extent we choose to use an antibody discovered by such vendor. On March 12, 2019, we exercised an option to receive such a license from Adimab pursuant to our Adimab Agreement. Please see the description above in "License Agreements – Adimab Agreement" for more details on the terms of this agreement.

Competition

The biotechnology and pharmaceutical industries are characterized by rapid evolution of technologies, fierce competition and strong defense of intellectual property. While we believe that our product candidates, discovery programs, technology, knowledge, experience and scientific resources provide us with competitive advantages, we face competition from major pharmaceutical and biotechnology companies, academic institutions, governmental agencies and public and private research institutions, among others.

Any product candidates that we successfully develop and commercialize will compete with currently approved therapies and new therapies that may become available in the future. Key product features that would affect our ability to effectively compete with other therapeutics include the efficacy, safety and convenience of our products.

At this time, there are no FDA- or EMA-approved muscle-directed treatments for SMA. We believe SRK-015 may be used in conjunction with SMN upregulators or as a monotherapy in certain settings. Biogen markets SPINRAZA® (nusinersen), the first marketed SMN2 upregulator. Biogen is also developing BIIB110 for SMA and other diseases. BIIB110 is a Phase 1 investigational agent that is intended to work in part through inhibition of the myostatin signaling pathway.

On May 24, 2019, Novartis International AG ("Novartis") received FDA approval for ZOLGENSMA® (onasemnogene abeparvovec-xioi), the first SMN1 gene replacement therapy in SMA. ZOLGENSMA® (onasemnogene abeparvovec-xioi) is currently available in the U.S. for SMA patients less than 2 years of age. Novartis is also developing an alternate formulation of onasemnogene abeparvovec-xioi for older SMA patients, as well as an oral SMN2 upregulator. Both of these additional investigational agents are in early stage clinical development.

A third SMN upregulator, The Roche Group's ("Roche's") risdiplam, may enter the U.S. market in the first half of 2020, with a FDA PDUFA date of May 24, 2020. Like SPINRAZA® (nusinersen), risdiplam modulates the SMN2 gene but is administered in an oral dosage form.

In collaboration with Astellas Pharma Inc., Cytokinetics, Inc. is developing reldesemtiv, a fast-skeletal muscle troponin activator ("FSTA"), as a potential treatment for amyotrophic lateral sclerosis ("ALS") and SMA.

Catalyst Pharmaceuticals Inc. and Roche are developing investigational agents with other mechanisms of action for the treatment of SMA.

Acceleron Pharma, Inc., Novartis, Regeneron Pharmaceuticals, Inc. and Roche are developing therapies for muscle-wasting diseases, other than SMA, that are intended to work, at least in part, through inhibition of the myostatin signaling pathway.

Our competitors for SRK-181 may include other companies developing cancer immunotherapies to be used in combination with CPI therapy. Merck KGaA's bintrafusp alfa, a bifunctional TGF-β trap/PD-L1 antibody that is partnered with GSK, is in pivotal trials for the treatment of biliary tract cancer. Several Phase II studies are also ongoing with bintrafusp alfa in non small cell lung cancer ("NSCLC"), as well as multiple Phase 1 studies in a variety of solid tumor types.

Other companies, including Sanofi S.A., Novartis, Forbius, and AbbVie Inc. are developing therapies for cancer immunotherapy in combination with CPI therapy, that are intended to work, at least in part, through inhibition of the TGFβ signaling pathway.

Our competitors may also include companies that are or will be developing therapies for the same therapeutic areas that we are targeting within our early pipeline, including other neuromuscular disorders, cancer, fibrosis and anemia.

Many of the companies against which we may compete have significantly greater financial resources and expertise than we do in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

The availability of reimbursement from government and other third-party payors will also significantly affect the pricing and competitiveness of our products. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

Government Regulation

Government authorities in the U.S. at the federal, state and local level and in other countries regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of drug and biological products, such as SRK-015, SRK-181 and any future product candidates. Generally, before a new drug or biologic can be marketed, considerable data demonstrating its quality, safety and efficacy must be obtained, organized into a format specific for each regulatory authority, submitted for review and approved by the regulatory authority.

U.S. Biological Product Development

In the U.S., the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act ("FDCA"), and its implementing regulations and biologics under the FDCA, the Public Health Service Act ("PHSA"), and their implementing regulations. Both drugs and biologics also are subject to other federal, state and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state and local statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or post-market may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, untitled or warning letters, product recalls or market withdrawals, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement and civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

SRK-015, SRK-181, and any future product candidates must be approved by the FDA through a Biologics License Application ("BLA"), process before they may be legally marketed in the U.S. The process generally involves the following:

- Completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice ("GLP") requirements;

- Submission to the FDA of an IND application, which must become effective before human clinical trials may begin;

- Approval by an institutional review board ("IRB") or independent ethics committee at each clinical trial site before each trial may be initiated;

- Performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations, good clinical practice ("GCP") requirements and other clinical trial-related regulations to establish the safety and efficacy of the investigational product for each proposed indication;

- Submission to the FDA of a BLA;

- A determination by the FDA within 60 days of its receipt of a BLA to accept the filing for review;

- Satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the biologic will be produced to assess compliance with cGMP requirements to assure that the facilities, methods and controls are adequate to preserve the biologic's identity, strength, quality and purity;

- Potential FDA audit of the clinical trial sites that generated the data in support of the BLA; and

- FDA review and approval of the BLA, including consideration of the views of any FDA advisory committee, prior to any commercial marketing or sale of the biologic in the U.S.

The preclinical and clinical testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for SRK-015, SRK-181 and any future product candidates will be granted on a timely basis, or at all.

Preclinical Studies and IND

Preclinical studies include laboratory evaluation of product chemistry and formulation, as well as *in vitro* and animal studies to assess the potential for adverse events and in some cases to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for safety/toxicology studies.

An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, to the FDA as part of an IND. An IND is a request for authorization from the FDA to administer an investigational product to humans, and must become effective before human clinical trials may begin. Some long-term preclinical testing may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time, the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical Trials

The clinical stage of development involves the administration of the investigational product to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCP requirements, which include the requirement that all patients provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Furthermore, each clinical trial must be reviewed and approved by an IRB for each institution at which the clinical trial will be conducted to ensure that the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the informed consent form that must be provided to each clinical trial subject or his or her legal representative,

and must monitor the clinical trial until completed. There also are requirements governing the reporting of ongoing clinical trials and completed clinical trial results to public registries.

A sponsor who wishes to conduct a clinical trial outside of the U.S. may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor may submit data from the clinical trial to the FDA in support of a BLA. The FDA will accept a well-designed and well-conducted foreign clinical study not conducted under an IND if the study was conducted in accordance with GCP requirements, and the FDA is able to validate the data through an onsite inspection if deemed necessary.

Clinical trials generally are conducted in three sequential phases, known as Phase 1, Phase 2 and Phase 3, and may overlap.

- Phase 1 clinical trials generally involve a small number of healthy volunteers or disease-affected patients who are initially exposed to a single dose and then multiple doses of the product candidate. The primary purpose of these clinical trials is to assess the metabolism, pharmacologic action, side effect tolerability and safety of the product candidate.

- Phase 2 clinical trials generally involve studies in disease-affected patients to evaluate proof of concept and/or determine the dosing regimen(s) for subsequent investigations. At the same time, safety and further PK and PD information is collected, possible adverse effects and safety risks are identified and a preliminary evaluation of efficacy is conducted.

- Phase 3 clinical trials generally involve a large number of patients at multiple sites and are designed to provide the data necessary to demonstrate the effectiveness of the product for its intended use, its safety in use and to establish the overall benefit/risk relationship of the product and provide an adequate basis for product labeling.

Post-approval trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of a BLA.

Progress reports detailing the results of the clinical trials, among other information, must be submitted at least annually to the FDA and written IND safety reports must be submitted to the FDA and the investigators for serious and unexpected suspected adverse events, findings from other studies or animal or *in vitro* testing that suggest a significant risk for human subjects and any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure.

Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug or biologic has been associated with unexpected serious harm to patients. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether a trial may move forward at designated check points based on access to certain data from the trial. Concurrent with clinical trials, companies usually complete additional animal studies and also must develop additional information about the chemistry and physical characteristics of the drug or biologic as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product and, among other things, companies must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidates do not undergo unacceptable deterioration over their shelf life.

FDA Review Process

Following completion of the clinical trials, data are analyzed to assess whether the investigational product is safe and effective for the proposed indicated use or uses. The results of preclinical studies and clinical trials are then submitted to the FDA as part of a BLA, along with proposed labeling, chemistry and manufacturing information to ensure product quality and other relevant data. The BLA is a request for approval to market the biologic for one or more specified indications and must contain proof of safety and efficacy for a drug or safety, purity and potency for a biologic. The application may include both negative and ambiguous results of preclinical studies and clinical trials, as well as positive findings. Data may come from company-sponsored clinical trials intended to test the safety and efficacy of a product's use or from a number of alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the investigational product to the satisfaction of the FDA. FDA approval of a BLA must be obtained before a biologic may be marketed in the U.S.

Under the Prescription Drug User Fee Act ("PDUFA") as amended, each BLA must be accompanied by a user fee. The FDA adjusts the PDUFA user fees on an annual basis. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA reviews all submitted BLAs before it accepts them for filing, and may request additional information rather than accepting the BLA for filing. The FDA must make a decision on accepting a BLA for filing within 60 days of receipt, and such decision could include a refusal to file ("RTF") by the FDA. Once the submission is accepted for filing, the FDA begins an in-depth review of the BLA. Under the goals and policies agreed to by the FDA under PDUFA, the FDA has 10 months, from the filing date, in which to complete its initial review of an original BLA and respond to the applicant, and six months from the filing date of an original BLA designated for priority review. The FDA does not always meet its PDUFA goal dates for standard and priority BLAs, and the review process is often extended by FDA requests for additional information or clarification.

Before approving a BLA, the FDA will conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with cGMP requirements. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. The FDA also may audit data from clinical trials to ensure compliance with GCP requirements. Additionally, the FDA may refer applications for novel products or products which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions, if any. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions on approval. The FDA likely will reanalyze the clinical trial data, which could result in extensive discussions between the FDA and the applicant during the review process. After the FDA evaluates a BLA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the biologic with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes all of the specific deficiencies in the BLA identified by the FDA. The Complete Response Letter may require additional clinical data, additional pivotal Phase 3 clinical trial(s) and/or other significant and time-consuming requirements related to clinical trials, preclinical studies or manufacturing. If a Complete Response Letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the BLA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biological product intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the U.S., or more than 200,000 individuals in the U.S. and for which there is no reasonable expectation that the cost of

developing and making the product available in the U.S. for this type of disease or condition will be recovered from sales of the product. On March 22, 2018, the FDA granted Orphan Drug Designation for SRK-015 for the treatment of SMA.

Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same drug for the same indication for seven years from the date of such approval, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity by means of greater effectiveness, greater safety or providing a major contribution to patient care or in instances of drug supply issues. Competitors, however, may receive approval of either a different product for the same indication or the same product for a different indication but that could be used off-label in the orphan indication. Orphan drug exclusivity also could block the approval of one of our products for seven years if a competitor obtains approval before we do for the same product, as defined by the FDA, for the same indication we are seeking approval, or if our product is determined to be contained within the scope of the competitor's product for the same indication or disease. If one of our products designated as an orphan drug receives marketing approval for an indication broader than that which is designated, it may not be entitled to orphan drug exclusivity. Orphan drug status in the European Union ("EU") has similar, but not identical, requirements and benefits.

Expedited Development and Review Programs

The FDA has a fast track program that is intended to expedite or facilitate the process for reviewing new drugs and biologics that meet certain criteria. Specifically, new drugs and biologics are eligible for fast track designation if they are intended to treat a serious or life-threatening condition and preclinical or clinical data demonstrate the potential to address unmet medical needs for the condition. Fast track designation applies to both the product and the specific indication for which it is being studied. The sponsor can request the FDA to designate the product for fast track status any time before receiving BLA approval, but ideally no later than the pre-BLA meeting. Any product submitted to the FDA for marketing, including under a fast track program, may be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. Any product is eligible for priority review if it treats a serious or life-threatening condition and, if approved, would provide a significant improvement in safety and effectiveness compared to available therapies. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug or biologic designated for priority review in an effort to facilitate the review.

A product may also be eligible for accelerated approval, if it treats a serious or life-threatening condition and generally provides a meaningful advantage over available therapies. In addition, it must demonstrate an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality ("IMM"), that is reasonably likely to predict an effect on IMM or other clinical benefit. As a condition of approval, the FDA may require that a sponsor of a drug or biologic receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials. If the FDA concludes that a drug or biologic shown to be effective can be safely used only if distribution or use is restricted, it will require such post-marketing restrictions, as it deems necessary to assure safe use of the product. If the FDA determines that the conditions of approval are not being met, the FDA can withdraw its accelerated approval for such drug or biologic.

Additionally, a drug or biologic may be eligible for designation as a breakthrough therapy if the product is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over currently approved therapies on one or more clinically significant endpoints. The benefits of breakthrough therapy designation include the same benefits as fast track designation, plus intensive guidance from the FDA to ensure an efficient drug development program.

Fast track designation, priority review, accelerated approval and breakthrough therapy designation do not change the standards for approval, but may expedite the development or approval process.

Pediatric Information

Under the Pediatric Research Equity Act ("PREA"), as amended, a BLA or supplement to a BLA must contain data to assess the safety and efficacy of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may grant deferrals for submission of pediatric data or full or partial waivers. A sponsor who is planning to submit a marketing application for a drug that includes a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration submit an initial Pediatric Study Plan ("PSP") within 60 days of an end-of-Phase 2 meeting or, if there is no such meeting, as early as practicable before the initiation of the Phase 3 or Phase 2/3 study. The initial PSP must include an outline of the pediatric study or studies that the sponsor plans to conduct, including study objectives and design, age groups, relevant endpoints and statistical approach, or a justification for not including such detailed information, and any request for a deferral of pediatric assessments or a full or partial waiver of the requirement to provide data from pediatric studies along with supporting information. The FDA and the sponsor must reach an agreement on the PSP. A sponsor can submit amendments to an agreed-upon initial PSP at any time if changes to the pediatric plan need to be considered based on data collected from preclinical studies, early phase clinical trials and/or other clinical development programs.

Post-marketing Requirements

Following approval of a new product, the manufacturer and the approved product are subject to continuing regulation by the FDA, including, among other things, monitoring and record-keeping activities, reporting of adverse experiences, complying with promotion and advertising requirements, which include restrictions on promoting products for unapproved uses or patient populations (known as "off-label use") and limitations on industry-sponsored scientific and educational activities. Although physicians may prescribe legally available products for off-label uses, manufacturers may not market or promote such uses. Prescription drug and biologic promotional materials must be submitted to the FDA in conjunction with their first use. Further, if there are any modifications to the drug or biologic, including changes in indications, labeling or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new BLA or BLA supplement, which may require the development of additional data or preclinical studies and clinical trials.

The FDA may also place other conditions on approvals including the requirement for a Risk Evaluation and Mitigation Strategy ("REMS") to assure the safe use of the product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS. The FDA will not approve the BLA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Newly discovered or developed safety or effectiveness data may require changes to a drug's approved labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures, including a REMS or the conduct of post-marketing studies to assess a newly discovered safety issue. Product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following initial marketing.

FDA regulations require that products be manufactured in specific approved facilities and in accordance with cGMP regulations. We rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of our products in accordance with cGMP regulations. These manufacturers must comply with cGMP regulations that require, among other things, quality control and quality assurance, the maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved drugs or biologics are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP requirements and other laws. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance. The discovery of violative conditions, including failure to conform to cGMP regulations, could result in enforcement actions, and the discovery of problems with a product after approval may result in restrictions on a product, manufacturer or holder of an approved BLA, including recall.

Other Regulatory Matters

Manufacturing, sales, promotion and other activities following product approval are also subject to regulation by numerous regulatory authorities in the U.S. in addition to the FDA, including the Centers for Medicare & Medicaid Services ("CMS"), other divisions of the Department of Health and Human Services ("HHS"), the Department of Justice, the Consumer Product Safety Commission, the Federal Trade Commission, the Occupational Safety & Health Administration, the Environmental Protection Agency and state and local governments.

Other Healthcare Laws

Healthcare providers, physicians, and third-party payors will play a primary role in the recommendation and prescription of any products for which we obtain marketing approval. Our future arrangements with third-party payors, healthcare providers and physicians may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute any drugs for which we obtain marketing approval. In particular, the research of our product candidates, as well as the promotion, sales and marketing of healthcare items and services, as well as certain business arrangements in the healthcare industry, are subject to extensive laws designed to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, structuring and commission(s), certain customer incentive programs and other business arrangements generally. Activities subject to these laws also involve the improper use of information obtained in the course of patient recruitment for clinical trials. In the U.S., these laws include, without limitation, state and federal anti-kickback, false claims, physician transparency, and patient data privacy and security laws and regulations, including but not limited to those described below.

- The Anti-Kickback Statute, which makes it illegal for among other things, any person or entity, including a prescription drug manufacturer (or a party acting on its behalf), to knowingly and willfully solicit, receive, offer or pay any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, that is intended to induce or reward referrals, including the purchase, recommendation, order or prescription of a particular drug, for which payment may be made under a federal healthcare program, such as Medicare or Medicaid. Violations of this law are punishable by individual imprisonment, criminal fines, administrative civil money penalties and exclusion from participation in federal healthcare programs. In addition, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it to have committed a violation.

- The federal civil and criminal false claims laws, including the False Claims Act ("FCA"), which prohibits individuals or entities (including prescription drug manufacturers) from knowingly presenting, or causing to be presented false or fraudulent claims for payment by a federal healthcare program or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government. The government may deem manufacturers to have "caused" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off label. Claims which include items or services resulting from a violation of the Anti-Kickback Statute are false or fraudulent claims for purposes of the FCA. Our future marketing and activities relating to the reporting of wholesaler or estimated retail prices for our products, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party reimbursement for our products, and the sale and marketing of our product and any future product candidates, are subject to scrutiny under this these laws.

- The Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), which created additional federal criminal statutes that prohibit among other things, knowingly and willfully executing a scheme, or attempting to execute a scheme, to defraud any healthcare benefit program, including private payors, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statements 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 the Health Information Technology for Economic and Clinical Health Act of 2009 ("HITECH"), and their respective implementing regulations, which impose, among other things, specified requirements on covered entities, which include certain healthcare providers, health plans and healthcare clearinghouses, and their business associates, which include individuals or entities that perform services for covered entities involving the creation, use, maintenance or disclosure of, individually identifiable health information, relating to the privacy and security of individually identifiable health information including mandatory contractual terms and required implementation of technical safeguards of such information. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions.

- The Physician Payments Sunshine Act, enacted as part of the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010 (collectively, the "ACA"), which impose new annual reporting requirements for certain manufacturers of drugs, devices, biologics, and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program, for certain payments and "transfers of value" provided to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members. Effective January 1, 2022, these reporting obligations will extend to include transfers of value made to certain non-physician providers such as physician assistants and nurse practitioners.

- Analogous state and foreign fraud and abuse laws and regulations, such as state anti-kickback and false claims laws, which may be broader in scope and apply regardless of payor. Such laws are enforced by various state agencies and through private actions. Some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant federal government compliance guidance, require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers, and restrict marketing practices or require disclosure of marketing expenditures. Some state and local laws require the registration of pharmaceutical sales representatives.

- State and foreign laws also govern the privacy and security of health information in some circumstances. Such data privacy and security laws may differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts. For example, in California the California Consumer Protection Act ("CCPA"), which went into effect on January 1, 2020, establishes a new privacy framework for covered businesses by creating an expanded definition of personal information, establishing new data privacy rights for consumers in the State of California, imposing special rules on the collection of consumer data from minors, and creating a new and potentially severe statutory damages framework for violations of the CCPA and for businesses that fail to implement reasonable security procedures and practices to prevent data breaches. While clinical trial data and information governed by HIPAA are currently exempt from the current version of the CCPA, other personal information may be applicable and possible changes to the CCPA may broaden its scope. The European Union General Data Protection Regulation ("GDPR"), also governs the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. It is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other related governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, individual

imprisonment, disgorgement, exclusion of drugs from participation in state and federal healthcare programs, such as Medicare and Medicaid, reputational harm, additional oversight and reporting obligations if we become subject to a corporate integrity agreement or similar settlement to resolve allegations of non-compliance with these laws and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to similar actions, penalties and sanctions. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time and resource consuming and can divert a company's attention from the business.

Current and Future Healthcare Reform Legislation

In the U.S. and foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval. We expect that current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we, or any collaborators, may receive for any approved products.

The ACA, for example, contains provisions that subject biological products to potential competition by lower cost biosimilars and may reduce the profitability of drug products through increased rebates for drugs reimbursed by Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. The Trump Administration and Congress have taken steps to make administrative or legislative changes, including modification, repeal, or replacement of all, or certain provisions of, the ACA, which may impact reimbursement for drugs and biologics. On January 20, 2017, President Trump signed an Executive Order directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. On October 13, 2017, President Trump signed an Executive Order terminating the cost sharing subsidies that reimburse insurers under the ACA. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. On June 14, 2018, the U.S. Court of Appeals for the Federal Circuit ruled that the federal government was not required to pay more than $12 billion in ACA risk corridor payments to third-party payors who argued the payments were owed to them. This was appealed to the U.S. Supreme Court, which heard arguments on December 10, 2019. We cannot predict how the U.S. Supreme Court will rule. In addition, the CMS finalized regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the ACA for plans sold through such marketplaces.

Further, each chamber of Congress has put forth multiple bills designed to repeal or repeal and replace portions of the ACA. While Congress has not passed repeal legislation, several bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Reform Act includes a provision, effective January 1, 2019, decreasing 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," to $0. On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas ruled that the individual mandate is a critical and inseverable feature of the ACA, and therefore, because it was repealed as part of the Tax Cuts and Jobs Act ("Tax Act"), the remaining provisions of the ACA are invalid as well. On December 18, 2019, the Fifth Circuit U.S. Court of Appeals held that the individual mandate is unconstitutional and remanded the case to the lower court to reconsider its earlier invalidation of the full ACA. Pending review, the ACA remains in effect, but it is unclear at this time what effect the latest ruling will have on the status of the ACA. Further, the Bipartisan Budget Act of 2019 ("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." In December 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. Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the "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; however, on December 20, 2019, President Trump signed into law the Further Consolidated Appropriations Act (H.R. 1865), which repeals the Cadillac tax, the health insurance provider tax, and the medical device excise tax.

Congress may consider additional legislation to repeal or repeal and replace other elements of the ACA. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

Additionally, other federal health reform measures have been proposed and adopted in the U.S. since the ACA was enacted:

- The Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and, due to subsequent legislative amendments, including the BBA, will remain in effect through 2029 unless additional Congressional action is taken.

- The American Taxpayer Relief Act of 2012, among other things, reduced Medicare payments to several providers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

- The Middle Class Tax Relief and Job Creation Act of 2012 required that the CMS, reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which served as a base for 2014 and subsequent years. In addition, effective January 1, 2014, CMS also began bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting.

- On May 30, 2018, the Right to Try Act, 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 permission under the FDA expanded access program. There is no obligation for a drug manufacturer to make its drug products available to eligible patients as a result of the Right to Try Act, but the manufacturer must develop an internal policy and respond to patient requests according to that policy. We expect that additional foreign, federal and state 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 limited coverage and reimbursement and reduced demand for our products, once approved, or additional pricing pressures.

Further, there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which have resulted in several recent Congressional inquiries and proposed bills 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 products. At the federal level, the Trump administration released a "Blueprint" that contains additional proposals to increase drug manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products, and reduce the out of pocket costs of drug products paid by consumers. HHS has already started the process of soliciting feedback on some of these measures and, at the same time, is immediately implementing others under its existing authority. For example, in May 2019, CMS issued a final rule to allow Medicare Advantage Plans the option of using step therapy, a type of prior authorization, for Part B drugs beginning January 1, 2020. This final rule codified CMS's policy change that was effective January 1, 2019. In addition, the U.S. government, state legislatures, and foreign governments have shown significant interest in

implementing cost containment programs, including price controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs to limit the growth of government paid health care costs. For example, the U.S. government has passed legislation requiring pharmaceutical manufacturers to provide rebates and discounts to certain entities and governmental payors to participate in federal healthcare programs. Additionally, the Trump Administration's budget proposal for fiscal year 2019 and 2020 contains further drug price control measures that could be enacted during the 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. On September 25, 2019, the Senate Finance Committee introduced the Prescription Drug Pricing Reduction Action of 2019, a bill intended to reduce Medicare and Medicaid prescription drug prices. The proposed legislation would restructure the Part D benefit, modify payment methodologies for certain drugs, and impose an inflation cap on drug price increases. An even more restrictive bill, the Lower Drug Costs Now Act of 2019, was introduced in the House of Representatives on September 19, 2019, and would require the HHS to directly negotiate drug prices with manufacturers. The Lower Drugs Costs Now Act of 2019 has passed out of the House and was delivered to the Senate on December 16, 2019. However, it is unclear whether either of these bills will make it through both chambers and be signed into law, and if either is enacted, what effect it would have on our business. While any proposed measures will require authorization through additional legislation to become effective, Congress and the Trump Administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. Individual states in the U.S. have also become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

Packaging and Distribution in the U.S.

If our products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Products must meet applicable child resistant packaging requirements under the U.S. Poison Prevention Packaging Act. Manufacturing, sales, promotion and other activities also are potentially subject to federal and state consumer protection and unfair competition laws.

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

The failure to comply with any of these laws or regulatory requirements subjects firms to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in criminal prosecution, fines or other penalties, injunctions, exclusion from federal healthcare programs, requests for recall, seizure of products, total or partial suspension of production, denial or withdrawal of product approvals, or refusal to allow a firm to enter into supply contracts, including government contracts. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. Prohibitions or restrictions on sales or withdrawal of future products marketed by us could materially affect our business in an adverse way.

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

Other U.S. Environmental, Health and Safety Laws and Regulations

We may be subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. From time to time and in the future, our operations may involve the use of hazardous and flammable materials, including chemicals and biological materials, and may also produce hazardous waste products. Even if we contract with third

parties for the disposal of these materials and waste products, we cannot completely eliminate the risk of contamination or injury resulting from these materials. In the event of contamination or injury resulting from the use or disposal of our hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

We maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees, but this insurance may not provide adequate coverage against potential liabilities. However, we do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Current or future environmental laws and regulations may impair our research, development or production efforts. In addition, failure to comply with these laws and regulations may result in substantial fines, penalties or other sanctions.

U.S. Patent Term Restoration and Marketing Exclusivity

Depending upon the timing, duration and specifics of FDA approval of SRK-015, SRK-181 and any future product candidates, some of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the Hatch Waxman Amendments. The Hatch Waxman Amendments permit restoration of the patent term of up to five years as compensation for patent term lost during product development and FDA regulatory review process. Patent term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent term restoration period is generally one half the time between the effective date of an IND and the submission date of a BLA plus the time between the submission date of a BLA and the approval of that application, except that the review period is reduced by any time during which the applicant failed to exercise due diligence. Only one patent applicable to an approved drug is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The U.S. PTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may apply for restoration of patent term for our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant BLA.

An abbreviated approval pathway for biological products shown to be biosimilar to, or interchangeable with, an FDA licensed reference biological product was created by the Biologics Price Competition and Innovation Act of 2009 ("BPCI Act"). This amendment to the PHSA, in part, attempts to minimize duplicative testing. Biosimilarity, which requires that the biological product be highly similar to the reference product notwithstanding minor differences in clinically inactive components and that there be no clinically meaningful differences between the product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical trial or trials. Interchangeability requires that a biological product be biosimilar to the reference product and that the product can be expected to produce the same clinical results as the reference product in any given patient and, for products administered multiple times to an individual, that the product and the reference product may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biological product without such alternation or switch.

A reference biological product is granted 12 years of data exclusivity from the time of first licensure of the product, and the FDA will not accept an application for a biosimilar or interchangeable product based on the reference biological product until four years after the date of first licensure of the reference product. "First licensure" typically means the initial date the particular product at issue was licensed in the U.S. Date of first licensure does not include the date of licensure of (and a new period of exclusivity is not available for) a biological product if the licensure is for a supplement for the biological product or for a subsequent application by the same sponsor or manufacturer of the biological product (or licensor, predecessor in interest, or other related entity) for a change (not including a modification to the structure of the biological product) that results in a new indication, route of administration, dosing schedule, dosage form, delivery system, delivery device or strength, or for a modification to the structure of the biological product that does not result in a change in safety, purity, or potency.

Pediatric exclusivity is another type of regulatory market exclusivity in the U.S. Pediatric exclusivity, if granted, adds six months to existing regulatory exclusivity periods. This six-month exclusivity may be granted based on the voluntary completion of a pediatric trial in accordance with an FDA issued "Written Request" for such a trial.

European Union Drug Development

In the EU, our future products also may be subject to extensive regulatory requirements. As in the U.S., medicinal products can be marketed only if a marketing authorization from the competent regulatory agencies has been obtained.

Similar to the U.S., the various phases of preclinical and clinical research in the EU are subject to significant regulatory controls. Although the EU Clinical Trials Directive 2001/20/EC has sought to harmonize the EU clinical trials regulatory framework, setting out common rules for the control and authorization of clinical trials in the EU, the EU Member States have transposed and applied the provisions of the Directive differently. This has led to significant variations in the member state regimes. Under the current regime, before a clinical trial can be initiated it must be approved in each of the EU countries where the trial is to be conducted by two distinct bodies: the National Competent Authority ("NCA"), and one or more Ethics Committees ("ECs"). Under the current regime all suspected unexpected serious adverse reactions to the investigated drug that occur during the clinical trial have to be reported to the NCA and ECs of the Member State where they occurred.

The EU clinical trials legislation currently is undergoing a transition process mainly aimed at harmonizing and streamlining clinical trial authorization, simplifying adverse event reporting procedures, improving the supervision of clinical trials and increasing their transparency. Recently enacted Clinical Trials Regulation EU No 536/2014 ensures that the rules for conducting clinical trials in the EU will be identical.

European Union Drug Marketing

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

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

European Union Drug Review and Approval

In the European Economic Area ("EEA"), which is comprised of the 28 Member States of the EU and Norway, Iceland and Liechtenstein, medicinal products can only be commercialized after obtaining a Marketing Authorization ("MA"). There are two types of marketing authorizations.

The Community MA is issued by the EC through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use ("CHMP"), of the EMA, and is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as biotechnology medicinal products, orphan medicinal products, advanced therapy medicines such as gene therapy, somatic cell therapy or tissue engineered medicines and medicinal products containing a new active substance indicated for the treatment of HIV, AIDS, cancer, neurodegenerative disorders, diabetes, autoimmune and other immune dysfunctions and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU.

National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member States through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure. Under the Decentralized Procedure an identical dossier is submitted to the competent authorities of each of the Member States in which the MA is sought, one of which is selected by the applicant as the Reference Member State ("RMS"). The competent authority of the RMS prepares a draft assessment report, a draft summary of the product characteristics ("SPC"), and a draft of the labeling and package leaflet, which are sent to the other Member States (referred to as the Member States Concerned) for their approval. If the Member States Concerned raise no objections, based on a potential serious risk to public health, to the assessment, SPC, labeling, or packaging proposed by the RMS, the product is subsequently granted a national MA in all the Member States (i.e., in the RMS and the Member States Concerned).

Under the above described procedures, before granting the MA, the EMA or the competent authorities of the Member States of the EEA make an assessment of the risk benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

European Union Exclusivity

In the EU, new products authorized for marketing (i.e., reference products) qualify for eight years of data exclusivity and an additional two years of market exclusivity upon marketing authorization. The data exclusivity, if granted, prevents regulatory authorities in the EU from referencing the innovator's data to assess a generic application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. The overall 10-year period will be extended to a maximum of 11 years if, during the first eight years of those 10 years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are determined to bring a significant clinical benefit in comparison with currently approved therapies.

European Union Orphan Designation and Exclusivity

In the EU, the EMA's Committee for Orphan Medicinal Products ("COMP"), grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of life-threatening or chronically debilitating conditions affecting not more than five in 10,000 persons in the EU community (or where it is unlikely that the development of the medicine would generate sufficient return to justify the investment) and for which no satisfactory method of diagnosis, prevention or treatment has been authorized (or, if a method exists, the product would be a significant benefit to those affected). In December 2018, the EC granted Orphan Medicinal Product Designation to SRK-015 for the treatment of SMA.

In the EU, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers and 10 years of market exclusivity is granted following medicinal product approval. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity. Orphan drug designation must be requested before submitting an application for marketing approval. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

European Data Collection and State Privacy Laws

Since we conduct clinical trials in the EEA, we are subject to additional European data privacy laws. The General Data Protection Regulation, (EU) 2016/679 ("GDPR"), became effective on May 25, 2018, and deals with the processing of personal data and on the free movement of such data. The GDPR imposes a broad range of strict requirements on companies subject to the GDPR, including requirements relating to having legal bases for processing personal data (such as health and other sensitive data,) relating to identifiable individuals and transferring such information outside the EEA, including to the U.S., providing details to those individuals regarding the processing of their personal information, keeping personal information secure, obtaining consent of the individuals to whom the personal data relates, having data processing agreements with third parties who process personal information, responding to individuals' requests to exercise their rights in respect of their personal information, reporting security breaches involving personal data to the

competent national data protection authority and affected individuals, appointing data protection officers, conducting data protection impact assessments, and record-keeping. The GDPR increases substantially the penalties to which we could be subject in the event of any non-compliance, including fines of up to 10,000,000 Euros or up to 2% of our total worldwide annual turnover for certain comparatively minor offenses, or up to 20,000,000 Euros or up to 4% of our total worldwide annual turnover for more serious offenses, whichever is greater. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. In addition, the GDPR includes restrictions on cross-border data transfers. The GDPR may increase our responsibility and liability in relation to personal data that we process where such processing is subject to the GDPR, and we may be required to put in place additional mechanisms to ensure compliance with the GDPR, including as implemented by individual countries. Given the limited enforcement of the GDPR to date, we face uncertainty as to the exact interpretation of the new requirements on our trials and we may be unsuccessful in implementing all measures required by data protection authorities or courts in interpretation of the new law. Compliance with the GDPR will be a rigorous and time-intensive process that may increase our cost of doing business or require us to change our business practices, and despite those efforts, there is a risk that we may be subject to fines and penalties, litigation, and reputational harm in connection with our European activities.

National laws of member states of the EU are in the process of being adapted to the requirements under the GDPR, thereby implementing national laws which may partially deviate from the GDPR and impose different obligations from country to country, so that we do not expect to operate in a uniform legal landscape in the EEA. Also, as it relates to processing and transfer of genetic data, the GDPR specifically allows national laws to impose additional and more specific requirements or restrictions, and European laws have historically differed quite substantially in this field, leading to additional uncertainty. Further, the impact of the impending “Brexit”, (whereby the United Kingdom is planning to leave the EEA in March of 2019), either with or without a "deal" is uncertain and cannot be predicted at this time.

In the event we continue to conduct clinical trials in the EEA, we must also ensure that we maintain adequate safeguards to enable the transfer of personal data outside of the EEA, in particular to the U.S., in compliance with European data protection laws. We expect that we will continue to face uncertainty as to whether our efforts to comply with our obligations under European privacy laws will be sufficient. If we are investigated by a European data protection authority, we may face fines and other penalties. Any such investigation or charges by European data protection authorities could have a negative effect on our existing business and on our ability to attract and retain new clients or pharmaceutical partners. We may also experience hesitancy, reluctance, or refusal by European or multi-national clients or pharmaceutical partners to continue to use our products and solutions due to the potential risk exposure as a result of the current (and, in particular, future) data protection obligations imposed on them by certain data protection authorities in interpretation of current law, including the GDPR. Such clients or pharmaceutical partners may also view any alternative approaches to compliance as being too costly, too burdensome, too legally uncertain, or otherwise objectionable and therefore decide not to do business with us. Any of the foregoing could materially harm our business, prospects, financial condition and results of operations.

In addition, California recently enacted the CCPA, which creates new individual privacy rights for California consumers (as defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. The CCPA will require covered companies to provide certain disclosures to consumers about its data collection, use and sharing practices, and to provide affected California residents with ways to opt-out of certain sales or transfers of personal information. The CCPA went into effect on January 1, 2020, and the California Attorney General will commence enforcement actions against violators beginning July 1, 2020. While there is currently an exception for protected health information that is subject to HIPAA, as currently written, the CCPA may impact our business activities. The California Attorney General has proposed draft regulations, which have not been finalized to date, that may further impact our business activities if they are adopted. The uncertainty surrounding the implementation of CCPA exemplifies the vulnerability of our business to the evolving regulatory environment related to personal data and protected health information.

Rest of the World Regulation

For other countries outside of the EU and the U.S., such as countries in Eastern Europe, Latin America or Asia, the requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. Additionally, the clinical trials must be conducted in accordance with GCP requirements and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Additional Laws and Regulations Governing International Operations

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

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

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

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

Reimbursement

Sales of our products will depend, in part, on the extent to which our products, if approved, will be covered by third-party payors, such as government health programs, commercial insurers and managed healthcare organizations, as well as the level of reimbursement such third-party payors provide for our products. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid, and commercial payors is critical to new product acceptance. The availability of coverage and extent of reimbursement by governmental and private payors is essential for most patients to be able to afford treatments. Patients and providers are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products. Even if coverage is provided, the approved reimbursement amount may not be high enough to allow us to establish or maintain pricing sufficient to realize a return on our investment. In the U.S. no uniform policy of coverage and reimbursement for drugs or biological products exists, and one payor's determination to provide coverage and adequate reimbursement for a product does not assure that other payors will make a similar determination. Accordingly, decisions regarding the extent of coverage and amount of reimbursement to be provided for any of our products candidates, if approved, will be made on a payor by payor basis. As a result, the coverage determination process may be a time consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained.

The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the Secretary of the HHS as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. The ACA made several changes to the Medicaid Drug

Rebate Program, including increasing pharmaceutical manufacturers' rebate liability by raising the minimum basic Medicaid rebate on most branded prescription drugs from 15.1% of average manufacturer price ("AMP") to 23.1% of AMP and adding a new rebate calculation for "line extensions" (i.e., new formulations, such as extended release formulations) of solid oral dosage forms of branded products, creating a new method by which rebates owed by are calculated for drugs that are inhaled, infused, instilled, implanted or injected, as well as potentially impacting their rebate liability by modifying the statutory definition of AMP. The ACA also expanded the universe of Medicaid utilization subject to drug rebates by requiring pharmaceutical manufacturers to pay rebates on Medicaid managed care utilization and by enlarging the population potentially eligible for Medicaid drug benefits. Pricing and rebate programs must also comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990.

The Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (the "MMA") established the Medicare Part D program to provide a voluntary prescription drug benefit to Medicare beneficiaries. Under Part D, Medicare beneficiaries may enroll in prescription drug plans offered by private entities that provide coverage of outpatient prescription drugs. Unlike Medicare Part A and B, Part D coverage is not standardized. While all Medicare drug plans must give at least a standard level of coverage set by Medicare, Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level. However, Part D prescription drug formularies must include drugs within each therapeutic category and class of covered Part D drugs, though not necessarily all the drugs in each category or class. Any formulary used by a Part D prescription drug plan must be developed and reviewed by a pharmacy and therapeutic committee. Government payment for some of the costs of prescription drugs may increase demand for products for which we receive marketing approval. However, any negotiated prices for our products covered by a Part D prescription drug plan likely will be lower than the prices we might otherwise obtain. Moreover, while the MMA applies only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own payment rates. Any reduction in payment that results from the MMA may result in a similar reduction in payments from non-governmental payors.

For a drug product to receive federal reimbursement under the Medicaid or Medicare Part B programs or to be sold directly to U.S. government agencies, the manufacturer must extend discounts to entities eligible to participate in the 340B drug pricing program. The required 340B discount on a given product is calculated based on the AMP and Medicaid rebate amounts reported by the manufacturer. As of 2010, the ACA expanded the types of entities eligible to receive discounted 340B pricing, although, under the current state of the law, with the exception of children's hospitals, these newly eligible entities will not be eligible to receive discounted 340B pricing on orphan drugs. In addition, as 340B drug pricing is determined based on AMP and Medicaid rebate data, the revisions to the Medicaid rebate formula and AMP definition described above could cause the required 340B discount to increase.

As noted above, the marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide coverage and adequate reimbursement. An increasing emphasis on cost containment measures in the U.S. has increased and we expect will continue to increase the pressure on pharmaceutical pricing. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

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

In addition, in most foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. For example, the EU provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. Reference pricing used by various EU Member States and parallel distribution, or arbitrage between low priced and high priced member states, can further reduce prices. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal

product on the market. In some countries, we may be required to conduct a clinical study or other studies that compare the cost effectiveness of any of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the EU do not follow price structures of the U.S. and generally prices tend to be significantly lower. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries.

Employees

As of March 1, 2020, we had 93 full-time employees, of which 70 employees are engaged in research and development activities and 23 are engaged in general and administrative activities. None of our employees is represented by a labor union or covered by a collective bargaining agreement.

Facilities

Our corporate headquarters and operations are located in Cambridge, Massachusetts. In March 2015, we entered into a lease of laboratory and office space at 620 Memorial Drive in Cambridge, Massachusetts. Our amended lease expires in September 2023 and we have an option to extend the lease term for five additional years.

In November 2019, we entered into a lease of laboratory and office space at 301 Binney Street in Cambridge, Massachusetts to be used as our new corporate headquarters. We are currently involved in the construction and design of the space. The expiration date is in August 2025 and we have the option to extend the term by two years.

We believe that our existing facilities are adequate to meet our current needs, and that suitable additional space will be available as and when needed.

Legal Proceedings

From time to time, we may be involved in various claims and legal proceedings relating to claims arising out of our operations. We are not currently a party to any material legal proceedings.

Website Access to Reports

We are subject to the informational requirements of the Exchange Act and are required to file annual, quarterly and current reports, proxy statements and other information with the SEC. You can read our SEC filings, including the registration statement, at the SEC's website at www.sec.gov. We also maintain a website at http://www.scholarrock.com. You may access, free of charge, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and any amendments to those reports, as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. The information that is posted on or is accessible through our website is not incorporated by reference into this Annual Report on Form 10-K and should not be considered part of this or any other report that we file with or furnish to the SEC.

Item 1A. Risk Factors

Careful consideration should be given to the following risk factors, together with all other information set forth in this Annual Report on Form 10-K, including our consolidated financial statements and related notes, and "Management's Discussion and Analysis of Financial Condition and Results of Operations," and in other documents that we file with the SEC, in evaluating Scholar Rock Holding Corporation and our subsidiaries (collectively, the "Company") and our business, before investing in our common stock. Investing in our common stock involves a high degree of risk. If any of the following risks and uncertainties actually occurs, our business, prospects, financial condition and results of operations could be materially and adversely affected. The market price of our common stock could decline if one or more of these risks or uncertainties were to occur, which may cause you to lose all or part of the money you paid to buy

our common stock. The risks described below are not intended to be exhaustive and are not the only risks facing the Company. New risk factors can emerge from time to time, and it is not possible to predict the impact that any factor or combination of factors may have on our business, prospects, financial condition and results of operations. Certain statements below are forward-looking statements. See "Special Note Regarding Forward-Looking Statements" in this report.

Risks Related to Our Business and Operations

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

We are a biopharmaceutical company formed in 2012 and our operations to date have been focused on research and development of monoclonal antibodies that selectively inhibit activation of growth factors for therapeutic effect. We have not yet demonstrated the ability to progress any of our product candidates through clinical trials, we have no products approved for commercial sale and we have not generated any revenue from product sales to date. We continue to incur significant research and development and other expenses related to our ongoing operations. As a result, we are not profitable and have incurred losses in each period since our inception. For the years ended December 31, 2019 and 2018, we reported a net loss of $51.0 million and $49.3 million, respectively. As of December 31, 2019, we had an accumulated deficit of $157.8 million. We expect to continue to incur significant losses for the foreseeable future, and we expect these losses to increase as we continue our research and development of, and seek regulatory approvals for, our product candidates, SRK-015 and SRK-181, and any future product candidates.

We anticipate that our expenses will increase substantially if, and as, we:

- advance the development of SRK-015 through Phase 2 clinical development, SRK-181 through Phase 1 clinical development, and, if either product candidate is successful, into later-stage clinical trials;
- advance our other preclinical development programs into clinical development, and identify additional product candidates;
- seek regulatory approvals for any product candidates that successfully complete clinical trials;
- increase the amount of research and development activities to identify and develop new product candidates using our proprietary platform technology;
- hire additional clinical development, manufacturing and scientific personnel as we continue to develop our product candidates;
- expand our operational, financial and management systems and increase personnel, including personnel to support our clinical development, manufacturing and commercialization efforts and our operations as a public company;
- maintain, expand and protect our intellectual property portfolio;
- establish a sales, marketing, medical affairs and distribution infrastructure to commercialize any products for which we may receive marketing approval and intend to commercialize on our own or jointly with third parties; and
- invest in or in-license other technologies.

To become and remain profitable, we or any current or potential future collaborators must develop and eventually commercialize products with significant market potential and favorable pricing. This will require us to be successful in a range of challenging activities, including completing preclinical studies and clinical trials, receiving marketing approval

for product candidates, manufacturing, marketing and selling products for which we may receive marketing approval and satisfying any post-marketing requirements. We may never succeed in any or all of these activities and, even if we do, we may never generate revenue that is significant or large enough to achieve profitability. If we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable could decrease the value of our company and could impair our ability to raise capital, maintain our research and development efforts, expand our business or continue our operations. A decline in the value of our company could cause you to lose all or part of your investment.

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

We will require additional capital to fund our operations and if we fail to obtain necessary capital, we will not be able to complete the development and commercialization of SRK-015, SRK-181 and any future product candidates.

Our operations have consumed substantial amounts of cash since inception. We expect to continue to spend substantial amounts of cash to conduct further research and development, including clinical trials for SRK-015 and SRK-181 and preclinical studies and clinical trials for any future product candidates, to seek regulatory approvals for our product candidates and to launch and commercialize any products for which we receive regulatory approval. As of December 31, 2019, we had approximately $157.4 million in cash and cash equivalents and marketable securities. Based on our current operating plan, we believe that our existing cash and cash equivalents and marketable securities as of December 31, 2019 will be sufficient to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2021. However, our future capital requirements and the period for which our existing resources will support our operations may vary significantly from what we expect, and we will in any event require additional capital in order to complete clinical development of any of our current programs. Our monthly spending levels will vary based on new and ongoing development and corporate activities. Because the length of time and activities associated with development of our product candidates is highly uncertain, we are unable to estimate the actual funds we will require for development and any approved marketing and commercialization activities. Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the initiation, progress, timing, costs and results of clinical trials for SRK-015 and SRK-181 and preclinical studies and clinical trials for any future product candidates;
- the clinical development plans we establish for our product candidates;
- the number and characteristics of product candidates that we identify and develop;
- the terms of any collaboration, strategic alliance, or licensing agreements we are currently party to or may choose to enter into in the future;
- the outcome, timing and cost of meeting regulatory requirements established by the FDA, the EMA, and other comparable foreign regulatory authorities;
- the cost of filing, prosecuting, defending and enforcing our patent claims and other intellectual property rights;
- the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us or our product candidates;
- the effect of competing technological and market developments;

- the cost and timing of developing research cell lines and development and completion of commercial scale outsourced manufacturing activities; and

- the cost of establishing sales, marketing and distribution capabilities for any product candidates for which we may receive regulatory approval in regions where we choose to commercialize our products on our own.

We do not have any committed external source of funds or other support for our development efforts other than pursuant to our Gilead Collaboration Agreement and our license agreement with Janssen, which payments we may not receive in full or at all, and we cannot be certain that additional funding will be available on acceptable terms, or at all. Even if we receive the maximum payments under the Gilead Collaboration Agreement or license agreement with Janssen, the payments may not meet our current or future funding requirements. Until we can generate sufficient product or royalty revenue to finance our cash requirements, which we may never do, we expect to finance our future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing or distribution arrangements. If we raise additional funds through public or private equity offerings, the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. Further, to the extent that we raise additional capital through the sale of common stock or securities convertible or exchangeable into common stock, your ownership interest will be diluted. In addition, any debt financing may subject us to fixed payment obligations and covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional capital through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish certain valuable rights to our product candidates, technologies, future revenue streams or research programs or grant licenses on terms that may not be favorable to us. We also could be required to seek collaborators for SRK-015, SRK-181 or any future product candidate at an earlier stage than otherwise would be desirable or relinquish our rights to product candidates or technologies that we otherwise would seek to develop or commercialize ourselves. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of SRK-015, SRK-181 or one or more of our future product candidates or other research and development initiatives. Any of the above events could significantly harm our business, prospects, financial condition and results of operations and cause the price of our common stock to decline.

Our business is highly dependent on the success of our product candidates, SRK-015 and SRK-181 and any future product candidates that are generated from our other preclinical programs. SRK-015 and SRK-181 will require significant additional clinical development before we may be able to seek regulatory approval for and launch either product candidate commercially.

We are very early in our development efforts. We recently completed enrollment of patients in the TOPAZ Phase 2 clinical trial of SRK-015 in the fourth quarter of 2019. We have initiated a Phase 1 clinical trial of SRK-181 in cancer immunotherapy in the first quarter of 2020. Because SRK-015 and SRK-181, our product candidates, are our only clinical stage product candidates, if SRK-015 or SRK-181 encounters safety or efficacy problems, development delays, or regulatory issues or other problems, our development plans and business would be negatively affected. All of our other programs are in preclinical development.

SRK-015 and SRK-181 require additional clinical development, regulatory review and approval in one or more jurisdictions, substantial investment, and access to sufficient commercial manufacturing capacity and significant marketing efforts before we can generate any revenue from product sales. 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 preclinical studies, clinical trials, regulatory review or approval of, or that adversely affect our ability to commercialize our product candidates, including:

- negative or inconclusive results from our preclinical studies or 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 subjects in our clinical trials or by individuals using drugs or therapeutic biologics similar to our product candidates;

- delays in submitting Investigational New Drug applications ("INDs") or comparable foreign applications or delays or failure in receiving 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, EMA or comparable foreign authorities regarding the scope or design of our clinical trials;

- challenges in identifying or recruiting sufficient study sites or investigators for clinical trials;

- delays in enrolling subjects in clinical trials;

- high drop-out rates of subjects from clinical trials;

- inadequate supply of or quality issues related to product candidates or other materials necessary for the conduct of our clinical trials;

- greater than anticipated clinical trial costs;

- poor effectiveness or safety profile of our product candidates during clinical trials;

- unfavorable FDA, EMA or other regulatory agency inspection and review of clinical trial sites;

- 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 data by the FDA, EMA and similar foreign regulatory agencies.

Our approach to the discovery and development of innovative medicines for the treatment of serious diseases in which signaling by protein growth factors plays a fundamental role is based on our proprietary platform, which is unproven and may not result in marketable products.

Our proprietary platform is designed to discover and develop monoclonal antibodies that have a high degree of specificity to achieve selective modulation of growth factor signaling. Our approach is rooted in our structural biology insights into the mechanism by which certain growth factors are activated in close proximity to the cell surface. We integrate these insights with sophisticated protein expression, assay development and monoclonal antibody discovery capabilities. However, the scientific research that forms the basis of our efforts to develop product candidates utilizing our proprietary platform is ongoing. We may ultimately discover that our proprietary platform and any product candidates resulting therefrom do not possess properties required for therapeutic effectiveness. As a result, we may never succeed in developing a marketable product. If our product candidates discovered utilizing our proprietary platform prove to be ineffective, unsafe or commercially unviable, our entire proprietary 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.

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

As our clinical development plans and strategies develop, we expect we will need to hire additional managerial, clinical development, scientific, regulatory, and administrative personnel. Our ability to compete in the highly competitive oncology and immuno-oncology fields depends upon our ability to attract and retain highly qualified specialized personnel. If our product candidates approach commercialization, we will also need to hire sales, marketing and other commercial personnel. Future growth would impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, maintaining and motivating additional employees;
- managing our development efforts effectively, including the clinical and regulatory review process for SRK-015, SRK-181, and any future product candidates, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

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

We currently rely, and for the foreseeable future will continue to rely, in substantial part on independent organizations, advisors and consultants to provide certain services, including contract manufacturers and companies focused on antibody development and discovery activities. There can be no assurance that the services of independent organizations, advisors and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality, accuracy or quantity of the services provided is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to receive, or may be substantially delayed in receiving, regulatory approval of our product candidates or otherwise advance our business. There can be no assurance that we will be able to manage our existing consultants or find other competent outside contractors and consultants on economically reasonable terms, or at all.

We may not be able to attract or retain qualified management and scientific personnel in the future due to the intense competition for a limited number of qualified personnel in the biopharmaceutical space, especially those engaged in oncology and immuno-oncology. Many of the other pharmaceutical companies that we compete against for qualified personnel have greater financial resources, different risk profiles and a longer history in the industry than we do. They also may provide more diverse opportunities and better chances for career advancement. Some of these characteristics may be more appealing to high quality candidates than what we have to offer. If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop and commercialize SRK-015, SRK-181 or any future product candidates and, accordingly, may not achieve our research, development and commercialization goals.

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

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, scientific and medical personnel and our ability to continue to attract, retain and motivate highly skilled junior, mid-level and senior scientific and medical personnel. The loss of the services of any of our executive officers, other key employees, and scientific and medical advisors, and our inability to find suitable replacements could result in delays in product development and harm our business.

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

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we award stock options that vest over time. Additionally, restricted stock was awarded to employees at the time of the Company's Reorganization. The value to employees of restricted stock awards and stock options that vest over time may be significantly affected by movements in our stock price that are beyond our control, and may at any time be insufficient to counteract more lucrative offers from other companies. Despite our efforts to retain valuable employees, members of our management, scientific and development teams may terminate their employment with us on short notice. Although we have employment agreements with our executives, these employment agreements provide for at-will employment, which means that any of our employees could leave our employment at any time, with or without notice.

Our executives and highly skilled technical and managerial personnel are critical to our business, and they may not remain with us.

Our performance substantially depends on the performance of our management team. The loss of the services of any of our executives or highly skilled technical and managerial personnel could cause us to incur increased operating expenses and divert senior management resources in searching for replacements. We do not have a Chief Financial Officer, and our other executives have taken on substantially more responsibility for the management of our business and of our financial reporting. These changes in our organization may have a disruptive impact on our ability to implement our strategy and could have a material adverse effect on our business, internal controls, financial condition and results of operations. Management transition inherently causes some loss of institutional knowledge, which can negatively affect strategy and execution. Until we find a new Chief Financial Officer, or if we have additional changes to our executives or highly skilled technical and managerial personnel, we may be unable to successfully manage and grow our business, and our results of operations, internal controls and financial condition could suffer as a result. The loss of the services of our executives or other personnel also could harm our reputation.

Our internal computer systems, or those used by our contract research organizations, or other contractors or consultants, may fail or suffer security breaches.

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

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

We are exposed to the risk of employee fraud or other illegal activity by our employees, independent contractors, consultants, commercial partners and vendors. Misconduct by these parties could include intentional, reckless and/or negligent conduct that fails to comply with the laws of the FDA, EMA and other similar foreign regulatory bodies; provide true, complete and accurate information to the FDA, EMA and other similar foreign regulatory bodies; comply with manufacturing standards we have established; comply with healthcare fraud and abuse laws in the U.S. and similar foreign fraudulent misconduct laws; or report financial information or data accurately or to disclose unauthorized activities to us. If we receive FDA approval of any of our product candidates and begin commercializing those products

in the U.S., our potential exposure under such laws will increase significantly, and our costs associated with compliance with such laws are also likely to increase. These laws may impact, among other things, our current activities with principal investigators and research patients, as well as proposed and future sales, marketing and education programs. We have adopted a code of business conduct and ethics, but it is not always possible to identify and deter misconduct by our employees, independent contractors, consultants, commercial partners and vendors, 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 comply with these laws or regulations. If any actions are instituted against us and we are not successful in defending ourselves or asserting our rights, those actions could result in the imposition of civil, criminal and administrative penalties, damages, monetary fines, individual imprisonment, disgorgement, possible exclusion from participation in government healthcare programs, additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, contractual damages, reputational harm, diminished profits and future earnings and the curtailment of our operations, any of which could adversely affect our ability to operate our business, financial condition and results of operations.

Inadequate funding for the FDA, the SEC and other government agencies, including from government shut downs, could prevent new products and services from being developed or commercialized in a timely manner or otherwise prevent those agencies from performing normal business functions on which the operation of our business may rely, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other agencies on which our operations may rely, including those that fund research and development activities, is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA and other government employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Future shutdowns could also affect other government agencies such as the SEC, which may also impact our business by delaying review of our public filings, to the extent such review is necessary, and our ability to access the public markets.

Risks Related to Research and Development and the Biopharmaceutical Industry

Preclinical development is uncertain. Our preclinical programs may experience delays or may never advance to clinical trials, which would adversely affect our ability to develop our product pipeline and receive regulatory approvals or commercialize these programs on a timely basis or at all, which would have an adverse effect on our business.

We have two product candidates, SRK-015 and SRK-181, and may not nominate any other product candidates for any of our programs. Before we can commence clinical trials for any product candidate, we must complete extensive preclinical studies that support our planned INDs in the U.S., or similar applications in other jurisdictions. We cannot be certain of the timely completion or outcome of our preclinical studies and cannot predict if the FDA, EMA or other regulatory authorities will accept our proposed clinical programs or if the outcome of our preclinical studies will ultimately support the further development of our programs. As a result, we cannot be sure that we will be able to submit INDs or similar applications for our preclinical programs on the timelines we expect, if at all, and we cannot be sure that submission of INDs or similar applications will result in the FDA, the EMA or other regulatory authorities allowing clinical trials to begin.

Conducting preclinical testing can be a lengthy, time-consuming and expensive process. The time required for such testing may vary substantially according to the type, complexity and novelty of the program, and can be several years or

more per program. Delays associated with programs for which we are conducting preclinical testing and studies may cause us to incur additional operating expenses. We also may be affected by delays associated with the preclinical testing and studies of certain programs that are the responsibility of our collaborators or our potential future collaborators over which we have limited or no control. The commencement and rate of completion of preclinical studies for a product candidate may be delayed by many factors, including, for example, challenges in reaching consensus with regulatory agencies regarding the scope of the necessary preclinical study program and/or appropriate preclinical study designs.

Due to our limited resources and access to capital, we must prioritize development of certain programs and product candidates; these decisions may prove to be wrong and may adversely affect our business.

We may fail to identify viable new product candidates for clinical development from our current or future research programs for a number of reasons. If we fail to identify additional potential product candidates, our business could be materially harmed.

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

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

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

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

The successful development of biopharmaceuticals is highly uncertain.

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

- preclinical study results may show the product candidate to be less effective than desired or to have harmful or problematic side effects;
- clinical trial results may show the product candidates to be less effective than expected (e.g., a clinical trial could fail to meet its primary endpoint(s)) or to have unacceptable side effects or toxicities;

- delay or failure to receive the necessary regulatory approvals. Among other things, such delays may be caused by slow enrollment in clinical trials, patients dropping out of trials, length of time to achieve trial endpoints, additional time requirements for data analysis or BLA preparation, discussions with the FDA, an FDA request for additional preclinical or clinical data, or unexpected safety or manufacturing issues;

- manufacturing costs, formulation issues, pricing or reimbursement issues, or other factors that make a product candidate uneconomical; and

- the proprietary rights of others and their competing products and technologies that may prevent one of our product candidates from being commercialized.

The length of time necessary to complete clinical trials and to submit an application for marketing approval for a final decision by a regulatory authority varies significantly from one product candidate to the next, and may be difficult to predict.

Even if we are successful in getting market approval, commercial success of any approved products will also depend in large part on the availability of coverage and adequate reimbursement from third-party payors, including government payors such as the Medicare and Medicaid programs and managed care organizations, which may be affected by existing and future health care reform measures designed to reduce the cost of health care. Third-party payors could require us to conduct additional studies, including post-marketing studies related to the cost-effectiveness of a product, to qualify for reimbursement, which could be costly and divert our resources. If government and other health care payors were not to provide coverage and adequate reimbursement levels for one any of our products once approved, market acceptance and commercial success would be reduced.

In addition, if any of our product candidates is approved for marketing, we will be subject to significant ongoing regulatory obligations, including the submission of safety and other post-marketing information and reports and registration, compliance (or assuring our third-party providers' compliance) with current good manufacturing practices ("cGMPs"), and compliance with GCPs for any clinical trials that we conduct post-approval. In addition, we or a regulatory authority may identify previously unknown problems with a product post-approval, such as adverse events of unanticipated severity or frequency. Compliance with these post-approval requirements is costly, and any failure to comply or other issues with our product candidates post-approval could adversely affect our business, financial condition and results of operations.

Clinical development involves a lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of SRK-015, SRK-181, or any future product candidates.

To receive the requisite regulatory approvals to commercialize any product candidates, we must demonstrate through extensive clinical trials that our product candidates are safe and effective in humans. Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. We may be unable to establish clinical endpoints that applicable regulatory authorities would consider clinically meaningful, and a clinical trial can fail at any stage of testing. Differences in trial design between early-stage clinical trials and later-stage clinical trials make it difficult to extrapolate the results of earlier clinical trials to later clinical trials. Moreover, clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in clinical trials have nonetheless failed to receive marketing approval of their products.

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

We may experience delays in initiating or completing clinical trials. We also may experience numerous unforeseen events during, or as a result of, any clinical trials in process or any future clinical trials that we could conduct that could

delay or prevent our ability to receive marketing approval or commercialize SRK-015, SRK-181 or any future product candidates, including:

- delay or inability to reach agreement with the FDA or comparable foreign regulatory authorities on acceptable clinical trial design;
- regulators, IRBs or ethics committees may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable terms with prospective trial sites and prospective CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- failure by our collaborators to provide us with an adequate and timely supply of product that complies with the applicable quality and regulatory requirements for a combination trial;
- the possibility that collaborators may delay clinical trials, fail to supply us on a timely basis with the product required for a combination trial, deliver product that fails to meet appropriate quality and regulatory standards and results in a market recall or withdrawal, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a drug candidate, repeat or conduct new clinical trials or require a new formulation of a drug candidate for clinical testing;
- clinical trials of any product candidates may fail to show safety and effectiveness, or produce negative or inconclusive results and we may decide, or regulators may require us, to conduct additional preclinical studies or clinical trials or we may decide to abandon product development programs;
- the number of subjects required for clinical trials of any product candidates may be larger than we anticipate, enrollment in these clinical trials may be slower or more challenging than we anticipate or subjects may drop out of these clinical trials or fail to return for post treatment follow-up at a higher rate than we anticipate;
- challenges in identifying or recruiting sufficient study sites or investigators for clinical trials;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all,
- clinical study sites or clinical investigators may deviate from the clinical trial protocol or drop out of the trial, which may require that we add new clinical trial sites or investigators;
- we may elect to, or regulators, IRBs or ethics committees may require that we or our investigators, suspend or terminate clinical research or trials for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- limitations on our ability to access and verify clinical trial data captured at clinical study sites through monitoring and source document verification;
- the cost of clinical trials of a product candidate may be greater than we anticipate;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate to initiate or complete a given clinical trial;

- our product candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators, IRBs or ethics committees to suspend or terminate the trials, or reports from clinical testing of other therapies may raise safety or efficacy concerns about our product candidates;

- our failure to establish an appropriate safety profile for a product candidate based on clinical or preclinical data for such product candidate and/or data emerging from other molecules in the same class as our product candidate;

- the FDA, EMA or other regulatory authorities may require us to submit additional data such as long-term toxicology studies, or impose other requirements before permitting us to initiate a clinical trial

- evolution in the standard of care or changes in applicable governmental regulations or policies during the development of a product candidate that require amendments to ongoing clinical trials and/or the conduct of additional preclinical studies or clinical trials; and

- lack of adequate funding to complete a clinical trial.

We could also encounter delays if a clinical trial is placed on clinical hold, suspended or terminated by us, the IRBs of the institutions in which such trials are being conducted, or the FDA, EMA or other regulatory authorities, or if a clinical trial is recommended for suspension or termination by the Data Safety Monitoring Board ("DSMB") for such trial. A suspension or termination may be imposed 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, EMA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product or treatment, failure to establish or achieve clinically meaningful trial endpoints, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial.

Additionally, timely enrollment in clinical trials is reliant on clinical trial sites which may be adversely affected by global health matters, including, among other things pandemics. For example, some of our clinical trial sites are located in regions currently being afflicted by the COVID-19 coronavirus. Some factors from the COVID-19 coronavirus outbreak that could adversely affect enrollment in our trials include:

- the diversion of healthcare resources away from the conduct of clinical trial matters to focus on pandemic concerns, including the attention of physicians serving as our clinical trial investigators, hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;

- limitations on travel that interrupt key trial activities, such as clinical trial site initiations and monitoring, or that limit the ability of a patient to participate in a clinical trial or delay access to drug dosing or assessments;

- interruption in global shipping affecting the transport of clinical trial materials, such as investigational drug product used in our trials; and

- employee furlough days that delay necessary interactions with local regulators, ethics committees and other important agencies and contractors.

If a patient participating in one of our clinical trials contracts the COVID-19 coronavirus, this could negatively impact the data readouts from these trials; for example, this could result in such patient being unable to participate further (or limit their participation) in our clinical trial, such patient having a health impact that results in lower efficacy assessment scores than had they not been infected, or such patient experiencing an adverse event for which the underlying cause could be attributed to our drug product.

These and other factors arising from the COVID-19 coronavirus could worsen in countries that are already afflicted with the virus or could continue to spread to additional countries, each of which may further adversely impact our clinical trials. The global outbreak of the COVID-19 coronavirus continues to evolve and the conduct of our trials may be adversely affected, despite efforts to mitigate this impact.

Many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates. Further, the FDA, EMA or other regulatory authorities may disagree with our clinical trial design and our interpretation of data from clinical trials, or may change the requirements for approval even after they have reviewed and commented on the design for our clinical trials. For example, we anticipate some of our future trials to, in part, utilize an "open-label" trial design, and our ongoing Phase 1 clinical trial for SRK-181 in cancer immunotherapy and our ongoing TOPAZ Phase 2 clinical trial for SRK-015 in Type 2 and Type 3 SMA, in part, utilizes an open-label trial design. An open-label trial is one where both the patient and investigator know whether the patient is receiving the test article or either an existing approved drug or placebo. Open-label trials are subject to various limitations that may exaggerate any therapeutic effect as patients in open-label studies are aware that they are receiving treatment. Open-label trials may be subject to a "patient bias," for example if patients perceive their symptoms to have improved merely due to their awareness of receiving an experimental treatment. In addition, patients selected for early clinical trials often have more severe forms of a disease or condition and their symptoms may have been bound to improve notwithstanding the product candidate under investigation. Open-label trials also may be subject to an "investigator bias" where those assessing and reviewing the physiological outcomes of the clinical trials are aware of which patients have received treatment and may interpret the information of the treated group more favorably given this knowledge. The potential sources of bias in clinical trials as a result of open-label design may not be adequately mitigated and may cause any of our trials that utilize such design to fail and additional trials may be necessary to support future marketing applications. Further, the FDA, EMA or other regulatory authorities may change the requirements for approval even after they have reviewed and commented on the design for our clinical trials.

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

Our clinical development strategy depends on the continued use and availability of certain third party approved drug therapies.

SRK-015 and SRK-181 are our two clinical-stage product candidates. Certain patients in our TOPAZ Phase 2 clinical trial are receiving SRK-015 in conjunction with an approved SMN upregulator therapy such as nusinersen. These patients are reliant on the continued use and availability of such therapies. If access to an approved SMN upregulator therapy such as nusinersen becomes limited or is unavailable, we may be forced to pause or stop our TOPAZ trial, or the medical condition of patients may be affected which could negatively affect the efficacy and safety results for SRK-015 in the trial. We have also initiated a Phase 1 clinical trial of SRK-181 in patients with locally advanced or metastatic solid tumors that exhibit primary resistance to anti-PD-(L)1 antibody therapies. Certain patients in this clinical trial will receive SRK-181 in conjunction with an approved anti-PD-(L)1 therapy. If access to the approved anti-PD-(L)1 therapy becomes limited or is unavailable, we may not be able to enroll, or may be delayed in enrolling patients or may be forced to pause or stop our Phase 1 clinical trial, or the medical condition of patients may be affected which could negatively affect the efficacy and safety results for SRK-181 in the trial. Any delay or suspension of our clinical trials would significantly and adversely affect our business prospects.

The results of preclinical studies and early-stage clinical trials may not be predictive of future results. Success of a product candidate in an early-stage clinical trial may not be replicated in later-stage trials.

The results of preclinical studies and early-stage clinical trials may not be predictive of the results of future clinical trials. Preclinical studies and early-stage clinical trials are primarily designed to study PK and PD, understand the side effects of product candidates, and evaluate various doses and dosing schedules. Our current or future product candidates may demonstrate different chemical, biological and pharmacological properties in patients than they do in laboratory studies or may interact with human biological systems in unforeseen or harmful ways. Product candidates in later-stages of clinical trials may fail to show desired pharmacological properties or produce the necessary safety and efficacy results despite having progressed through preclinical studies and initial clinical trials. We recently completed a Phase 1 trial for SRK-015 in healthy adult volunteers and have advanced SRK-015 to a Phase 2 trial in Type 2 and Type 3 SMA. We also recently initiated a Phase 1 trial for SRK-181 in cancer immunotherapy. We cannot assure you that the Phase 1 trial, Phase 2 trial, or any other future clinical trials of SRK-181 or SRK-015, will show positive results. There can be no assurance that any of our current or future clinical trials will ultimately be successful or support further clinical development of any of our product candidates. There is a high failure rate for drugs and biologics proceeding through clinical trials. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical development even after achieving promising results in earlier studies, and any such setbacks in our clinical development could have a material adverse effect on our business and operating results.

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

From time to time, we may publish interim data, including interim top-line results or preliminary results from our clinical trials. For example, we expect to receive interim efficacy data for our TOPAZ Phase 2 clinical trial for SRK-015 in mid-2020. This interim data and other results from our clinical trials may materially change as more patient data become available. Preliminary or top-line results also remain subject to audit, validation and verification procedures that may result in the final data being materially different from the interim and preliminary data we previously published. As a result, interim and preliminary data may not be predictive of final results and should be viewed with caution until the final data are available. Differences between preliminary or interim data and final data could adversely affect our business.

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

If significant adverse events or other side effects are observed in any of our clinical trials, we may have difficulty recruiting patients to our clinical trials, patients may drop out of our trials, or we may be required to abandon the trials or our development efforts of one or more product candidates altogether. We, the FDA, EMA or other applicable regulatory authorities, or an IRB may suspend clinical trials of a product candidate at any time for various reasons, including a belief that subjects or patients in such trials are being exposed to unacceptable health risks or adverse side effects. Some potential therapeutics developed in the biotechnology industry that initially showed therapeutic promise in early-stage trials have later been found to cause side effects that prevented their further development. The side effects could result in a number of potentially significant negative consequences, including:

- we may suspend marketing of such product;
- regulatory authorities may refuse to grant market approval to a product candidate or withdraw approvals of such product;
- regulatory authorities may require additional warnings on the label for such product;
- we may be required to develop a REMS for such a product, or if a REMS is already in place, to incorporate additional requirements under the REMS, or to develop a similar strategy as required by a comparable foreign regulatory authority;
- we may be required to conduct additional post-market studies;

- we could be sued and held liable for harm caused subjects or patients; or
- our reputation may suffer.

Any of these developments could adversely affect our prospects for receiving or maintaining approval for our product candidates and/or inhibit market acceptance of any approved product and could materially harm our business, financial condition and prospects.

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

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

- the patient eligibility and exclusion criteria defined in the protocol;
- the size of the patient population required for analysis of the trial's primary endpoints;
- the number and location of participating trial sites;
- the proximity of patients to trial sites;
- the design of the trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions as to the potential advantages and risks of the product candidate being studied in relation to other available therapies;
- our ability to obtain and maintain patient consents; and
- the risk that patients enrolled in clinical trials will drop-out of the trials before completion.

For example, we are initially developing SRK-015 for the treatment of SMA, a rare disease, affecting an estimated 30,000 to 35,000 patients in the U.S. and Europe. As a result, we may encounter difficulties enrolling patients in our clinical trials for SRK-015 due, in part, to the small size of this patient population. In addition, our clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as our product candidates, and this competition will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our trials may instead opt to enroll in a trial being conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials in such clinical trial site. Additionally, patients may opt out of participation in clinical trials in favor of treatment with FDA-approved therapies.

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

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

We face an inherent risk of product liability as a result of testing SRK-015, SRK-181 and any of our future product candidates in clinical trials and will face an even greater risk if we commercialize any products, if approved. For example, we may be sued if our product candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical trials, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

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

Our inability to obtain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop, alone or with collaborators. We may be unable to obtain, or may obtain on unfavorable terms, additional clinical trial insurance in amounts adequate to cover any liabilities from any of our clinical trials. Our insurance policies may also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

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

The biopharmaceutical industry is characterized by intense competition and rapid innovation. Our competitors may be able to develop other drugs that are able to achieve similar or better results. Our potential competitors include major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical companies and universities and other research institutions. Many of our competitors have substantially greater financial, technical and

other resources, such as larger research and development staff and experienced marketing and manufacturing organizations and well-established sales forces. Smaller or early-stage companies may also prove to be significant competitors, particularly as they develop novel approaches to treating disease indications that our product candidates are also focused on treating. Established pharmaceutical companies may also invest heavily to accelerate discovery and development of novel therapeutics or to in-license novel therapeutics that could make the product candidates that we develop obsolete. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors, either alone or with collaborative partners, may succeed in developing, acquiring or licensing on an exclusive basis drug or biologic products that are more effective, safer, more easily commercialized or less costly than our product candidates or may develop proprietary technologies or secure patent protection that we may need for the development of our technologies and products. We believe the key competitive factors that will affect the development and commercial success of our product candidates are safety, efficacy, tolerability, reliability, convenience of use, price and reimbursement.

We anticipate competing with other companies that are focused on treating disease indications that our product candidates are also focused on treating. A competitor may develop technologies focused on the same disease pathway as our technology or may focus on treating the targeted disease in a completely different manner. To the extent a new drug is developed that is more efficacious than any product candidate developed by us, this could reduce or negate the need for our product candidate. In addition, while we believe our product candidates may be used in conjunction with existing or emerging standard of care in certain disease indications, including SMA and cancer, as companies continue to improve upon existing standard of care, more efficacious drug therapies could become available, reducing or completely negating the benefit of our product candidates. Our competitors may also include companies that are or will be developing therapies for the same therapeutic areas that we are targeting within our early pipeline, including neuromuscular disorders, cancer, fibrosis and anemia.

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

Even if a product candidate we develop receives marketing approval, it may fail to achieve the degree of market acceptance by physicians, patients, third-party payors and others in the medical community necessary for commercial success.

If SRK-015, SRK-181 or any future product candidate we develop receives marketing approval, whether as a single agent or in combination with other therapies, it may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors, and others in the medical community. For example, doctors may deem it sufficient to treat patients with SMA with an SMN upregulator such as nusinersen, and therefore will not be willing to utilize SRK-015 in conjunction with such SMN upregulator. If the product candidates we develop do not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable. The degree of market acceptance of any product candidate, if approved for commercial sale, will depend on a number of factors, including:

- efficacy and potential advantages compared to alternative treatments;
- the ability to offer our products, if approved, for sale at competitive prices;
- convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support;

- the ability to obtain sufficient third-party coverage and adequate reimbursement; and
- the prevalence and severity of any side effects.

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

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

Although we maintain workers' compensation insurance to cover us for costs and expenses, we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities. We do not carry specific biological waste or hazardous waste insurance coverage, workers compensation or property and casualty and general liability insurance policies that include coverage for damages and fines arising from biological or hazardous waste exposure or contamination.

Changes in tax law could adversely affect our business and financial condition.

The rules dealing with U.S. federal, state, and local income taxation are constantly under review by persons involved in the legislative process and by the Internal Revenue Service and the U.S. Treasury Department. Changes to tax laws (which changes may have retroactive application) could adversely affect us or holders of our common stock. In recent years, many such changes have been made and changes are likely to continue to occur in the future. Future changes in tax laws could have a material adverse effect on our business, cash flow, financial condition or results of operations. We urge investors to consult with their legal and tax advisers regarding the implications of potential changes in tax laws on an investment in our common stock.

Our ability to use our net operating loss carryforwards and certain tax credit carryforwards may be subject to limitation.

As of December 31, 2019, we had net operating loss carryforwards for federal and state income tax purposes of $98.1 million and $100.1 million, respectively, which begin to expire in 2032, except for our 2018 and 2019 federal net operating loss carryforwards of $47.6 million which do not expire. As of December 31, 2019, we also had available tax credit carryforwards for federal and state income tax purposes of $8.0 million and $2.0 million, respectively, which begin to expire in 2032 and 2020, respectively. Federal net operating losses generated after December 31, 2017 are not subject to expiration, but may not be carried back to prior taxable years. Additionally, the deductibility of such federal net operating losses is limited to 80% of our taxable income in any future taxable year. Under Section-382 of the Internal Revenue Code of 1986, as amended (the "Code"), changes in our ownership may limit the amount of our net operating loss carryforwards and tax credit carryforwards that could be utilized annually to offset our future taxable income, if any. This limitation would generally apply in the event of a cumulative change in ownership of our company of more than

50% within a three-year period. Any such limitation may significantly reduce our ability to utilize our net operating loss carryforwards and tax credit carryforwards before they expire. Private placements and other transactions that have occurred since our inception, as well as our initial public offering ("IPO"), may trigger such an ownership change pursuant to Section 382 of the Code. Any such limitation, whether as the result of our IPO, prior private placements, sales of our common stock by our existing stockholders or additional sales of our common stock by us, could have a material adverse effect on our results of operations in future years.

Our current operations are concentrated in one location, and we or the third parties upon whom we depend may experience business interruptions and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster, including earthquakes, outbreak of disease or other natural disasters.

Our office and laboratory facilities are located in Cambridge, Massachusetts. We will be moving into a new location in Cambridge, Massachusetts in 2020. Any unplanned event, such as flood, fire, explosion, earthquake, extreme weather condition, medical epidemics, power shortage, telecommunication failure or other natural or manmade accidents or incidents that result in us being unable to fully utilize our facilities, the facilities at any clinical trial site, or the manufacturing facilities of our third-party contract manufacturers, or that makes us unable to, or delayed, in moving into our new facility, 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. 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 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. For example, in December 2019, an outbreak of a novel strain of coronavirus, or the COVID-19 coronavirus, originated in Wuhan, China. To date, this outbreak has already resulted in extended shutdowns of certain businesses in and has had ripple effects to businesses around the world. The extent to which the COVID-19 coronavirus impacts our business or operations will depend on future developments, which are highly uncertain and cannot be accurately predicted, including new information which may emerge concerning the severity of the COVID-19 coronavirus and the actions to contain the COVID-19 coronavirus or treat its impact, among others. Global health concerns, such as the COVID-19 coronavirus, could also result in social, economic, and labor instability in the countries in which we or the third parties with whom we engage operate. 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 may have a material and adverse effect on our business, financial condition, results of operations and prospects.

Facilities transitions could be disruptive to our operations and may result in unanticipated expense and adverse effects to our cash position and cash flows.

We plan to move into our new headquarters building in Cambridge, Massachusetts in 2020. This location represents our largest office and laboratory space to date in terms of square footage. Relocating our operations may be costly and could be disruptive and adversely affect productivity in the short term, including risk of delay for construction completion of our office and laboratory space. We could also face unanticipated expenses associated with the transition that could adversely impact our cash position and cash flows.

Risks Related to Government Regulation

The regulatory approval process for our product candidates in the U.S., EU and other jurisdictions is currently uncertain and will be lengthy, time-consuming and inherently unpredictable and we may experience significant delays in the clinical development and regulatory approval, if any, of our product candidates.

The research, testing, manufacturing, labeling, approval, sale, import, export, marketing, promotion and distribution of drug products, including biologics, are subject to extensive regulation by the FDA in the U.S. and other regulatory authorities outside the U.S. We are not permitted to market any biological product in the U.S. until we receive a biologics license from the FDA. We have not previously submitted a BLA to the FDA or similar marketing application to comparable foreign authorities. A BLA must include extensive preclinical and clinical data and supporting information to establish that the product candidate is safe, pure and potent for each desired indication. A BLA must also include significant information regarding the chemistry, manufacturing and controls for the product, and the manufacturing facilities must complete a successful pre-license inspection.

The FDA may seek independent advice from a panel of experts, referred to as an Advisory Committee, on complex or novel issues that may be presented in an application, including issues related to the adequacy of the safety and efficacy data to support approval. The opinion of the Advisory Committee, although not binding, may have a significant impact on our ability to receive approval of any product candidates that we develop based on the completed clinical trials.

In addition, clinical trials can be delayed or terminated for a variety of reasons, including issues, delays or failures related to:

- receiving regulatory authorization to begin a clinical trial, if applicable;
- the availability of financial resources to begin and complete the planned trials;
- 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 trial sites;
- identifying and maintaining a sufficient number of trial sites, some of which may already be engaged in other clinical trial programs, including some that may be for the same or similar indication;
- receiving approval at each clinical trial site by an independent IRB or ethics committee;
- recruiting a sufficient number of suitable patients to participate in and complete a trial in a timely manner;
- having patients complete a trial or return for post treatment follow-up;
- clinical trial sites and investigators adhering to the trial protocol, complying with GCP requirements and completing a trial;
- our third-party CROs and clinical sites satisfying their contractual duties and meeting expected deadlines;
- addressing any patient safety concerns that arise during the course of a clinical trial;
- addressing any conflicts with new or existing laws or regulations;
- adding new clinical trial sites; or
- manufacturing qualified materials under cGMP regulations for use in clinical trials.

Further, a clinical trial may be suspended or terminated by us, the IRBs for the institutions at which such trials are being conducted, or the FDA, the competent authorities and/or ethics committees of the EU Member States or other regulatory authorities, or recommended for suspension or termination by the DSMB for such trial, 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, EMA, competent authorities of the EU Member States or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product candidate, changes in governmental regulations or

administrative actions or lack of adequate funding to continue the clinical trial. If we experience termination of, or delays in the completion of, any clinical trial of our product candidates, the prospects for regulatory approval and commercial prospects for our product candidates will be harmed, and our ability to generate product revenue will be delayed. In addition, any delays in completing any clinical trials will increase our costs, slow down our product development and approval process and jeopardize our ability to commence product sales and generate revenue.

The FDA may disagree with our development plan and we may fail to receive regulatory approval of our product candidates.

FDA approval of a new biologic or drug generally requires dispositive data from two (and in some cases, one) adequate and well-controlled pivotal Phase 3 clinical trials of the biologic or drug in the relevant patient population. Phase 3 clinical trials typically involve hundreds of patients, have significant costs and take years to complete.

The results of our clinical trials may not support approval. Our product candidates could fail to receive regulatory approval for many reasons, including the following:

- the FDA, EMA or comparable foreign regulatory authorities may disagree with the design or implementation of our clinical trials;
- we may be unable to demonstrate to the satisfaction of the FDA, EMA or comparable foreign regulatory authorities that our product candidates are safe and effective for any of their proposed indications;
- the results of clinical trials may not meet the level of statistical significance required by the FDA, EMA or comparable foreign regulatory authorities for approval;
- we may be unable to demonstrate that our product candidates' clinical and other benefits outweigh their safety risks;
- the FDA, EMA or comparable foreign regulatory authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of our product candidates may not be sufficient to the satisfaction of the FDA, EMA or comparable foreign regulatory authorities to support the submission of a BLA or other comparable submission in foreign jurisdictions or to receive regulatory approval in the U.S. or elsewhere;
- the FDA, competent authorities of the EU Member States or comparable foreign regulatory authorities may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we contract for clinical and commercial supplies; and
- the approval policies or regulations of the FDA, EMA or comparable foreign regulatory authorities may significantly change in a manner rendering our clinical data insufficient for approval.

We have received Orphan Drug Designation from the FDA for SRK-015 for the treatment of SMA and the EC granted Orphan Medicinal Product Designation to SRK-015 for the treatment of SMA. We may seek Orphan Drug Designation from regulatory authorities in other jurisdictions for SRK-015 and Orphan Drug Designation from the FDA, EC or regulatory authorities in other jurisdictions for our future product candidates. In any of these instances, we may not receive the requested designation or we may be unable to realize the benefits associated with Orphan Drug Designation, including the potential for market exclusivity.

Under the Orphan Drug Act, the FDA may designate a product as an orphan drug if, among other things, it is intended to treat a rare disease or condition, defined as a patient population of fewer than 200,000 in the U.S., or a patient population greater than 200,000 in the U.S. where there is no reasonable expectation that the cost of developing the drug will be recovered from sales in the U.S. In the EU, after a recommendation from the EMA's COMP, the EC grants orphan

designation to promote the development of products that are (a) intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting not more than five in 10,000 persons in the EU, or (b) for the diagnosis, prevention or treatment of a life-threatening, seriously debilitating or serious and chronic condition when, without incentives, it is unlikely that sales of the medicinal product in the EU would generate sufficient return to justify the necessary investment in developing the medicinal product. Additionally, the orphan designation requires that there is no satisfactory method of diagnosis, prevention or treatment of the condition, or, if such a method exists, the medicinal product must be of significant benefit to those affected by the condition. Any orphan drug designation that we are granted for our product candidates in the U.S. or in the EU would not assure orphan drug designation of those product candidates in any other jurisdiction. Orphan drug designation neither shortens the development time or regulatory review time of a product candidate, nor gives the product candidate any advantage in the regulatory review or approval process (other than as discussed below).

In the U.S., orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers. In addition, if a product candidate receives the first FDA approval for the indication for which it has orphan designation, the product is entitled to orphan drug exclusivity for that indication. Orphan drug exclusivity means the FDA may not approve another application to market the same drug for the same indication for a period of seven years, except in limited circumstances, such as a showing of clinical superiority over the product with orphan exclusivity or where the manufacturer is unable to assure sufficient product quantity. In the EU, orphan designation entitles a party to scientific assistance regarding necessary tests and trials, financial incentives such as reduction of fees or fee waivers and ten years of market exclusivity following grant of marketing authorization for the medicinal product if the criteria for orphan designation continue to be met before the grant of the marketing authorization. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity.

We have received Orphan Drug Designation from the FDA for SRK-015 for the treatment of SMA, and following the EMA's COMP's positive opinion, the EC designated SRK-015 as an orphan medicinal product for the treatment of SMA. Even if we receive orphan drug exclusivity, the benefit of that exclusivity may be limited if we seek approval for an indication broader than the orphan-designated indication or could be revoked under certain circumstances, for example if the FDA later determines that the request for designation was materially defective or that we are unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. Further, even if we receive orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition during the exclusivity period because different drugs with different active moieties can be approved for the same condition, and the same product can be approved for different uses. Also, in the U.S., even after an orphan drug is approved and receives orphan drug exclusivity, the FDA may subsequently approve another drug for the same condition if the FDA concludes that the latter drug is not the same drug, including because it has been shown to be clinically superior to the drug with exclusivity because it is safer, more effective or makes a major contribution to patient care. In the EU, marketing authorization may be granted to a similar medicinal product for the same orphan indication if:

- the second applicant can establish in its application that its medicinal product, although similar to the orphan medicinal product already authorized, is safer, more effective or otherwise clinically superior; or
- the holder of the marketing authorization for the original orphan medicinal product consents to a second orphan medicinal product application; or
- the holder of the marketing authorization for the original orphan medicinal product cannot supply sufficient quantities of orphan medicinal product.

We may seek Breakthrough Therapy Designation or Fast Track Designation from the FDA for certain of our product candidates, and we may not be successful in receiving such designation, or if received, such designation may not actually lead to a faster development or regulatory review or approval process.

We may seek Breakthrough Therapy Designation or Fast Track Designation for certain of our product candidates.

A breakthrough therapy is defined as a product that is intended, alone or in combination with one or more other products, to treat a serious or life threatening disease or condition, and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Products that have been designated as breakthrough therapies are eligible for more frequent interaction and communication between the FDA and the sponsor, which can help to identify the most efficient path for clinical development, as well as rolling review. Products designated as breakthrough therapies by the FDA may also be eligible for (but are not assured) accelerated approval.

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

If a product is intended for the treatment of a serious or life-threatening condition and the product demonstrates the potential to address unmet medical needs for this condition, the product sponsor may apply for Fast Track Designation. Products receiving a Fast Track Designation are eligible for more frequent interaction and communication with FDA and rolling review. 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.

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

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

- the federal Anti-Kickback Statute, which prohibits, among other things, knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe, or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce, or in return for, either the referral of an individual, or the purchase, lease, order or recommendation of any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. A person or entity can be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal FCA. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers, and formulary

managers on the other. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution;

- the federal civil and criminal false claims laws and civil monetary penalty laws, including the FCA, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment to, or approval by Medicare, Medicaid, or other federal healthcare programs, knowingly making, using or causing to be made or using a false record or statement material to a false or fraudulent claim or an obligation to pay or transmit money to the federal government, or knowingly concealing or knowingly and improperly avoiding or decreasing or concealing an obligation to pay money to the federal government. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to "cause" the submission of false or fraudulent claims. The government may deem manufacturers to have "caused" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. The FCA also permits a private individual acting as a "whistleblower" to bring actions on behalf of the federal government alleging violations of the FCA and to share in any monetary recovery;

- the federal HIPAA, which created additional federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations, or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters. Similar to the federal Anti-Kickback Statute, a person or entity can be found guilty of violating HIPAA without actual knowledge of the statute or specific intent to violate it;

- HIPAA, as amended by the HITECH, and their respective implementing regulations, which impose, among other things, requirements on certain covered healthcare providers, health plans, and healthcare clearinghouses, known as covered entities, as well as their respective business associates, independent contractors that perform services for covered entities that involve the use, or disclosure of, individually identifiable health information, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions;

- the federal Physician Payments Sunshine Act, created under the Patient Protection and ACA, and its implementing regulations, which require some manufacturers of drugs, devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the HHS information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members. Effective January 1, 2022, these reporting obligations will extend to include transfers of value made to certain non-physician providers such as physician assistants and nurse practitioners;

- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers; and

- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which 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 may be broader in scope than their federal equivalents; state and foreign 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 or otherwise restrict payments that may be made to healthcare providers; state and foreign laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; state and local laws that require the registration of pharmaceutical sales representatives; and state and foreign 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.

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

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

In addition, there has been a trend of increased state regulation of payments made to physicians for marketing. Some states mandate implementation of corporate compliance programs, along with the tracking and reporting of gifts, compensation, and other remuneration to physicians.

It is possible that governmental and enforcement authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law interpreting applicable fraud and abuse or other healthcare laws and regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, fines, disgorgement, individual imprisonment, possible exclusion from participation in federal and state funded healthcare programs, contractual damages and the curtailment or restricting of our operations, as well as additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws. Any action for violation of these laws, even if successfully defended, could cause a pharmaceutical manufacturer to incur significant legal expenses and divert management's attention from the operation of the business. Prohibitions or restrictions on sales or withdrawal of future marketed products could materially affect business in an adverse way.

Receiving and maintaining regulatory approval of our product candidates in one jurisdiction does not mean that we will be successful in receiving or maintaining regulatory approval of our product candidates in other jurisdictions.

Receiving and maintaining regulatory approval of our product candidates in one jurisdiction does not guarantee that we will be able to receive or maintain regulatory approval in any other jurisdiction, but a failure or delay in receiving regulatory approval in one jurisdiction may have a negative effect on the regulatory approval process in other jurisdictions. Even if the FDA grants marketing approval of a product candidate, the EC, the competent authorities of EU Member States or comparable regulatory authorities in foreign jurisdictions may not approve the manufacturing, marketing and promotion of the product candidate in other countries. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the U.S., including additional preclinical studies or clinical trials, as clinical trials conducted in one jurisdiction may not be accepted by regulatory authorities in other jurisdictions. In many jurisdictions outside the U.S., a product candidate must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we intend to charge for our products is also subject to approval.

We may also submit marketing applications in other countries. Regulatory authorities in jurisdictions outside of the U.S. have requirements for approval of product candidates with which we must comply prior to marketing in those jurisdictions. Receiving foreign regulatory approvals and compliance with foreign regulatory requirements could result

in significant delays, difficulties and costs for us and could delay or prevent the introduction of our products in certain countries. If we fail to comply with the regulatory requirements in international markets and/or 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.

Even if we receive regulatory approval of any product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense and we may be subject to penalties if we fail to comply with regulatory requirements or experience unanticipated problems with our product candidates.

If any of our product candidates are approved, they will be subject to ongoing regulatory requirements, including requirements related to manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, import, export, conduct of post-marketing studies and submission of safety, efficacy and other post-marketing information. In addition, we will be subject to continued compliance with cGMP and GCP requirements for any clinical trials that we conduct post-approval.

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

Any regulatory approvals that we receive for our product candidates may be subject to limitations on the approved uses for which the product may be marketed or contain requirements for potentially costly post-market testing, including Phase 4 clinical trials and surveillance to monitor the safety and efficacy of the product candidate. The FDA may also require a REMS program as a condition of approval of our product candidates, which could entail requirements for long-term patient follow-up, a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools.

Later discovery of previously unknown problems with our product candidates, 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 revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

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

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

We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the U.S. 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 face enforcement action and our business may be harmed.

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

The success of our product candidates, if approved, depends on the availability of coverage and adequate reimbursement from third-party payors. We cannot be sure that coverage and reimbursement will be available for, or accurately estimate the potential revenue from, our product candidates or assure that coverage and reimbursement will be available for any product that we may develop.

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

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

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

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

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

Moreover, increasing efforts by governmental and third-party payors in the U.S. and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our product candidates. There has been increasing legislative and enforcement interest in the U.S. with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. We expect to experience pricing pressures in connection with the sale of any of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations, cost containment initiatives and additional legislative changes. At the federal level, the Trump administration's budget for fiscal years 2019 and 2020 contain further drug price control measures that could be enacted during the budget process or in other future legislation sessions, 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. While any proposed measures will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. For example, on September 25, 2019, the Senate Finance Committee introduced the Prescription Drug Pricing Reduction Action of 2019, a bill intended to reduce Medicare and Medicaid prescription drug prices. The proposed legislation would restructure the Part D benefit, modify payment methodologies for certain drugs, and impose an inflation cap on drug price increases. An even more restrictive bill, the Lower Drug Costs Now Act of 2019, was introduced in the House of Representatives on September 19, 2019, and would require the HHS to directly negotiate drug prices with manufacturers. The Lower Drugs Costs Now Act of 2019 has passed through the House and was delivered to the Senate on December 16, 2019. However, it is unclear whether either of these bills will make it through both chambers and be signed into law, and if either is enacted, what effect it would have on our business. 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.

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

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

In the U.S., there have been and continue to be a number of legislative and regulatory changes and proposed changes to contain healthcare costs. For example, in March 2010, the Patient Protection and ACA, as amended by the Health Care and Education Reconciliation Act of 2010, collectively, the ACA, was passed, which has substantially changed the way health care is financed by both governmental and private insurers, and has significantly impacted the U.S. pharmaceutical industry. The ACA, among other things, subjects biological products to potential competition by lower cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations, establishes annual fees and taxes on manufacturers of certain branded prescription drugs, and creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 70% (as of January 1, 2019, pursuant to the Bipartisan Budget Act of 2018) point of sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

Certain provisions of the ACA have been subject to judicial challenges, as well as to efforts to repeal or replace them or to alter their interpretation or implementation. For example, the Tax Act, included a provision that repealed 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." Moreover, under the Trump Administration, CMS has issued regulations that give states great flexibility in the identification of the essential health benefits benchmarks for non-grandfathered individual and small group market health insurance coverage, including plans sold through the health insurance exchanges established under the ACA.

On December 14, 2018, the U.S. District Court for the Northern District of Texas, ruled that individual mandate is a critical and inseverable feature of the ACA, and because it was repealed as part of the Tax Act, the remaining provisions of the ACA are invalid as well. On December 18, 2019, the Fifth Circuit U.S. Court of Appeals held that the individual mandate is unconstitutional and remanded the case to the lower court to reconsider its earlier invalidation of the full ACA. Pending review, the ACA remains in effect, but it is unclear how the ultimate decision in this case, or other efforts to repeal, replace, or invalidate the ACA or its implementing regulations, or portions thereof, will impact our business. We will continue to evaluate the effect that the ACA and its possible repeal, replacement, or invalidation, in whole or in part, has on our business.

Other legislative changes have been proposed and adopted in the U.S. since the ACA was enacted. For example, on August 2, 2011, the Budget Control Act of 2011, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals for spending reductions. The Joint Selection Committee on Deficit Reduction did not achieve a targeted deficit reduction, which triggered the legislation's automatic reduction to several government programs. In concert with subsequent legislation, this includes aggregate reductions to Medicare payments to providers of, on average, 2% per fiscal year through 2029 unless Congress takes additional action. The American Taxpayer Relief Act of 2012 also reduced Medicare payments to several types of health care providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

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

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

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

Much like the federal Anti-Kickback Statute prohibition in the U.S., the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is also prohibited in the EU. The provision of benefits or advantages to physicians is governed by the national anti-inducement, advertising and anti-bribery laws of EU Member States. Infringement of these laws could result in substantial fines and imprisonment.

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

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

Failure to comply with health and data protection laws and regulations could lead to government enforcement actions (which could include civil or criminal penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business.

We and any potential collaborators may be subject to federal, state, and foreign data protection laws and regulations (i.e., laws and regulations that address privacy and data security). In the U.S., numerous federal and state laws and regulations, including federal health information privacy laws, state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), that govern the collection, use, disclosure and protection of health-related and other personal information could apply to our operations or the operations of our collaborators. In addition, we may obtain health information from third parties (including research institutions from which we obtain clinical trial data) that are subject to privacy and security requirements under HIPAA, as amended by HITECH. Depending on the facts and circumstances, we could be subject to civil, criminal, and administrative penalties if we knowingly obtain, use, or disclose individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA.

Compliance with U.S. and international data protection laws and regulations could require us to take on more onerous obligations in our contracts, restrict our ability to collect, use and disclose data, or in some cases, impact our ability to operate in certain jurisdictions. Failure to comply with these laws and regulations could result in government enforcement actions (which could include civil, criminal and administrative penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business. Moreover, clinical trial subjects, employees and other individuals about whom we or our potential collaborators obtain personal information, as well as the providers who share this information with us, may limit our ability to collect, use and disclose the information. Claims that we have violated individuals' privacy rights, failed to comply with data protection laws, or breached our contractual obligations, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business.

In the event we conduct clinical trial in the EEA, we may be subject to additional privacy laws. The General Data Protection Regulation, (EU) 2016/679 ("GDPR") became effective on May 25, 2018, and deals with the collection, use, storage, disclosure, transfer or other processing of personal data and on the free movement of such data. The GDPR imposes a broad range of strict requirements on companies subject to the GDPR, including requirements relating to having legal bases for processing personal information relating to identifiable individuals and transferring such information outside the EEA, including to the U.S., providing details to those individuals regarding the processing of their personal information, keeping personal information secure, having data processing agreements with third parties who process personal information, responding to individuals' requests to exercise their rights in respect of their personal information, reporting security breaches involving personal data to the competent national data protection authority and

affected individuals, appointing data protection officers, conducting data protection impact assessments, and record-keeping. The GDPR increases substantially the penalties to which we could be subject in the event of any non-compliance, including fines of up to 10,000,000 Euros or up to 2% of our total worldwide annual turnover for certain comparatively minor offenses, or up to 20,000,000 Euros or up to 4% of our total worldwide annual turnover for more serious offenses. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. In addition, the GDPR includes restrictions on cross-border data transfers.

The GDPR may increase our responsibility and liability in relation to personal data that we process where such processing is subject to the GDPR, and we may be required to put in place additional mechanisms to ensure compliance with the GDPR, including as implemented by individual countries. Given the new law, we face uncertainty as to the exact interpretation of the new requirements and we may be unsuccessful in implementing all measures required by data protection authorities or courts in interpretation of the new law. Compliance with the GDPR will be a rigorous and time-intensive process that may increase our cost of doing business or require us to change our business practices, and despite those efforts, there is a risk that we may be subject to fines and penalties, litigation, and reputational harm in connection with our European activities. Further, the United Kingdom's vote in favor of exiting the EU, often referred to as Brexit, has created uncertainty with regard to data protection regulation in the United Kingdom. In particular, it is unclear how data transfers to and from the United Kingdom will be regulated, nor is it clear when Brexit will occur.

EU Member States have adopted implementing national laws to implement the GDPR which may partially deviate from the GDPR and the competent authorities in the EU Member States may interpret GDPR obligations slightly differently from country to country, so that we do not expect to operate in a uniform legal landscape in the EU. Also, as it relates to processing and transfer of genetic data, the GDPR specifically allows national laws to impose additional and more specific requirements or restrictions, and European laws have historically differed quite substantially in this field, leading to additional uncertainty.

In the event we conduct clinical trials in the EEA, we must also ensure that we maintain adequate safeguards to enable the transfer of personal data outside of the EEA, in particular to the U.S., in compliance with European data protection laws. We expect that we will continue to face uncertainty as to whether our efforts to comply with our obligations under European privacy laws will be sufficient. If we are investigated by a European data protection authority, we may face fines and other penalties. Any such investigation or charges by European data protection authorities could have a negative effect on our existing business and on our ability to attract and retain new clients or pharmaceutical partners. We may also experience hesitancy, reluctance, or refusal by European or multi-national clients or pharmaceutical partners to continue to use our products and solutions due to the potential risk exposure as a result of the current (and, in particular, future) data protection obligations imposed on them by certain data protection authorities in interpretation of current law, including the GDPR. Such clients or pharmaceutical partners may also view any alternative approaches to compliance as being too costly, too burdensome, too legally uncertain, or otherwise objectionable and therefore decide not to do business with us. Any of the foregoing could materially harm our business, prospects, financial condition and results of operations.

In addition, California recently enacted the CCPA, which creates new individual privacy rights for California consumers (as defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. The CCPA will require covered companies to provide certain disclosures to consumers about its data collection, use and sharing practices, and to provide affected California residents with ways to opt-out of certain sales or transfers of personal information. The CCPA went into effect on January 1, 2020, and the California Attorney General will commence enforcement actions against violators beginning July 1, 2020. The California Attorney General has proposed draft regulations, which have not been finalized to date, that may further impact our business activities if they are adopted. The uncertainty surrounding the implementation of CCPA exemplifies the vulnerability of our business to the evolving regulatory environment related to personal data and protected health information.

Additional laws and regulations governing international operations could negatively impact or restrict our operations.

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

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

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

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

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations. We can face serious consequences for violations.

Among other matters, U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations, which are collectively referred to as Trade Laws, prohibit companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of Trade Laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We also expect our non-U.S. activities to increase in time. We plan to engage third parties for clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals and we can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities.

Risks Related to Our Intellectual Property

Our success depends in part on our ability to protect our intellectual property. It is difficult and costly to protect our proprietary rights and technology, and we may not be able to ensure their protection.

Our commercial success will depend in large part on obtaining and maintaining patent, trademark and trade secret protection of our proprietary technologies and our product candidates, their respective components, formulations, combination therapies, methods used to manufacture them and methods of treatment, as well as successfully defending these patents against third-party challenges. Our ability to stop unauthorized third parties from making, using, selling, offering to sell or importing our product candidates is dependent upon the extent to which we have rights under valid and enforceable patents that cover these activities. If we are unable to secure and maintain patent protection for any product or technology we develop, or if the scope of the patent protection secured is not sufficiently broad, our competitors could

develop and commercialize products and technology similar or identical to ours, and our ability to commercialize any product candidates we may develop may be adversely affected.

The patenting process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. In addition, we may not pursue or obtain patent protection in all relevant markets. 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. Moreover, in some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology that we license from or license to third parties and are reliant on our licensors or licensees.

The strength of patents in the biotechnology and pharmaceutical field involves complex legal and scientific questions and can be uncertain. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our product candidates or uses thereof in the U.S. and/or in other foreign countries. Even if the patents do successfully issue, third parties may challenge the validity, enforceability or scope thereof, which may result in such patents being narrowed, invalidated or held unenforceable. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property and/or prevent others from designing around our claims. If the breadth or strength of protection provided by the patent applications we hold with respect to our product candidates is threatened, it could dissuade companies from collaborating with us to develop, and threaten our ability to commercialize, our product candidates. Further, if we encounter delays in our clinical trials, the period of time during which we could market our product candidates under patent protection would be reduced.

Since patent applications in the U.S. and most other countries are confidential for a period of time after filing, we cannot be certain that we were the first to file any patent application related to our product candidates. Furthermore, for U.S. applications in which all claims are entitled to a priority date before March 16, 2013, an interference proceeding can be provoked by a third-party or instituted by the U.S. patent office, the "USPTO", to determine who was the first to invent any of the subject matter covered by the patent claims of our applications.

We cannot be certain that we are the first to invent the inventions covered by pending patent applications and, if we are not, we may be subject to priority disputes. We may be required to disclaim part or all of the term of certain patents or all of the term of certain patent applications. There may be prior art of which we are not aware that may affect the validity or enforceability of a patent claim. There also may be prior art of which we are aware, but which we do not believe affects the validity or enforceability of a claim, which may, nonetheless, ultimately be found to affect the validity or enforceability of a claim. No assurance can be given that if challenged, our patents would be declared by a court to be valid or enforceable or that even if found valid and enforceable, a competitor's technology or product would be found by a court to infringe our patents. We may analyze patents or patent applications of our competitors that we believe are relevant to our activities, and consider that we are free to operate in relation to our product candidates, but our competitors may achieve issued claims, including in patents we consider to be unrelated, which block our efforts or may potentially result in our product candidates or our activities infringing such claims. The possibility exists that others will develop products which have the same effect as our products on an independent basis which do not infringe our patents or other intellectual property rights, or will design around the claims of patents that we have had issued that cover our products.

Recent or future patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. Under the enacted Leahy-Smith America Invents Act (the "America Invents Act"), enacted in 2013, the U.S. moved from a "first to invent" to a "first to file" system. Under a "first to file" system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to a patent on the invention regardless of whether another inventor had made the invention earlier. The America Invents Act includes a number of other significant changes to U.S. patent law, including provisions that affect the way patent applications are prosecuted, redefine prior art and establish a new post-grant review system. The effects of these changes are currently unclear as the USPTO only recently developed new regulations and procedures in connection with the America Invents Act, and many of the substantive changes to patent law, including the "first to file" provisions, only became effective in March 2013. In addition, the courts have yet to address many of these provisions and the applicability of the act and new regulations on specific patents discussed herein have not been determined and would need to be reviewed. However, the America Invents Act and its implementation

could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business and financial condition.

The degree of future protection for our proprietary rights is uncertain because legal means afford only limited protection and may not adequately protect our rights or permit us to gain or keep our competitive advantage. For example:

- others may be able to make or use compounds or cells that are similar to the biological compositions of our product candidates but that are not covered by the claims of our patents;
- the active biological ingredients in our current product candidates will eventually become commercially available in biosimilar drug products, and no patent protection may be available with regard to formulation or method of use;
- we or our licensors, as the case may be, may fail to meet our obligations to the U.S. government in regards to any in-licensed patents and patent applications funded by U.S. government grants, leading to the loss of patent rights;
- we or our licensors, as the case may be, might not have been the first to file patent applications for these inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies;
- it is possible that our pending patent applications will not result in issued patents;
- it is possible that there are prior public disclosures that could invalidate our or our licensors' patents, as the case may be, or parts of our or their patents;
- it is possible that others may circumvent our owned or in-licensed patents;
- it is possible that there are unpublished applications or patent applications maintained in secrecy that may later issue with claims covering our products or technology similar to ours;
- the laws of foreign countries may not protect our or our licensors', as the case may be, proprietary rights to the same extent as the laws of the U.S.;
- the claims of our owned or in-licensed issued patents or patent applications, if and when issued, may not cover our product candidates;
- our owned or in-licensed issued patents may not provide us with any competitive advantages, may be narrowed in scope, or be held invalid or unenforceable as a result of legal challenges by third parties;
- the inventors of our owned or in-licensed patents or patent applications may become involved with competitors, develop products or processes which design around our patents, or become hostile to us or the patents or patent applications on which they are named as inventors;
- it is possible that our owned or in-licensed patents or patent applications omit individual(s) that should be listed as inventor(s) or include individual(s) that should not be listed as inventor(s), which may cause these patents or patents issuing from these patent applications to be held invalid or unenforceable;
- we have engaged in scientific collaborations in the past, and will continue to do so in the future. Such collaborators may develop adjacent or competing products to ours that are outside the scope of our patents;
- we may not develop additional proprietary technologies for which we can obtain patent protection;

- it is possible that product candidates or diagnostic tests we develop may be covered by third parties' patents or other exclusive rights; and/or

- the patents of others may have an adverse effect on our business.

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

We are dependent on patents, know-how and proprietary technology, both our own and licensed from others. Any termination of these licenses could result in the loss of significant rights and could harm our ability to commercialize our product candidates.

Disputes may also arise between us and our licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation related issues;

- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;

- our right to sublicense patent and other rights to third parties under collaborative development relationships;

- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates, and what activities satisfy those diligence obligations; and

- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

We are generally also subject to all of the same risks with respect to protection of intellectual property that we license, as we are for intellectual property that we own, which are described below. If we or our licensors fail to adequately protect this intellectual property, our ability to commercialize products could suffer.

If we fail to comply with our obligations under our patent licenses with third parties, we could lose license rights that are important to our business.

We may be a party to license agreements pursuant to which we in-license key patents and patent applications for our product candidates. These existing licenses impose various diligence, milestone payment, royalty, insurance and other obligations on us. If we fail to comply with these obligations, our licensors may have the right to terminate the license, in which event we would not be able to develop or market the products covered by such licensed intellectual property.

We may have limited control over the maintenance and prosecution of these in-licensed patents and patent applications, activities or any other intellectual property that may be related to our in-licensed intellectual property. For example, we cannot be certain that such activities by these licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents and other intellectual property rights. We have limited control over the manner in which our licensors initiate an infringement proceeding against a third-party infringer of the intellectual property rights, or defend certain of the intellectual property that is licensed to us. It is possible that the licensors' infringement proceeding or defense activities may be less vigorous than had we conducted them ourselves.

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

In addition to patent protection, we rely heavily upon know-how and trade secret protection, as well as non-disclosure agreements and invention assignment agreements with our employees, consultants and third parties, to protect our confidential and proprietary information, especially where we do not believe patent protection is appropriate or obtainable. In addition to contractual measures, we try to protect the confidential nature of our proprietary information using physical and technological security measures. Such measures may not, for example, in the case of misappropriation of a trade secret by an employee or third-party with authorized access, provide adequate protection for our proprietary information. Our security measures may not prevent an employee or consultant from misappropriating our trade secrets and providing them to a competitor, and recourse we take against such misconduct may not provide an adequate remedy to protect our interests fully. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret can be difficult, expensive, and time-consuming, and the outcome is unpredictable. In addition, trade secrets may be independently developed by others in a manner that could prevent legal recourse by us. If any of our confidential or proprietary information, such as our trade secrets, were to be disclosed or misappropriated, or if any such information was independently developed by a competitor, our competitive position could be harmed.

In addition, courts outside the U.S. are sometimes less willing to protect trade secrets. If we choose to go to court to stop a third-party from using any of our trade secrets, we may incur substantial costs. These lawsuits may consume our time and other resources even if we are successful. Although we take steps to protect our proprietary information and 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 or entity during the course of the party'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 addition, we take other appropriate precautions, such as physical and technological security measures, to guard against misappropriation of our proprietary technology by third parties. We have also adopted policies and conduct training that provides guidance on our expectations, and our advice for best practices, in protecting our trade secrets.

Third-party claims of intellectual property infringement may prevent or delay our product discovery and development efforts.

Our commercial success depends in part on our ability to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. There is a substantial amount of litigation involving patents and other intellectual property rights in the biotechnology and pharmaceutical industries, as well as administrative proceedings for challenging patents, including interference, derivation, *inter partes* review, post-grant review, and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. We may be exposed to, or threatened with, future litigation by third parties having patent or other intellectual property rights alleging that our product candidates and/or proprietary technologies infringe their intellectual property rights. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing our product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may give rise to claims of infringement of the patent rights of others. Moreover, it is not always clear to industry participants, including us, which patents cover various types of drugs, products or their methods of use or manufacture. Thus, because of the large number of patents issued and patent applications filed in our fields, there may be a risk that third parties may allege they have patent rights encompassing our product candidates, technologies or methods.

If a third-party claims that we infringe its intellectual property rights, we may face a number of issues, including, but not limited to:

- infringement and other intellectual property claims which, regardless of merit, may be expensive and time-consuming to litigate and may divert our management's attention from our core business;
- substantial damages for infringement, which we may have to pay if a court decides that the product candidate or technology at issue infringes on or violates the third-party's rights, and, if the court finds that the infringement was willful, we could be ordered to pay treble damages and the patent owner's attorneys' fees;
- a court prohibiting us from developing, manufacturing, marketing or selling our product candidates, or from using our proprietary technologies, unless the third-party licenses its product rights to us, which it is not required to do;
- if a license is available from a third-party, we may have to pay substantial royalties, upfront fees and other amounts, and/or grant cross-licenses to intellectual property rights for our products; and
- redesigning our product candidates or processes so they do not infringe, which may not be possible or may require substantial monetary expenditures and time.

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. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise the funds necessary to continue our operations or could otherwise have a material adverse effect on our business, results of operations, financial condition and prospects.

Third parties may assert that we are employing their proprietary technology without authorization. Generally, conducting clinical trials and other development activities in the U.S. is protected under the Safe Harbor exemption as set forth in 35 U.S.C. § 271. If and when SRK-015, SRK-181 or another one of our product candidates is approved by the FDA, that certain third-party may then seek to enforce its patent by filing a patent infringement lawsuit against us. While we do not believe that any claims of such patent that could otherwise materially adversely affect commercialization of our product candidates, if approved, are valid and enforceable, we may be incorrect in this belief, or we may not be able to prove it in a litigation. In this regard, patents issued in the U.S. by law enjoy a presumption of validity that can be rebutted only with evidence that is "clear and convincing," a heightened standard of proof. There may be third-party patents of which we are currently unaware with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of our product candidates, constructs or molecules used in or formed during the manufacturing process, or any final product itself, the holders of any such patents may be able to block our ability to commercialize the product candidate unless we obtained a license under the applicable patents, or until such patents expire or they are finally determined to be held invalid or unenforceable. Similarly, if any third-party patent were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, the holders of any such patent may be able to block our ability to develop and commercialize the product candidate unless we obtained a license or until such patent expires or is finally determined to be held invalid or unenforceable. In either case, such a license may not be available on commercially reasonable terms, or at all. If we are unable to obtain a necessary license to a third-party patent on commercially reasonable terms, or at all, our ability to commercialize our product candidates may be impaired or delayed, which could in turn significantly harm our business. Even if we obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

Parties making claims against us may seek and obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, and/or pay royalties or redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. We cannot predict whether any such license would be available at all or whether it would be available on commercially reasonable terms. Furthermore, even in the absence of litigation, we may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize our product candidates, which could harm our business significantly.

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

As is common in the biotechnology and pharmaceutical industries, we employ individuals who were previously employed at universities or other biopharmaceutical or pharmaceutical companies, including our competitors or potential competitors. Although no claims against us are currently pending, and although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of a former employer or other third parties. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments, and, if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. This type of litigation or proceeding could substantially increase our operating losses and reduce our resources available for development 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 substantially greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other intellectual property related proceedings could adversely affect our ability to compete in the marketplace.

We may not be successful in obtaining or maintaining necessary rights to develop any future product candidates on acceptable terms.

Because our programs may involve additional product candidates that may require the use of proprietary rights held by third parties, the growth of our business may depend in part on our ability to acquire, in-license or use these proprietary rights.

Our product candidates may also require specific formulations to work effectively and efficiently, and these rights may be held by others. We may develop products containing our compounds and pre-existing pharmaceutical compounds. We may be required by the FDA or comparable foreign regulatory authorities to provide a companion diagnostic test or tests with our product candidates. These diagnostic test or tests may be covered by intellectual property rights held by others. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary or important to our business operations. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all, which would harm our business. We may need to cease use of the compositions or methods covered by such third-party intellectual property rights, and may need to seek to develop alternative approaches that do not infringe on such intellectual property rights which may entail additional costs and development delays, even if we were able to develop such alternatives, which may not be feasible. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to

the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology.

Additionally, we sometimes collaborate with academic institutions to accelerate our preclinical research or development under written agreements with these institutions. In certain cases, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such option, we may be unable to negotiate a license within the specified timeframe or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to others, potentially blocking our ability to pursue our program. If we are unable to successfully obtain rights to required third-party intellectual property or to maintain the existing intellectual property rights we have, we may have to abandon development of such program and our business and financial condition could suffer.

The licensing or acquisition of third-party intellectual property rights is a competitive area, and companies, which may be more established, or have greater resources than we do, may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive in order to commercialize our product candidates. More established companies may have a competitive advantage over us due to their size, cash resources and greater clinical development and commercialization capabilities. There can be no assurance that we will be able to successfully complete such negotiations and ultimately acquire the rights to the intellectual property surrounding the additional product candidates that we may seek to acquire.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents or the patents of our licensors. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that one or more of our patents is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, held unenforceable, or interpreted narrowly and could put our patent applications at risk of not issuing. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business.

We may choose to challenge the patentability of claims in a third-party's U.S. patent by requesting that the USPTO review the patent claims in an *ex-parte* re-exam, *inter partes* review or post-grant review proceedings. These proceedings are expensive and may consume our time or other resources. We may choose to challenge the grant of a third-party's patent in opposition proceedings in the EPO or other foreign patent office. The costs of these opposition proceedings could be substantial, and may consume our time or other resources. If we fail to obtain a favorable result at the USPTO, EPO or other patent office, then we may be exposed to litigation by a third-party alleging that the patent may be infringed by our product candidates or proprietary technologies.

In addition, because some patent applications in the U.S. may be maintained in secrecy until the patents are issued, because patent applications in PCT member jurisdictions are typically not published until 18 months after the earliest filing, and because publications in the scientific literature often lag behind actual discoveries, we cannot be certain that others have not filed patent applications for technology covered by our owned and in-licensed issued patents or our pending applications, or that we or, if applicable, a licensor were the first to invent the technology. Our competitors may have filed, and may in the future file, patent applications covering our products, compositions, methods of use, or technology similar to ours. Any such patent application may have priority over our owned and in-licensed patent applications or patents, which could require us to obtain rights to issued patents covering such technologies. If another party has filed a U.S. patent application on inventions similar to those owned by or in-licensed to us, we or, in the case of in-licensed technology, the licensor may have to participate in an interference proceeding declared by the USPTO to determine priority of invention in the U.S. If we or one of our licensors is a party to an interference proceeding involving a U.S. patent application on inventions owned by or in-licensed to us, we may incur substantial costs, divert management's time and expend other resources, even if we are successful.

For applications filed under pre-AIA, interference proceedings declared by the USPTO may be necessary to determine the priority of inventions with respect to our patents or patent applications or those of our licensors. An unfavorable outcome could result in a loss of our current patent rights and 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. Litigation or interference proceedings may result in a decision adverse to our interests and, even if we are successful, may result in substantial costs and distract our management and other employees. We may not be able to prevent, alone or with our licensors, misappropriation of our trade secrets or confidential information, particularly in countries where the laws may not protect those rights as fully as in the U.S.

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. 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.

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

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

Issued patents covering our product candidates could be found invalid or unenforceable if challenged in court or the USPTO.

If we or one of our licensing partners initiate legal proceedings against a third-party to enforce a patent covering one of our product candidates, the defendant could counterclaim that the patent covering our product candidate, as applicable, is invalid and/or unenforceable. In patent litigation in the U.S., defendant counterclaims alleging invalidity and/or unenforceability are commonplace, and there are numerous grounds upon which a third-party can assert invalidity or unenforceability of a patent. Third parties may also raise similar claims before administrative bodies in the U.S. or abroad, even outside the context of litigation. Such mechanisms include re-examination, post-grant review, and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in revocation or amendment to our patents in such a way that they no longer cover our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we, our patent counsel and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, or if we are otherwise unable to adequately protect our rights, we would lose at least part, and perhaps all, of the patent protection on our product candidates. Such a loss of patent protection could have a material adverse impact on our business and our ability to commercialize or license our technology and product candidates.

Likewise, our current owned patents covering our proprietary technologies and our product candidates are expected to expire beginning in 2034, without taking into account any possible patent term adjustments or extensions. Our earliest patents may expire before, or soon after, our first product achieves marketing approval in the U.S. or foreign jurisdictions. Upon the expiration of our current patents, we may lose the right to exclude others from practicing these inventions. The expiration of these patents could also have a similar material adverse effect on our business, results of operations, financial condition and prospects. We own pending patent applications covering our proprietary technologies

or our product candidates that if issued as patents are expected to expire from 2034 through 2041, without taking into account any possible patent term adjustments or extensions. However, we cannot be assured that the USPTO or relevant foreign patent offices will grant any of these patent applications.

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

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the U.S. has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. For example, in the case *Amgen Inc. v. Sanofi*, the Federal Circuit held that a well characterized antigen is insufficient to satisfy the written description requirement of certain claims directed to a genus of antibodies that are solely defined by function. While the validity of a subset of patents at issue was subsequently upheld by a district court jury, uncertainty remains as to the legal question pertaining to the written description requirement under 35 USC §112 as it relates to functional antibodies. In the case of *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, the U.S. Supreme Court held that certain claims to DNA molecules are not patentable. We cannot predict how these decisions or any future decisions by the courts, the U.S. Congress or the USPTO may impact the value of our patents. Similarly, any adverse changes in the patent laws of other jurisdictions could have a material adverse effect on our business and financial condition.

We have limited foreign intellectual property rights and may not be able to protect our intellectual property rights throughout the world.

We have limited intellectual property rights outside the U.S. Filing, prosecuting and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the U.S. can be less extensive than those in the U.S. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the U.S. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., or from selling or importing products made using our inventions in and into the U.S. or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection but where enforcement is not as strong as that in the U.S. These products may compete with our products in jurisdictions where we do not have any issued patents and our patent claims or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biopharmaceutical products and/or methods of medical treatment, which could make it difficult for us to stop the infringement of our patents or marketing of competing products against third parties in violation of our proprietary rights generally. The initiation of proceedings by third parties to challenge the scope or validity of our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

We may incur substantial costs as a result of litigation or other proceedings relating to patents, and we may be unable to protect our rights to our products and technology.

If we or our licensors choose to go to court to stop a third-party from using the inventions claimed in our owned or in-licensed patents, that third-party may ask the court to rule that the patents are invalid and/or should not be enforced against that third-party. These lawsuits are expensive and would consume time and other resources even if we or they, as the case may be, were successful in stopping the infringement of these patents. In addition, there is a risk that the court will decide that these patents are not valid and that we or they, as the case may be, do not have the right to stop others from using the inventions.

There is also the risk that, even if the validity of these patents is upheld, the court will refuse to stop the third-party on the ground that such third-party's activities do not infringe our owned or in-licensed patents. In addition, the U.S. Supreme Court has recently changed some legal principles that affect patent applications, granted patents and assessment of the eligibility or validity of these patents. As a consequence, issued patents may be found to contain invalid claims according to the newly revised eligibility and validity standards. Some of our owned or in-licensed patents may be subject to challenge and subsequent invalidation or significant narrowing of claim scope in proceedings before the USPTO, or during litigation, under the revised criteria which could also make it more difficult to obtain patents.

We, or our licensors, may not be able to detect infringement against our owned or in-licensed patents, as the case may be, which may be especially difficult for manufacturing processes or formulation patents. Even if we or our licensors detect infringement by a third-party of our owned or in-licensed patents, we or our licensors, as the case may be, may choose not to pursue litigation against or settlement with the third-party. If we, or our licensors, later sue such third-party for patent infringement, the third-party may have certain legal defenses available to it, which otherwise would not be available except for the delay between when the infringement was first detected and when the suit was brought. Such legal defenses may make it impossible for us or our licensors to enforce our owned or in-licensed patents, as the case may be, against such third-party.

If another party questions the patentability of any of our claims in our owned or in-licensed U.S. patents, the third-party can request that the USPTO review the patent claims such as in an *inter partes* review, *ex parte* re-exam or post-grant review proceedings. These proceedings are expensive and may result in a loss of scope of some claims or a loss of the entire patent. In addition to potential USPTO review proceedings, we may become a party to patent opposition proceedings at the EPO or similar proceedings in other foreign patent offices, where either our owned or in-licensed foreign patents are challenged. This may prevent us from asserting this patent against our competitors marketing otherwise infringing products in relevant European or foreign countries where this patent has been granted.

In the future, we may be involved in similar proceedings challenging the patent rights of others, and the outcome of such proceedings is highly uncertain. An adverse determination in any such proceeding could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. The costs of these opposition or similar proceedings could be substantial, and may result in a loss of scope of some claims or a loss of the entire patent. An unfavorable result at the USPTO, EPO or other patent office may result in the loss of our right to exclude others from practicing one or more of our inventions in the relevant country or jurisdiction, which could have a material adverse effect on our business.

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

Patents have a limited lifespan. In the U.S., if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions such as patent term adjustments and/or 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 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.

If we do not obtain patent term extension and data exclusivity for any product candidates we may develop, our business may be materially harmed.

Depending upon the timing, duration and specifics of any FDA marketing approval of any product candidates we may develop, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Action of 1984, also known as the Hatch Waxman Amendments. The Hatch Waxman Amendments permit a patent extension term of up to five years as compensation for patent term lost during the FDA regulatory review process. The patent term restoration period is generally one-half of the time between the effective date of the IND or the date of patent grant (whichever is later) and the date of submission of the BLA, plus the time between the date of submission of the BLA and the date of FDA approval of the product. The patent holder must apply for restoration within 60 days of approval. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, only one patent may be extended and only those claims covering the approved drug, a method for using it, or a method for manufacturing it may be extended. We may not be granted an extension because of, for example, failing to exercise due diligence during the testing phase or regulatory review process, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents, or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our business, financial condition, results of operations, and prospects could be materially harmed.

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 and our business may be adversely affected.

Risks Related to Our Reliance On Third Parties

We rely on third parties to conduct certain aspects of our preclinical studies and to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines or comply with legal and regulatory requirements, we may be delayed or unable to receive regulatory approval of or commercialize any potential product candidates, and our business could be materially harmed.

We depend upon third parties to conduct certain aspects of our preclinical studies and to conduct our clinical trials, under agreements with universities, medical institutions, CROs, strategic partners and others. We often have to negotiate budgets and contracts with such third parties, and if we are unsuccessful or if the negotiations take longer than anticipated, this could result in delays to our development timelines and increased costs.

We rely especially heavily on third parties over the course of our clinical trials, and, as a result, have limited control over the clinical investigators and limited visibility into their day-to-day activities, including with respect to their compliance with the approved clinical protocol. Nevertheless, we are responsible for ensuring that each of our trials is conducted in accordance with the applicable protocol, legal and regulatory requirements and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. We and these third parties are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for product candidates in clinical development. Regulatory authorities enforce these GCP requirements through periodic inspections of trial sponsors, clinical investigators and trial sites. If we or any of these third parties fail to comply with applicable GCP requirements, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to suspend or terminate these trials or perform

additional preclinical studies or clinical trials before approving our marketing applications. We cannot be certain that, upon inspection, such regulatory authorities will determine that any of our clinical trials comply with the GCP requirements.

Our failure or any failure by these third parties to comply with these regulations or to recruit a sufficient number of patients may require us to repeat clinical trials, which would delay the regulatory approval process. Moreover, our business may be implicated if any of these third parties violate federal or state fraud and abuse or false claims laws and regulations or healthcare privacy and security laws.

Any third parties conducting aspects of our preclinical studies or clinical trials will not be our employees and, except for remedies that may be available to us under our agreements with such third parties, we cannot control whether they devote sufficient time and resources to our preclinical studies and clinical trials. These third parties may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other product development activities, which could affect their performance on our behalf. If these third parties do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the preclinical or clinical data they obtain is compromised due to the failure to adhere to our protocols or regulatory requirements or for other reasons, our development timelines, including clinical development timelines, may be extended, delayed or terminated and we may not be able to complete development of, receive regulatory approval of or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for our product candidates would be harmed, our costs could increase and our ability to generate revenue could be delayed.

If any of our relationships with these third-party CROs or others terminate, we may not be able to enter into arrangements with alternative CROs or other third parties or to do so on commercially reasonable terms. Switching or adding additional CROs involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new CRO begins work. As a result, delays may occur, which can materially impact our ability to meet our desired development timelines. Though we carefully manage our relationships with our CROs, there can be no assurance that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

Because we rely on third-party manufacturing and supply partners, our supply of research and development, preclinical and clinical development materials may become limited or interrupted or may not be of satisfactory quantity or quality.

We rely on third-party contract manufacturers to manufacture some of our preclinical product candidate supplies and rely on third-party contract manufacturers to manufacture all of our clinical trial product supplies, including all of our drug substance, vialing, labeling, and packaging. We do not own manufacturing facilities for producing any clinical trial product supplies. There can be no assurance that our preclinical and clinical development product supplies will not be limited or interrupted, or that our product supplies will be 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; this could be particularly problematic where we rely on a single source supplier, as is currently the case for the manufacture of SRK-015 and SRK-181.

The manufacturing process for a product candidate is subject to FDA and foreign regulatory authority review. 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. In the event that any of our manufacturers fails to comply with such requirements or to perform its obligations to us 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, for which we currently do not have the capabilities or resources, 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 transferring such skills or technology to another third-party and a feasible alternative may not exist. These factors would increase our reliance on the original manufacturer or require us to obtain a license from such manufacturer in order to have another third-party

manufacture our product candidates. If we must 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. 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 SRK-015, SRK-181 or any future product candidate. To the extent that we have existing, or in the future enter into, 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 cGMP 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.

In addition, we contract with fill and finishing providers which we believe have the appropriate expertise, facilities and scale to meet our needs. Failure to maintain compliance with cGMP can result in a contractor receiving FDA sanctions, which can impact our ability to operate or lead to delays in any clinical development programs. We believe that our current fill and finish contractor is operating in accordance with cGMP, but we can give no assurance that the FDA, EMA or other regulatory agencies will not conclude that a lack of compliance exists. In addition, any delay in contracting for fill and finish services, or failure of the contract manufacturer to perform the services as needed, may delay any clinical trials, registration and launches, which could negatively affect our business.

Our reliance on third parties, such as manufacturers and antibody discovery vendors, may subject us to risks relating to manufacturing scale-up and may cause us to undertake substantial obligations, including financial obligations.

In order to continue to conduct later-stage clinical trials with SRK-015, SRK-181 or any of our future product candidates, we will need to manufacture such product candidate 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 received, which could significantly harm our business.

In addition, we rely, and intend to continue to rely, on third-party entities to conduct antibody discovery based on criteria and specifications provided by us. Certain of our antibody discovery vendors may require us to enter into a license agreement with them or exercise an option in an existing agreement with them for the right to use antibodies discovered by them in humans or for commercial purposes. Such license or other agreements could include substantial milestone payments and royalties to the extent we choose to use an antibody discovered by such vendors. For example, under our

Adimab Agreement, upon exercise of the development and option for the research program from which SRK-181 was generated, we paid to Adimab a non-creditable, nonrefundable option exercise fee; and on a Product (as defined in the Adimab Agreement)-by-Product basis, we will pay Adimab upon the achievement of various clinical and regulatory milestone events with total milestone payments not to exceed mid-teen millions in the aggregate for a given Product; for any Product that is commercialized, on a country-by-country and Product-by-Product basis, we are obligated to pay to Adimab a low-to-mid single-digit percentage of annual worldwide net sales of such Product during the applicable royalty period in each country. In addition, if we do not meet our obligations under such license or other agreements, the counterparties may have the ability to terminate the license or other agreements and we could lose the right to use the discovered antibodies, which could significantly and adversely impact our business.

The failure to maintain the Gilead Collaboration Agreement, or the failure of Gilead to perform its obligations under or our failure to achieve certain milestones under the Gilead Collaboration Agreement could negatively impact our business, financial condition, results of operations and prospects.

On December 19, 2018, we entered into the Gilead Collaboration Agreement, to discover and develop specific inhibitors of TGFβ activation focused on the treatment of fibrotic diseases. Under the collaboration, Gilead has exclusive options to license worldwide rights to product candidates that emerge from three of our TGFβ programs (each a "Gilead Program"). Pursuant to the Gilead Collaboration Agreement, we are responsible for antibody discovery and preclinical research through product candidate nomination, after which, upon exercising the option for a Gilead Program, Gilead will be responsible for the Gilead Program's preclinical and clinical development and commercialization. In consideration of the foregoing, we received $80 million in upfront payments, comprised of $50 million in cash and a $30 million equity investment in us. In addition, in January 2020, we received a one-time milestone payment of $25 million for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies and will be eligible to receive up to an additional $1,425 million in potential payments aggregated across all three Gilead Programs, based on the successful achievement of certain research, development, regulatory and commercialization milestones. We would also receive high single-digit to low double-digit tiered royalties on sales of potential future products originating from the collaboration. We cannot guarantee the outcome of our efforts to achieve such milestones, and, even if we achieve such milestones, we cannot directly control Gilead's performance of its obligations under the agreement or the amount and timing of resources that Gilead will dedicate to these efforts, and accordingly, we may not receive any additional milestone or royalty payments that are contingent upon our or Gilead's achievements.

We are subject to a number of other risks associated with our collaboration with Gilead, including:

- If we are able to identify program antibodies and present Gilead with development candidate nominations, Gilead may not exercise its option to such program or we and Gilead could disagree as to future development plans, and Gilead may delay, fail to commence, or stop future preclinical and clinical development and commercialization.

- If Gilead exercised one or more options, following such exercise, Gilead will have sole responsibility for the development and commercialization of the product candidates from such program in the applicable field. Gilead will have the sole discretion to determine and direct its efforts and resources, including the ability to discontinue all efforts and resources it applies to the development and, if approval is received, commercialization and marketing of the product candidates covered by the applicable program. Gilead may not be effective in receiving approvals for the product candidates developed from the programs or in marketing, or arranging for necessary supply, manufacturing or distribution relationships for, any approved products. Furthermore, Gilead may change its strategic focus or pursue alternative technologies in a manner that results in reduced, delayed or no revenue to us. Gilead has a variety of marketed products and product candidates under collaboration with other companies, including some of our competitors, and its own corporate objectives may not be consistent with our best interests. If Gilead fails to develop, receive regulatory approval for or ultimately commercialize any product candidate from the programs covered by the Gilead Collaboration Agreement, or if Gilead terminates our collaboration, our business, financial condition, results of operations and prospects would be harmed.

- There may be disputes between Gilead and us, including disagreements regarding the Gilead Collaboration Agreement, that may result in the delay of development programs, creation of uncertainty as to ownership of, control of, or access to intellectual property rights, litigation or arbitration proceedings, distraction of our management from other business activities, and our incurrence of substantial expenses. Any disagreements could result in failure to achieve developmental, regulatory and sales objectives that would have otherwise resulted in milestone or royalty payments to us or the delay or termination of any future development or commercialization of a Gilead Program.

The Gilead Collaboration Agreement is also subject to early termination, including through Gilead's right under certain circumstances to terminate upon advance notice to us. If the Gilead Collaboration Agreement is terminated early, we may not be able to find another collaborator for the further development and commercialization of the three Gilead Programs covered by the Gilead Collaboration Agreement on acceptable terms, or at all, and we may be unable to pursue continued development and commercialization of such programs on our own.

We may not be successful in our efforts to discover antibodies or identify potential product candidates under the Gilead Collaboration Agreement.

A key element of our strategy under the Gilead Collaboration Agreement is to use our proprietary technology to identify program antibodies that meet the development criteria for such Gilead Program. Our antibody discovery process may not be successful in identifying antibodies that meet the development criteria for a Gilead Program under the Gilead Collaboration Agreement or that we believe qualify as product candidates. Even if we identify and nominate a product candidate for any Gilead Program, Gilead may not choose to exercise its option for the Gilead Program or may not be successful in developing or commercializing such product candidate. If Gilead elected not to exercise an option, we would have incurred significant discovery and research expenses but may not be eligible to receive future milestone or royalty payments related to such program. Further development of a product candidate may also be discontinued by Gilead if the product candidate is shown to have harmful side effects or if other characteristics are observed that indicate the product candidate may be unlikely to receive marking approval or achieve market acceptance. If Gilead decides not to move forward with a product candidate, that could negatively affect our business, including our reputation, and could hinder our ability to enter into future collaborations.

We may seek to enter into collaborations in the future with other third parties, including for SRK-015, SRK-181 or potential product candidates. If we are unable to enter into such collaborations, or if these collaborations are not successful, our business could be adversely affected.

A part of our strategy is to evaluate and, as deemed appropriate, enter into additional collaborations or partnerships in the future when strategically attractive, including potentially with major biotechnology or pharmaceutical companies. We have limited capabilities for product development and do not yet have any capability for commercialization. Accordingly, we may enter into collaborations with other companies to provide us with important technologies, capabilities and funding for our programs and underlying technology.

Any future collaborations we enter into may pose a number of risks, including the following:

- collaborators may have significant discretion or decision-making authority in determining the efforts and resources that they will apply to the collaboration or that we are required to apply to the collaboration;

- collaborators may not perform their obligations as expected or in a manner satisfactory to us;

- we may commit to certain preclinical or clinical development or commercialization efforts as part of the collaboration that we are unable to meet or our collaborators may not be satisfied with our preclinical or clinical development or commercialization efforts;

- collaborators may not pursue development and commercialization of any product candidates that achieve regulatory approval or may elect not to continue or renew development or commercialization programs or license arrangements based on clinical trial results, changes in the collaborators' strategic focus or available

funding, or external factors, such as a strategic transaction that may divert resources or create 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 products and product candidates if the collaborators believe that the competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;

- product candidates discovered in collaboration with us may be viewed by our collaborators as competitive with their own product candidates or products, which may cause collaborators to cease to devote resources to the commercialization of our product candidates;

- collaborators may fail to comply with applicable regulatory requirements regarding the development, manufacture, distribution or marketing of a product candidate or product;

- collaborators with marketing and distribution rights to one or more of our product candidates that achieve regulatory approval may not commit sufficient resources to the marketing and distribution of such product or products;

- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the preferred course of development, might cause delays or terminations of the research, development or commercialization of product candidates, might lead to additional responsibilities for us with respect to product candidates, or might result in litigation or arbitration, any of which would be time-consuming and expensive;

- 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 potential litigation;

- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;

- if a collaborator of ours is involved in a business combination, the collaborator might deemphasize or terminate the development or commercialization of any product candidate licensed to it by us; and

- collaborations may be terminated by the collaborator, and, if terminated, we could be required to raise additional capital to pursue further development or commercialization of the applicable product candidates.

If our collaborations do not result in the successful discovery, development and commercialization of product candidates or if one of our collaborators terminates its agreement with us, we may not receive any future research funding or milestone or royalty payments under such collaboration. All of the risks relating to product development, regulatory approval and commercialization described in this Annual Report on Form 10-K also apply to the activities of our therapeutic collaborators.

Additionally, if one of our collaborators terminates its agreement with us, we may find it more difficult to attract new collaborators and our perception in the biotechnology or pharmaceutical industry, including within the business and financial communities, could be adversely affected.

We face significant competition in seeking appropriate partners for our product candidates, and the negotiation process is time-consuming and complex. In order for us to successfully partner our product candidates, potential partners must view these product candidates as economically valuable in markets they determine to be attractive in light of the terms that we are seeking and other available products for licensing by other companies. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators. Our ability to reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. If we are unable to reach agreements with suitable collaborators on a timely basis, on acceptable terms, or at all, we may have to curtail the development of a product candidate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional expertise and additional capital, which may not be available to us on acceptable terms, or at all. If we fail to enter into collaborations or do not have sufficient funds or expertise to undertake the necessary development and commercialization activities, we may not be able to further develop our product candidates, bring them to market and generate revenue from sales of drugs or continue to develop our technology, and our business may be materially and adversely affected. Even if we are successful in our efforts to establish new strategic collaborations, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such strategic collaborations if, for example, development or approval of a product candidate is delayed or sales of an approved product are disappointing. Any delay in entering into new strategic collaboration agreements related to our product candidates could delay the development and commercialization of our product candidates and reduce their competitiveness even if they reach the market.

Risks Related to Our Common Stock

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

Similar to the trading prices of the common stock of other biopharmaceutical companies, the trading price of our common stock is subject to wide fluctuations in response to various factors, some of which are beyond our control, including limited trading volume. In addition to the factors discussed in this "Risk Factors" section and elsewhere in this Annual Report on Form 10-K, these factors include:

- any delay in identifying potential product candidates for our other development programs;
- any delay in our regulatory filings for SRK-015 and SRK-181 and any adverse development or perceived adverse development with respect to the applicable regulatory authority's review of such filings, including without limitation the FDA's issuance of a "refusal to file" letter or a request for additional information;
- adverse results or delays in any preclinical studies or clinical trials for SRK-015 or SRK-181, including the results of our TOPAZ Phase 2 clinical trial for SRK-015 and the Phase 1 clinical trial for SRK-181;
- our decision to initiate a clinical trial, not to initiate a clinical trial or to terminate an existing clinical trial;
- adverse regulatory decisions, including failure to receive regulatory approval of SRK-015, SRK-181 or any future product candidate;
- changes in laws or regulations applicable to SRK-015, SRK-181 or any future product candidate, including but not limited to clinical trial requirements for approvals;
- adverse developments concerning our manufacturers;

- our inability to obtain adequate product supply for any approved product or inability to do so at acceptable prices;
- our inability to establish collaborations, if needed;
- our failure to commercialize our product candidates, if approved;
- additions or departures of key scientific or management personnel;
- unanticipated serious safety concerns related to the use of SRK-015, SRK-181 or any future product candidate;
- introduction of new products or services offered by us or our competitors;
- announcements of significant acquisitions, strategic collaborations or partnerships, joint ventures or capital commitments by us, our collaborators or our competitors;
- our ability to effectively manage our growth;
- actual or anticipated variations in quarterly operating results;
- our cash position;
- our failure to meet the estimates and projections of the investment community or that we may otherwise provide to the public;
- publication of research reports about us or our industry, or product candidates in particular, or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- changes in the market valuations of similar companies;
- overall performance of the equity markets;
- sales of our common stock by us or our stockholders in the future;
- trading volume of our common stock;
- changes in accounting practices;
- ineffectiveness or inadequacy of our internal controls and procedures;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- significant lawsuits, including patent or stockholder litigation;
- general political and economic conditions; and
- other events or factors, many of which are beyond our control.

In addition, the stock market in general, and the market for biopharmaceutical companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of

these companies. Broad market and industry factors may negatively affect the market price of our common stock, regardless of our actual operating performance. In the past, securities class action litigation has often been instituted against companies following periods of volatility in the market price of a company's securities. This type of litigation, if instituted, could result in substantial costs and a diversion of management's attention and resources, which would harm our business, operating results or financial condition.

We do not intend to pay dividends on our common stock so any returns will be limited to the value of our stock.

We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Furthermore, our ability to pay cash dividends is currently restricted by the terms of our credit facility with Silicon Valley Bank, and future debt or other financing arrangements may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. Any return to stockholders will therefore be limited to the appreciation of their stock.

Our Board members, management, and their affiliates, own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

As of December 31, 2019, our executive officers, directors and their affiliates beneficially hold, in the aggregate, approximately 23.0% of our outstanding voting stock. These stockholders, acting together, are able to significantly influence all matters requiring stockholder approval. For example, these stockholders are able to significantly influence elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest as one of our stockholders.

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 ("EGC"), as defined in the Jumpstart Our Business Startups Act (the "JOBS Act"), enacted in April 2012. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes Oxley Act of 2002, as amended ("Sarbanes Oxley Act");
- reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements;
- exemptions from the requirements of holding nonbinding advisory votes on executive compensation and stockholder approval of any golden parachute payments not previously approved;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements; and
- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure.

We will remain an emerging growth company until the earlier of (1) December 31, 2023 (2) the last day of the fiscal year in which we have total annual gross revenue of at least $1.07 billion or (3) the last day of the fiscal year in which we are deemed to be a large accelerated filer, which requires the market value of our common stock that is held by non-affiliates to exceed $700 million as of the last business date of our most recently completed second fiscal quarter, and (4)

the date on which we have issued more than $1 billion in non-convertible debt during the prior three-year period. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

Under the JOBS Act, emerging growth companies can also delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of delayed adoption of new or revised accounting standards and, therefore, we will be subject to the same requirements to adopt new or revised accounting standards as other public companies that are not emerging growth companies.

Even after we no longer qualify as an emerging growth company, we may still qualify as a "smaller reporting company" if the market value of our common stock held by non-affiliates is below $250 million (or $700 million if our annual revenue is less than $100 million) as of the last business day of our second fiscal quarter in any given year, which would allow us to take advantage of many of the same exemptions from disclosure requirements, including exemption from 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 expect to continue to incur increased costs as a result of operating as a public company, and our management is required to devote substantial time to new compliance initiatives.

As a public company, we incur significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act and rules subsequently implemented by the SEC and Nasdaq have imposed various requirements on public companies, including establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel devote a substantial amount of time to these compliance initiatives. These rules and regulations have significantly increased our legal and financial compliance costs and we anticipate that these activities will become more time-consuming and costly over time.

Pursuant to Section 404, we are required to furnish a report by our management on our internal control over financial reporting, and, once we are no longer an EGC or a "smaller reporting company", we will be required to furnish 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 are 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, 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 neither we nor our independent registered public accounting firm will be able to conclude within the prescribed timeframe that our internal control over financial reporting is effective as required by Section 404. This could result in an adverse reaction to the trading price of our common stock in the financial markets due to a loss of confidence in the reliability of our financial statements.

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

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

We are required to disclose changes made in our internal controls and procedures on a quarterly basis and our management will be required to assess the effectiveness of these controls annually. However, for as long as we are an EGC or a "smaller reporting company", our independent registered public accounting firm will not be required to attest to the effectiveness of our internal controls over financial reporting pursuant to Section 404. We could be an EGC for up to five years following the completion of our IPO and will qualify as a "smaller reporting company" if the market value of our common stock held by non-affiliates is below $250 million (or $700 million if our annual revenue is less than $100 million) as of June 30 in any given year. An independent assessment of the effectiveness of our internal controls over financial reporting could detect problems that our management's assessment might not. Undetected material weaknesses in our internal controls over financial reporting could lead to financial statement restatements and require us to incur the expense of remediation.

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

If any of our existing major stockholders sell substantial amounts of our common stock in the public market, the trading price of our common stock could decline. In addition, as of December 31, 2019, over 21% of our common stock was held by members of our Board and shareholders affiliated with our Board of Directors and if any of them were to sell a portion of their holdings of our common stock, our stock price could be negatively affected.

We issued 980,392 shares to Gilead in December 2018. The shares are subject to a lock-up period with the lock-up for 50% of the shares expiring on December 19, 2020 and the lock-up for the remainder expiring on December 19, 2021, and following the expiration of each such lock-up period, such shares of our common stock may be freely sold in the open market, subject to compliance with applicable securities laws. The sale of these shares in the open market could cause the market price of our common stock to decline or become highly volatile.

In addition, shares of common stock that are either subject to outstanding options or reserved for future issuance under our existing equity compensation plans will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

We have broad discretion in the use of our existing cash, cash equivalents and marketable securities and may not use them effectively.

Our management has broad discretion in the application of our existing cash, cash equivalents and marketable securities. Because of the number and variability of factors that will determine our use of our existing cash and cash equivalents, their ultimate use may vary substantially from their currently intended use. Our management might not apply our existing cash and cash equivalents in ways that ultimately increase the value of your investment. The failure by our management to apply these funds effectively could harm our business.

Anti-takeover provisions under our charter documents and Delaware law could delay or prevent a change of control which could limit the market price of our common stock and may prevent or frustrate attempts by our stockholders to replace or remove our current management.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could delay or prevent a change of control of our company or changes in our board of directors that our stockholders might consider favorable. Some of these provisions include:

- a board of directors divided into three classes serving staggered three-year terms, such that not all members of the board will be elected at one time;

- a prohibition on stockholder action through written consent, which requires that all stockholder actions be taken at a meeting of our stockholders;

- a requirement that special meetings of stockholders be called only by the chairman of the board of directors, the chief executive officer, or by a majority of the total number of authorized directors;

- advance notice requirements for stockholder proposals and nominations for election to our board of directors;

- a requirement that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of not less than two thirds of all outstanding shares of our voting stock then entitled to vote in the election of directors;

- a requirement of approval of not less than two thirds of all outstanding shares of our voting stock to amend any bylaws by stockholder action or to amend specific provisions of our certificate of incorporation; and

- the authority of the board of directors to issue convertible preferred stock on terms determined by the board of directors without stockholder approval and which convertible preferred stock may include rights superior to the rights of the holders of common stock.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which may prohibit certain business combinations with stockholders owning 15% or more of our outstanding voting stock. These anti-takeover provisions and other provisions in our amended and restated certificate of incorporation and amended and restated bylaws could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by the then current board of directors and could also delay or impede a merger, tender offer or proxy contest involving our company. These provisions could also discourage proxy contests and make it more difficult for you and other stockholders to elect directors of your choosing or cause us to take other corporate actions you desire. Any delay or prevention of a change of control transaction or changes in our board of directors could cause the market price of our common stock to decline.

If securities or industry analysts publish inaccurate or unfavorable research about our business, our stock price and trading volume could decline.

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. If one or more of the analysts who covers us downgrades our stock or publishes inaccurate or unfavorable research about our business, our stock price may decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

Our amended and restated bylaws contain certain exclusive forum provisions requiring that substantially all disputes between us and our stockholders be resolved in certain judicial forums, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be 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, our certificate of incorporation or our bylaws, any action to interpret, apply, enforce, or determine the validity of our certificate of incorporation or bylaws, or any action asserting a claim against us that is governed by the internal affairs doctrine. In addition, our amended and restated bylaws contain a provision by virtue of which, unless we consent in writing to the selection of an alternative forum, the U.S. District Court for the District of Massachusetts will be the exclusive forum for any complaint asserting a cause of action arising under the Securities Act. In addition, our amended and restated bylaws provide that any person or entity purchasing or otherwise acquiring any interest in shares of our common stock is deemed to have notice of and consented to the foregoing provisions. We have chosen the U.S. District Court for the District of Massachusetts as the exclusive forum for such causes of action because our principal executive offices are located in Cambridge, Massachusetts. Some companies that have adopted similar federal district court forum selection provisions are currently subject to a suit in the Court of Chancery of the State of Delaware brought by stockholders who assert that the federal district court forum selection provision is not enforceable. On December 19, 2018, the Court of

Chancery of the State of Delaware issued a decision declaring that federal forum selection provisions purporting to require claims under the Securities Act be brought in federal court are ineffective and invalid under Delaware law. On January 17, 2019, the decision was appealed to the Delaware Supreme Court. While the Delaware Supreme Court recently dismissed the appeal on jurisdictional grounds, we expect that the appeal will be re-filed after the Court of Chancery issues a final judgment. Unless and until the Court of Chancery's decision is reversed by the Delaware Supreme Court or otherwise abrogated, we do not intend to enforce our federal forum selection provision designating the District of Massachusetts as the exclusive forum for Securities Act claims. In the event that the Delaware Supreme Court affirms the Court of Chancery's decision or otherwise determines that federal forum selection provisions are invalid, our board of directors intends to amend promptly our amended and restated by-laws to remove our federal forum selection bylaw provision. As a result of the Court of Chancery's decision or a decision by the Delaware Supreme Court affirming the Court of Chancery's decision, or if the federal forum selection provision is otherwise found inapplicable to, or unenforceable in respect of, one or more of the specified actions or proceedings, we may incur additional costs, which could have an adverse effect on our business, financial condition or results of operations. We recognize that the federal district court forum selection clause may impose additional litigation costs on stockholders who assert the provision is not enforceable and may impose more general additional litigation costs in pursuing any such claims, particularly if the stockholders do not reside in or near the Commonwealth of Massachusetts. Additionally, the choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find the choice of forum provision contained in our 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 adversely affect our business and financial condition.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters and operations are located in Cambridge, Massachusetts. In March 2015, we entered into a lease of laboratory and office space at 620 Memorial Drive in Cambridge, Massachusetts. Our amended lease expires in September 2023 and we have an option to extend the lease term for five additional years.

In November 2019, we entered into a lease of laboratory and office space at 301 Binney Street in Cambridge, Massachusetts to be used as our new corporate headquarters. We are currently involved in the construction and design of the space. The expiration date is in August 2025 and we have the option to extend the term by two years. We believe that our existing facilities are adequate to meet our current needs, and that suitable additional space will be available as and when needed.

Item 3. Legal Proceedings

From time to time, we are subject to various legal proceedings and claims that arise in the ordinary course of our business activities. Although the results of litigation and claims cannot be predicted with certainty, as of the date of this Annual Report on Form 10-K, we do not believe we are party to any claim or litigation the outcome of which, if determined adversely to us, would individually or in the aggregate be reasonably expected to have a material adverse effect on our business. Regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 4. Mine Safety Disclosures

None.

PART II

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

Market Information

Our common stock is traded on the Nasdaq Capital Market under the symbol "SRRK". Trading of our common stock commenced on May 24, 2018, following the completion of our IPO. Prior to that time, there was no established public trading market for our common stock.

Stockholders

As of March 1, 2020, there were approximately 50 stockholders of record of our common stock. This number does not include beneficial owners whose shares are held in street name.

Dividends

We have never declared or paid any dividends to our stockholders since our inception and we do not plan to declare or pay cash dividends in the foreseeable future. We currently anticipate that we will retain all available funds and any future earnings for the operation and expansion of our business. Any future determination related to dividend policy will be made at the discretion of our board of directors and will depend on, among other factors, our results of operations, financial condition, capital requirements, contractual restrictions, business prospects and other factors our board of directors may deem relevant. Investors should not purchase our common stock with the expectation of receiving cash dividends.

Equity Compensation Plans

The information required by Item 5 of Form 10-K regarding equity compensation plans is incorporated herein by reference to Item 12 of Part III of this Annual Report on Form 10-K.

Unregistered Sales of Securities

Not applicable.

Issuer Purchases of Equity Securities

None.

Use of Proceeds from Initial Public Offering of Common Stock

On May 29, 2018, we completed the sale of 5,360,000 shares of our common stock in our IPO at a price to the public of $14.00 per share. The underwriters fully exercised their overallotment option on June 1, 2018, and purchased an additional 804,000 shares of our common stock. The offer and sale of the shares in our IPO was registered under the Securities Act pursuant to registration statements on Form S‑1 (File No. 333‑224493), which was filed with the SEC on April 27, 2018 and amended subsequently and declared effective by the SEC on May 23, 2018. Following the sale of the shares in connection with the closing of our IPO, the offering terminated. The offering did not terminate before all the securities registered in the registration statements were sold. Jefferies LLC, Cowen and Company, LLC and BMO Capital Markets Corp. acted as lead book-running managers for the offering. Wedbush PacGrow acted as the co-manager for the offering. We raised approximately $77.8 million in net proceeds after deducting underwriting discounts and commissions and offering expenses payable by us. None of these expenses consisted of direct or indirect payments made by us to directors, officers or persons owning 10% or more of our common stock or to their associates, or to our affiliates. As of December 31, 2019, we had used all of the net offering proceeds, primarily to fund research and

development activities for SRK-015, to fund TGFβ1 and other preclinical research and development activities and for working capital and general corporate purposes. There had been no material change in the planned use of proceeds from our IPO as described in our final prospectus filed with the SEC on May 24, 2018.

Item 6. Selected Financial Data

We are a smaller reporting company as defined by Rule 12b-2 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and are not required to provide the information required under this item.

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

The information contained in this section has been derived from our consolidated financial statements and should be read together with our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K. This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities and Exchange Act of 1934, as amended, the "Exchange Act" and are subject to the "safe harbor" created by those sections. In particular, statements contained in this Annual Report on Form 10-K that are not historical facts, including, but not limited to statements regarding our future expectations, plans and prospects, including without limitation, our expectations regarding the potential of the TGFβ program, our collaboration with Gilead, the potential of SRK-015 as a therapy in SMA and the timeline for and progress in developing SRK-015, the potential of SRK-181 as a cancer immunotherapy and the timeline for and progress in developing SRK-181, and liquidity, constitute forward-looking statements and are made under these safe harbor provisions. Some of the forward-looking statements can be identified by the use of forward-looking terms such as "believes," "expects," "may," "will," "should," "could," "seek," "intends," "plans," "estimates," "anticipates," or other comparable terms. Forward-looking statements involve inherent risks and uncertainties, which could cause actual results to differ materially from those in the forward-looking statements. We caution readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date made. We urge you to consider the risks and uncertainties discussed in greater detail under the heading "Risk Factors" elsewhere in this Annual Report on Form 10-K in evaluating our forward-looking statements. We have no plans to update our forward-looking statements to reflect events or circumstances after the date of this report. As a result of many factors, including those factors set forth under the heading "Risk Factors" elsewhere in this Annual Report on Form 10-K, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a biopharmaceutical company focused on the discovery and development of innovative medicines for the treatment of serious diseases in which signaling by protein growth factors plays a fundamental role. Our novel understanding of the molecular mechanisms of growth factor activation enabled us to develop a proprietary platform for the discovery and development of monoclonal antibodies that locally and selectively target these signaling proteins at the cellular level. We believe this approach, acting in the disease microenvironment, avoids the historical dose-limiting safety challenges associated with inhibiting growth factors for therapeutic effect. We believe our focus on biologically validated growth factors may facilitate a more efficient development path.

Our first product candidate, SRK-015, is a highly selective, fully human, monoclonal antibody, with a unique mechanism of action that results in inhibition of the activation of the growth factor, myostatin, in skeletal muscle. SRK-015 is being developed as a potential first muscle-directed therapy for the treatment of SMA. SRK-015 is being evaluated in our TOPAZ Phase 2 proof-of-concept trial for the treatment of patients with Type 2 and Type 3 SMA. Enrollment in the trial was completed in January 2020 with a total of 58 patients enrolled. In November 2019, we announced preliminary PK and PD data from the first 29 patients enrolled in the TOPAZ trial that showed dose-proportional drug exposure and demonstrated target engagement, as evidenced by dose-dependent increases of up to 100-fold in the serum levels of latent myostatin following SRK-015 treatment. An interim efficacy and safety analysis of all enrolled patients following six months of treatment exposure is planned for mid-2020. Top-line results for the full 12-month treatment period are expected starting in the fourth quarter of 2020 and through the first quarter of 2021.

Our second product candidate, SRK-181, is being developed for the treatment of cancers that are resistant to CPI therapies, such as anti-PD-(L)1 antibody therapies. SRK-181 is a potent and highly selective inhibitor of the activation of latent TGFβ1. In the first quarter of 2020, we initiated a Phase 1 proof-of-concept clinical trial of SRK-181 in patients with locally advanced or metastatic solid tumors that exhibit primary resistance to anti-PD-(L)1 antibodies. This two-part trial consists of a dose escalation portion (Part A) and a dose expansion portion (Part B). Part A will evaluate SRK-181 as a single-agent and in combination with an approved anti-PD-(L)1 antibody therapy) and Part B will evaluate SRK-181 in combination with an approved anti-PD-(L)1 antibody therapy in multiple tumor-specific cohorts, including urothelial carcinoma, cutaneous melanoma, non-small cell lung cancer, and other solid tumors. Initial clinical data, such as biomarker data, from Part A of the trial is expected in the second half of 2020 with clinical response and safety data from Part B of the trial anticipated throughout 2021.

Utilizing our proprietary platform, we continue to create a pipeline of novel product candidates with the potential to transform the lives of patients suffering from a wide range of serious diseases, including neuromuscular disorders, cancer, fibrosis and anemia. As an example, we are discovering and developing potent and selective inhibitors of the activation of TGFβ in collaboration with Gilead for the treatment of fibrotic disease. We also intend to nominate a product candidate in 2020 that targets RGMc, a co-receptor of bone morphogenetic protein 6 ("BMP6"), another member of the TGFβ superfamily, to pursue in iron-restricted anemias.

In June and July 2019, we sold 3,450,000 shares of our common stock, including the exercise of the overallotment option, through an underwritten public offering at a price of $15.00 per share. The offering was made pursuant to our effective shelf registration statement on Form S-3. As a result of the offering, we received aggregate net proceeds, after underwriting discounts and commissions and other offering expenses, of approximately $48.3 million.

Since inception, we have incurred significant operating losses. Our net losses were $51.0 million and $49.3 million for the years ended December 31, 2019 and 2018, respectively. As of December 31, 2019, we had an accumulated deficit of $157.8 million. We expect to continue to incur significant expenses and operating losses for the foreseeable future. In addition, we anticipate that our expenses will increase in connection with our ongoing activities, as we:

- continue development activities for SRK-015, our first product candidate, including the conduct of our TOPAZ Phase 2 clinical trial;
- continue research and development activities for SRK-181, including the conduct of our Phase 1 clinical trial;
- continue research and development activities to support our collaboration with Gilead;
- continue research and development activities to allow us to nominate a product candidate that targets RGMc to pursue in iron-restricted anemias;
- continue to discover, validate and develop additional product candidates through the use of our proprietary platform;
- maintain, expand and protect our intellectual property portfolio;
- hire additional research, development and business personnel; and
- continue to build the infrastructure to support our operations as a public company.

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from the sale of products in the near future. If we successfully complete clinical development and obtain regulatory approval for SRK-015, SRK-181 or any of our future product candidates, we may generate revenue in the future from product sales. In addition, if we obtain regulatory approval for SRK-015, SRK-181 or any of our future product candidates, we expect to incur significant expenses related to developing our commercialization capability to support product sales, marketing and distribution activities.

Financial Operations Overview

Revenue

No revenues have been recorded from the sale of any commercial product. Revenue generation activities have been limited to collaborations, containing research services and the issuance of a license. Currently, revenue is being recognized related to the Gilead Collaboration Agreement which was executed in December 2018, and we began recognizing associated revenue in 2019. Under the Gilead Collaboration Agreement, Gilead has exclusive options to license worldwide rights to product candidates that emerge from three of the Company's Gilead Programs.

Revenue associated with the research and development and license performance obligations relating to the Gilead Programs is recognized as revenue as the research and development services are provided using an input method, according to the costs incurred on each Gilead Program and the costs expected to be incurred in the future to satisfy the performance obligation. The transfer of control occurs over time. In management's judgment, this input method is the best measure of progress towards satisfying the performance obligations. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition. The estimated remaining costs is highly subjective, as the research is novel, therefore efforts to be successful may be significantly different than the estimated costs made at the balance sheet date. The amounts received that have not yet been recognized as revenue are recorded in deferred revenue on our consolidated balance sheet. We expect to recognize the deferred revenue according to costs incurred, over the remaining research term for each respective Gilead Program, which is up to three years from the execution of the agreement; each research term is dependent on the timing of Gilead either exercising its options for the Gilead Programs or terminating further development on the Gilead Programs prior to the expiration date of the research term.

Operating Expenses

Research and Development

Research and development expenses consist primarily of costs incurred for our research and development activities, including our product candidate discovery efforts, preclinical studies, manufacturing, and clinical trials under our research programs, which include:

- employee-related expenses, including salaries, benefits and equity-based compensation expense for our research and development personnel;
- expenses incurred under agreements with third parties that conduct research and development and preclinical activities on our behalf;
- expenses incurred under agreements related to our clinical trials, including the costs for investigative sites and contract research organizations ("CROs"), that conduct our clinical trials;
- manufacturing process-development, clinical supplies and technology-transfer expenses;
- consulting and professional fees related to research and development activities;
- costs of purchasing laboratory supplies and non-capital equipment used in our internal research and development activities;
- costs related to compliance with clinical regulatory requirements; and
- facility costs and other allocated expenses, which include expenses for rent and maintenance of facilities, insurance, depreciation and other supplies.

Research and development costs are expensed as incurred. Costs for certain activities are recognized based on an evaluation of the progress to completion of specific tasks. Nonrefundable advance payments for research and development goods and services to be received in the future from third parties are deferred and capitalized. The capitalized amounts are expensed as the related services are performed.

A significant portion of our research and development costs have been external costs, which we track on a program-by-program basis after a clinical product candidate has been identified. However, we do not allocate our internal research and development expenses, consisting primarily of employee related costs, depreciation and other indirect costs, on a program-by-program basis as they are deployed across multiple projects.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials, as well as the associated clinical trial material requirements. We expect research and development costs to increase for the foreseeable future as our product candidate development programs progress, and we expect to incur additional costs in connection with our research and development activities under our collaboration with Gilead. However, we do not believe that it is possible at this time to accurately project total program-specific expenses through commercialization. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

The successful development of SRK-015, SRK-181 and any future product candidates is uncertain. Accordingly, at this time, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts that will be necessary to complete the remainder of the development of SRK-015, SRK-181 and any future product candidates. We are also unable to predict when, if ever, material net cash inflows will commence from the sale of our product candidates, if approved. This is due to the numerous risks and uncertainties associated with developing product candidates, including the uncertainty of:

- the scope, progress, outcome and costs of our preclinical development activities, clinical trials and other research and development activities;
- establishing an appropriate safety profile;
- successful enrollment in and completion of clinical trials;
- whether our product candidates show safety and efficacy in our clinical trials;
- receipt of marketing approvals from applicable regulatory authorities, if any;
- establishing commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;
- significant and changing government regulation;
- commercializing the product candidates, if and when approved, whether alone or in collaboration with others; and
- continued acceptable safety profile of the products following any regulatory approval.

A change in the outcome of any of these variables with respect to the development of SRK-015, SRK-181 or any of our future product candidates could significantly change the costs and timing associated with the development of that product candidate.

General and Administrative

General and administrative expenses consist primarily of employee-related expenses, including salaries, benefits and equity-based compensation expenses for personnel in executive, finance, business development, investor relations, legal, information technology and human resources functions. Other significant general and administrative expenses include facility costs not otherwise included in research and development expenses, legal fees relating to patent and corporate matters and fees for accounting, consulting services, and corporate expenses.

We anticipate that our general and administrative expenses will increase in the future as our business expands to support expected growth in research and development activities, including the continued development of our product candidates. These increases will likely include increased costs related to the hiring of additional personnel, as well as fees to outside consultants, among other expenses. We also anticipate continued expenses associated with being a public company, including costs for audit, legal, regulatory and tax-related services, director and officer insurance premiums and investor relations costs.

Other Income (Expense), Net

Other income (expense), net consists primarily of interest income earned on our cash and cash equivalents and marketable securities, interest expense incurred on our credit facility, including amortization of debt discount and debt issuance costs, gains and losses on foreign currency invoices and non-cash changes in the fair value of the warrant issued in connection with our credit facility.

Results of Operations

Comparison of the Years Ended December 31, 2019 and 2018

The following table summarizes our results of consolidated operations for the years ended December 31, 2019 and 2018 (in thousands, except percentages):

	Year Ended December 31,		Change	
	2019	2018	$	%
Revenue	$ 20,492	$ —	$ 20,492	100.0 %
Operating expenses:				
Research and development	54,217	36,310	17,907	49.3 %
General and administrative	20,817	14,382	6,435	44.7 %
Total operating expenses	75,034	50,692	24,342	48.0 %
Loss from operations	(54,542)	(50,692)	(3,850)	7.6 %
Other income (expense), net	3,542	1,366	2,176	*NM
Net loss	$ (51,000)	$ (49,326)	$ (1,674)	3.4 %

* NM means not meaningful.

Revenue

Revenue was $20.5 million for the year ended December 31, 2019, which was related to the Gilead Collaboration Agreement executed in December 2018. Revenue associated with the research and development and license performance obligations relating to the Gilead Programs is recognized as the research and development services are provided using a cost input method. A $25.0 million preclinical milestone was achieved in December 2019 through the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies. As a result, the associated $25 million was

included in the transaction price allocated to the performance obligations as of December 31, 2019. No revenue was recognized for the year ended December 31, 2018.

Operating Expenses

Research and Development

Research and development expense was $54.2 million for the year ended December 31, 2019 compared to $36.3 million for the year ended December 31, 2018, an increase of $17.9 million, or 49.3%. The following table summarizes our research and development expense for the years ended December 31, 2019 and 2018 (in thousands, except percentages):

	Year Ended December 31,		Change	
	2019	2018	$	%
External costs by program:				
SRK-015	$ 10,643	$ 12,281	$ (1,638)	(13.3)%
SRK-181	14,121	—	14,121	100.0 %
Other early programs and unallocated costs	6,089	8,043	(1,954)	(24.3)%
Total external costs	30,853	20,324	10,529	51.8 %
Internal costs:				
Employee compensation and benefits	15,853	10,863	4,990	45.9 %
Facility and other	7,511	5,123	2,388	46.6 %
Total internal costs	23,364	15,986	7,378	46.2 %
Total research and development expense	$ 54,217	$ 36,310	$ 17,907	49.3 %

The increase in research and development expense was primarily attributable to the following:

- An increase in our external research and development costs of $10.5 million, which primarily consisted of:
    - Consistent with our previously stated plans to advance our immuno-oncology pipeline, we are investing in SRK-181, which we declared in early 2019 to be our next product candidate. The $14.1 million increase in costs associated with SRK-181 includes manufacturing costs in preparation for our Phase 1 clinical trial as well as a one-time option fee owed upon its product candidate declaration, partially offset by:
        - $2.0 million decrease in costs related to other early development candidates and unallocated costs; and
        - $1.6 million decrease in our costs associated with SRK-015, due to timing of manufacturing development in 2018.
- $7.4 million increase in internal research and development costs, which was primarily driven by an increase in employee compensation and benefits costs, associated with increased headcount and related overhead as we continued to build out our research and development functions, in addition to an increase in facility costs as we added the additional space to our current location in July 2018.

We expect our research and development expenses to increase as we continue to advance the development of our product candidates, including SRK-015, through our TOPAZ Phase 2 clinical trial, and SRK-181, through our Phase 1 clinical trial. Additionally, we expect to continue to conduct research under the Gilead collaboration.

General and Administrative

General and administrative expense was $20.8 million for the year ended December 31, 2019 compared to $14.4 million for the year ended December 31, 2018, an increase of $6.4 million or 44.7%. The increase in general and administrative expense was primarily attributable to an increase of $4.9 million in employee compensation and benefits, related to increased headcount, $1.0 million in professional services, and $0.5 million in other costs, such as those related to operating as a public company. The current year growth in general and administrative expense is primarily attributed to operating as a public company for a full year as compared to the prior year with the completion of our IPO in May 2018.

We anticipate that our general and administrative expenses will increase in the future as our business expands to support expected growth in research and development activities, including the continued development of our product candidates.

Other Income (Expense), Net

The increase in other income (expense), net was attributable to increased income earned on our investment portfolio, associated with higher average cash balances and higher interest rates during the year ended December 31, 2019, as compared to the year ended December 31, 2018. This increase was partially offset with the change in fair value of the warrant during the year ended December 31, 2018. Previously, the warrant was classified as a liability and re-measured at its fair value at each balance sheet date and recorded in other expense. Subsequent to our IPO, the warrant was classified as equity and no longer valued at fair value.

Liquidity and Capital Resources

Sources of Liquidity

Since our inception, we have not generated any product revenue and have incurred significant operating losses and negative cash flows from our operations. We have funded our operations to date primarily with proceeds from the sale of our convertible preferred stock and units in private placements before our IPO, and sale of our common stock through our IPO, to Gilead in an exempt private placement, and through a secondary public offering, as well as payments from our research collaborations.

The following table provides information regarding our total cash and cash equivalents and marketable securities at December 31, 2019 and December 31, 2018 (in thousands):

	December 31, 2019	December 31, 2018
Cash and cash equivalents	$ 36,308	$ 115,069
Marketable securities	121,140	60,576
Total cash, cash equivalents and marketable securities	$ 157,448	$ 175,645

During the year ended December 31, 2019, our cash, cash equivalents and marketable securities balance decreased by approximately $18.2 million. The change was primarily the result of cash used to operate our business, including payments related to, among other things, research and development and general and administrative expenses as we continued to invest in our primary product candidates and supported our internal research and development efforts. We also made capital purchases and final payments on our debt. This spend was partially offset by net proceeds from the sale of our common stock in a secondary offering in June and July 2019.

In June and July 2019, we sold 3,450,000 shares of our common stock through an underwritten public offering, including an overallotment option. As a result of the offering, we received aggregate net proceeds, after underwriting discounts and commissions and other offering expenses, of approximately $48.3 million.

In December 2018, we entered into the Gilead Collaboration Agreement, with Gilead pursuant to which we will conduct research and pre-clinical development activities relating to the diagnosis, treatment, cure, mitigation or prevention of diseases, disorders or conditions, other than in the field of oncology in accordance with a pre-determined research plan. Pursuant to the Gilead Collaboration Agreement, Gilead made non-refundable payments of $80.0 million, including an upfront payment and an equity investment. In December 2019, we achieved a $25 million preclinical milestone for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies, and subsequently received the associated payment in January 2020.

In May 2018, we completed our IPO, in which we issued and sold 6,164,000 shares of common stock, including all additional shares available to cover overallotments, resulting in net proceeds of $77.8 million after deducting underwriting discounts and commissions and other offering costs payable by us.

From inception and prior to the IPO, we primarily funded our operations with the net proceeds of $109.2 million from sales of our convertible preferred stock and units.

Cash Flows

The following table provides information regarding our cash flows for the years ended December 31, 2019 and 2018 (in thousands):

	Year Ended December 31,	
	2019	2018
Net cash (used in) provided by operating activities	$ (63,115)	$ 24,571
Net cash used in investing activities	(62,236)	(60,231)
Net cash provided by financing activities	48,883	94,268
Net (decrease) increase in cash and cash equivalents and restricted cash	$ (76,468)	$ 58,608

Net Cash (Used in) Provided by Operating Activities

Net cash used in operating activities was $63.1 million for the year ended December 31, 2019 and consisted of our net loss of $51.0 million and changes in our assets and liabilities of $21.2 million, of which $25.0 million is a change in accounts receivable related to the milestone achieved in the Gilead collaboration. The uses of cash were partially offset by non-cash adjustments of $9.1 million, primarily from equity-based compensation. Net cash provided by operating activities was $24.6 million for the year ended December 31, 2018 and consisted of changes in our assets and liabilities of $67.9 million, primarily related to a change of $62.9 million from deferred revenue related to the Gilead collaboration and non-cash adjustments of $6.0 million, primarily from equity compensation, partially offset by our net loss of $49.3 million.

Net Cash Used in Investing Activities

Net cash used in investing activities was $62.2 million for the year ended December 31, 2019 compared to $60.2 million for the year ended December 31, 2018. Net cash used in investing activities for both periods was primarily associated with transactions involving our marketable securities, including purchases, sales, and maturities.

Net Cash Provided by Financing Activities

Net cash provided by financing activities was $48.9 million for the year ended December 31, 2019 compared to $94.3 million for the year ended December 31, 2018. Net cash provided by financing activities for the year ended December 31, 2019 consisted primarily of net proceeds from a secondary public offering of common stock in June and July 2019, in addition to proceeds from stock option exercises. Net cash provided by financing activities for the year ended December 31, 2018 consisted primarily of proceeds from our IPO and sale of common stock to Gilead. These amounts were partially offset by principal payments made on outstanding debt in both periods.

Funding Requirements

We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development for, continue and initiate later stage clinical trials for, continue to develop and optimize our manufacturing processes for, and seek marketing approval for, our product candidates, including SRK-015 and SRK-181, and any of our future product candidates. In addition, if we obtain marketing approval for SRK-015, SRK-181 or any of our future product candidates, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. Furthermore, we expect to continue to incur costs associated with operating as a public company.

We expect that our existing cash and cash equivalents will enable us to fund our operating expenses and capital expenditure requirements into the fourth quarter of 2021. However, we will require additional capital in order to

complete clinical development for each of our current programs. We have based this estimate on assumptions that may prove to be wrong, and we may use our available capital resources sooner than we currently expect. Our future capital requirements will depend on many factors, including:

- the costs and timing of developing of our product candidates, SRK-015 and SRK-181, including the TOPAZ Phase 2 clinical trial for SRK-015, the Phase 1 clinical trial for SRK-181, and the costs and timing of conducting future clinical trials;
- the costs of future manufacturing of SRK-015, SRK-181 and any other product candidates;
- the scope, progress, results and costs of discovery, preclinical development, laboratory testing and clinical trials for other potential product candidates we may develop, if any;
- the costs of identifying and developing, or in-licensing or acquiring, additional product candidates and technologies;
- the costs, timing and outcome of regulatory review of our product candidates;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the achievement of milestones or occurrence of other developments that trigger payments under any collaboration agreements, license agreements, or other agreements we might have at such time;
- the costs of seeking marketing approvals for our product candidates that successfully complete clinical trials, if any;
- the costs and timing of future commercialization activities, including product sales, marketing, manufacturing and distribution, for any of our product candidates for which we receive marketing approval;
- the amount of revenue, if any, received from commercial sales of our product candidates, should any of our product candidates receive marketing approval;
- the costs of preparing, filing and prosecuting patent applications, obtaining, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- our headcount growth and associated costs as we expand our business operations and research and development activities;
- the costs of expanding our infrastructure and facilities to accommodate our growing employee base, including adding equipment and physical infrastructure to support our research and development; and
- the costs of operating as a public company.

Identifying potential product candidates and conducting preclinical studies and clinical trials is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of products that we do not expect to be commercially available for many years, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. To the

extent that we raise additional capital through the sale of equity or convertible debt securities, common stockholder ownership interests may be diluted, and the terms of these securities may include liquidation or other preferences that could adversely affect the rights of a common stockholder. Additional debt financing, if available, may involve agreements that include restrictive covenants that limit our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends, that could adversely impact our ability to conduct our business.

If we raise funds through collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Critical Accounting Policies and Use of Estimates

This management's discussion and analysis is based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make judgments and estimates that affect the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. We base our estimates on historical experience, known trends and events and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgements about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. On an ongoing basis, we evaluate our judgments and estimates in light of changes in circumstances, facts and experience. The effects of material revisions in estimates, if any, will be reflected in the consolidated financial statements prospectively from the date of change in estimates. Our actual results may differ from these estimates under different assumptions or conditions.

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

Accrued Research and Development Expenses

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. We make estimates of our accrued expenses as of each balance sheet date based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. The significant estimates in our accrued research and development expenses include the costs incurred for services performed by our vendors in connection with research and development activities for which we have not yet been invoiced. In certain instances, we prepay for services to be provided in the future. These amounts are expensed as the services are performed.

We base our expenses related to research and development activities on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid balance accordingly. Nonrefundable advance payments for goods and services that will be used in future research and

development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

Although we do not expect our estimates to be materially different from amounts incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period. To date, there have been no material differences between our estimates of such expenses and the amounts incurred.

Determination of the Fair Value of Equity-Based Awards

We determine the fair value of restricted common stock awards granted based on the fair value of our common stock less any purchase price, as applicable. We estimate the fair value of stock option awards granted using the Black-Scholes option-pricing model, which uses as inputs the fair value of our common stock and subjective assumptions we make, including the expected stock price volatility, the expected term of the award, the risk-free interest rate and expected dividends. Due to the lack of a public market for the trading of our common stock prior to our IPO, and a lack of company-specific historical and implied volatility data, we base the estimate of expected volatility on the historical volatility of a representative group of publicly traded companies for which historical information is available. The historical volatility is generally calculated based on a period of time commensurate with the expected term assumption. We use the simplified method to calculate the expected term for options granted to employees and directors. We utilize this method as we do not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term. For grants to non-employees, ASU 2018-07 allows entities to use the expected term to measure non-employee options or elect to use the contractual term as the expected term, on an award-by-award basis. The risk-free interest rate is based on a U.S. treasury instrument whose term is consistent with the expected term of the stock options. The expected dividend yield is assumed to be zero as we have never paid dividends and do not have current plans to pay any dividends on our common stock.

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

Revenue Recognition

No revenues have been recorded from the sale of any commercial product. Revenue generation activities have been limited to collaborations, containing research services and the issuance of a license. Currently, revenue is being recognized related to the Gilead Collaboration Agreement which was executed in December 2018. We began recognizing associated revenue in 2019 over the period that research is performed under the collaboration. We account for revenue under ASC Topic 606, Revenue from Contracts with Customers (“ASC 606”).

Under ASC 606, we recognize revenue when our customer obtains control of promised goods or services, in an amount that reflects the consideration which we expect to receive in exchange for those goods or services. To determine the appropriate amount of revenue to be recognized for arrangements determined to be within the scope of ASC 606, we perform the following five steps: (i) identification of the contract(s) with the customer, (ii) identification of the promised goods or services in the contract and determination of whether the promised goods or services are performance obligations, (iii) measurement of the transaction price, (iv) allocation of the transaction price to the performance obligations, and (v) recognition of revenue when (or as) we satisfy each performance obligation. We only apply the five-step model to contracts when it is probable that we will collect the consideration we are entitled to in exchange for the goods or services we transfer to our customer.

Identification of the Contract(s) with the Customer

We account for a contract with a customer that is within the scope of ASC 606 when all of the following criteria are met: (i) the arrangement has been approved by the parties and the parties are committed to perform their respective obligations, (ii) each party's rights regarding the goods or services to be transferred can be identified, (iii) the payment

terms for the goods or services to be transferred can be identified, (iv) the arrangement has commercial substance and (v) collection of substantially all of the consideration to which we will be entitled in exchange for the goods or services that will be transferred to the customer is probable.

Identification of the Performance Obligations

Performance obligations are promised goods or services in a contract to transfer a distinct good or service to the customer. Promised goods or services are considered distinct when: (i) the customer can benefit from the good or service on its own or together with other readily available resources and (ii) the promised good or service is separately identifiable from other promises in the contract. In assessing whether promised goods or services are distinct, we consider factors such as the stage of development of the underlying intellectual property, the capabilities of our customer to develop the intellectual property on their own and whether the required expertise is readily available. Arrangements that include rights to additional goods or services that are exercisable at a customer's discretion are generally considered options. We assess if these options provide a material right to the customer and if so, they are considered performance obligations. The identification of material rights requires judgments related to the determination of the value of the underlying license relative to the option exercise price, including assumptions about technical feasibility and the probability of developing a candidate that would be subject to the option rights.

Determination of the Transaction Price

We estimate the transaction price based on the amount of consideration we expect to receive for transferring the promised goods or services in the contract. The consideration may include both fixed consideration and variable consideration. At the inception of each arrangement that includes variable consideration, we evaluate the amount of the potential payments and the likelihood that the payments will be received. We utilize either the most likely amount method or expected value method to estimate the transaction price based on which method better predicts the amount of consideration expected to be received. If it is probable that a significant revenue reversal would not occur, the variable consideration is included in the transaction price.

We evaluate whether development, regulatory, and commercial milestone payments are considered probable of being reached and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within our control or the licensee's control, such as regulatory approvals, are not considered probable of being achieved until those approvals are received. At the end of each reporting period, we re-evaluate the probability of achievement of such milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect collaboration revenue and earnings in the period of adjustment.

For sales-based royalties, including milestone payments based on the level of sales, we determine whether the sole or predominant item to which the royalties relate is a license. When the license is the sole or predominant item to which the sales-based royalty relates, we recognize revenue at the later of: (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, we have not recognized any sales-based royalty revenue resulting from our arrangement.

Allocation of Transaction Price

We allocate the transaction price based on the estimated standalone selling price. We must develop assumptions that require judgment to determine the standalone selling price for each performance obligation identified in the contract. We utilize key assumptions to determine the standalone selling price, which may include other comparable transactions, pricing considered in negotiating the transaction and the estimated costs. Estimating costs for research and development programs is subjective as we estimate the costs anticipated to successfully complete the research performance obligations. As the research is novel, efforts to be successful may be significantly different than the estimated costs at the beginning of the contract. Certain variable consideration is allocated specifically to one or more performance obligations in a contract when the terms of the variable consideration relate to the satisfaction of the performance obligation and the

resulting amounts allocated to each performance obligation are consistent with the amounts we would expect to receive for satisfying each performance obligation.

Recognition of Revenue

We utilize judgment to determine whether the performance obligation is satisfied over time or at a point in time. We determine the appropriate method of measuring progress performance obligations satisfied over time for purposes of recognizing revenue, such as by using an input method based on costs incurred compared to the costs expected to be incurred in the future to satisfy the performance obligation. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition. The estimated remaining costs is highly subjective, as the research is novel, therefore efforts to be successful may be significantly different than the estimated costs made at the balance sheet date. If the license to our intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we will recognize revenue from non-refundable, up-front fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license.

We receive payments from customers based on billing schedules established in each contract. Up-front payments and fees are recorded as deferred revenue upon receipt or when due until we perform our obligations under these arrangements. Amounts are recorded as accounts receivable when our right to consideration is unconditional.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined under applicable SEC rules.

Recent Accounting Pronouncements

We have reviewed all recently issued standards and have determined that, other than Recently Issued Accounting Pronouncements as disclosed in Note 2 to our audited consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K, such standards will not have a material impact on our financial statements or do not otherwise apply to our operations.

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

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide the information required under this item.

Item 8. Financial Statements and Supplementary Data

Our financial statements, together with the report of our independent registered public accounting firm, appear in this Annual Report on Form 10-K beginning on page F-1.

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

None.

Item 9A. Controls and Procedures.

Management's Evaluation of our Disclosure Controls and Procedures

We maintain "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is (1) recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (2) accumulated and communicated to our management, including our principal executive officer

and principal accounting officer, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives.

Our management, with the participation of our chief executive officer (principal executive officer) and senior vice president, finance (principal accounting officer), has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2019, the end of the period covered by this Annual Report on Form 10-K. Based upon such evaluation, our chief executive officer and senior vice president, finance have concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of such date. We continue to review and document our disclosure controls and procedures, including our internal controls and procedures for financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined in Exchange Act Rule 13a–15(f) and 15d-15(d) under the Exchange Act. Our internal control system was designed to provide reasonable assurance to our management and our Board regarding the preparation and fair presentation of published financial statements. All internal control systems, no matter how well designed have inherent limitations. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation. Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2019. In making this assessment, our management used the criteria set forth in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013 (COSO criteria). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2019. This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm due to a transition period established by rules of the SEC for "emerging growth companies".

Changes in Internal Controls Over Financial Reporting

No change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the year ended December 31, 2019 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers, and Corporate Governance

The information required under this item is incorporated herein by reference to the Company's definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the SEC not later than 120 days after the close of the Company's fiscal year ended December 31, 2019.

Item 11. Executive Compensation

The information required under this item is incorporated herein by reference to the Company's definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the SEC not later than 120 days after the close of the Company's fiscal year ended December 31, 2019.

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

The information required under this item is incorporated herein by reference to the Company's definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the SEC not later than 120 days after the close of the Company's fiscal year ended December 31, 2019.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required under this item is incorporated herein by reference to the Company's definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the SEC not later than 120 days after the close of the Company's fiscal year ended December 31, 2019.

Item 14. Principal Accountant Fees and Services

The information required under this item is incorporated herein by reference to the Company's definitive proxy statement pursuant to Regulation 14A, which proxy statement will be filed with the SEC not later than 120 days after the close of the Company's fiscal year ended December 31, 2019.

PART IV

Item 15. Exhibits, Financial Statements and Schedules

(a)(1) Financial Statements.

Our consolidated financial statements and notes thereto, together with the Reports of Independent Registered Public Accounting Firm are included in Item 8 of this Annual Report on Form 10-K commencing on page F-1.

(a)(2) Financial Statement Schedules.

All financial schedules have been omitted because the required information is either presented in the consolidated financial statements or the notes thereto or is not applicable or required.

(a)(3) Exhibits.

The following exhibits are included in this Annual Report on Form 10-K for the fiscal year ended December 31, 2019 (and are numbered in accordance with Item 601 of Regulation S-K):

Number	Description	Form	File No.	Exhibit No.	Filing Date
3.1	Amended and Restated Certificate of Incorporation of the Registrant	S-1/A	333-224493	3.2	May 8, 2018
3.2	Amendment to Amended and Restated Certificate of Incorporation of the Registrant	S-1/A	333-224493	3.1.1	May 14, 2018
3.3	Amended and Restated By-laws of the Registrant	S-1/A	333-224493	3.4	May 8, 2018
4.1	Investors' Rights Agreement among the Registrant and certain of its stockholders, dated December 22, 2017	S-1	333-224493	4.1	April 27, 2018
4.2	Specimen Stock Certificate evidencing shares of common stock	S-1/A	333-224493	4.2	May 14, 2018
4.3	Amended and Restated Warrant to Purchase Stock, by and between Silicon Valley Bank and the Registrant, dated December 22, 2017	S-1	333-224493	4.3	April 27, 2018
4.4*	Description of Capital Stock				
10.1+	2017 Stock Option and Incentive Plan and forms of award agreements thereunder	S-1	333-224493	10.1	April 27, 2018
10.2+	2018 Stock Option and Incentive Plan and forms of award agreements thereunder	S-1/A	333-224493	10.2	May 14, 2018
10.3+	Senior Executive Cash Incentive Bonus Plan	S-1/A	333-224493	10.3	May 8, 2018
10.4+	2018 Employee Stock Purchase Plan	S-1/A	333-224493	10.4	May 14, 2018
10.5+	Form of Indemnification Agreement	S-1/A	333-224493	10.5	May 14, 2018
10.6†	Exclusive License Agreement by and between the Registrant, and Children's Medical Center, dated as December 16, 2013	S-1	333-224493	10.6	April 27, 2018
10.10+	Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement, by Nagesh K. Mahanthappa, dated October 10, 2012	S-1	333-224493	10.10	April 27, 2018
10.11+	Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement, by Yung H. Chyung, M.D., dated February 2, 2016	S-1	333-224493	10.11	April 27, 2018

10.12+	Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement, by Rhonda M. Chicko, C.P.A., dated April 4, 2018	10-K	001-38501	10.12	March 19, 2019
10.13†	Option and License Agreement by and between the Registrant and Janssen Biotech, Inc., dated as of December 17, 2013	S-1	333-224493	10.13	April 27, 2018
10.14	Lease Agreement by and between 620 Memorial Leasehold LLC and the Registrant, dated March 5, 2015, as amended by the First Amendment dated February 22, 2016 and the Second Amendment dated February 22, 2018	S-1	333-224493	10.14	April 27, 2018
10.15+	Form of Employment Agreement to be entered into by and between Nagesh K. Mahanthappa, Ph.D. and the Registrant.	S-1/A	333-224493	10.15	May 14, 2018
10.16+	Form of Employment Agreement to be entered into by and between Rhonda M. Chicko, C.P.A., and the Registrant.	S-1/A	333-224493	10.16	May 14, 2018
10.17+	Form of Employment Agreement to be entered into by and between Yung H. Chyung, M.D., and the Registrant.	S-1/A	333-224493	10.17	May 14, 2018
10.18+	Separation Agreement, dated as of September 17, 2019, by and between Scholar Rock, Inc. and Rhonda Chicko	8-K	001-38501	10.1	September 23, 2019
10.19††	Master Collaboration Agreement, dated December 19, 2018, by and between the Registrant and Gilead Sciences, Inc.	8-K/A	001-38501	10.1	December 24, 2018
10.20††	Form of License Agreement.	8-K/A	001-38501	10.2	December 24, 2018
10.21	Share Purchase Agreement, dated December 19, 2018, by and between Scholar Rock Holding Corporation and Gilead Sciences, Inc.	8-K/A	001-38501	10.3	December 24, 2018
10.22	Registration Rights Agreement, dated December 19, 2018, by and among the Registrant, Gilead Sciences, Inc. and Scholar Rock Holding Corporation stockholder signatories named therein.	8-K/A	001-38501	10.4	December 24, 2018
10.23	Irrevocable Registration Rights Waiver and Amendment, dated December 19, 2018, by and among the Registrant, Gilead Sciences, Inc. and Scholar Rock Holding Corporation stockholder signatories named therein.	8-K/A	001-38501	10.5	December 24, 2018
10.24	Amended and Restated Collaboration Agreement, dated March 12, 2019, by and between Scholar Rock, Inc. and Adimab, LLC	8-K	001-38501	10.1	March 13, 2019

10.25	Lease Agreement by and between BMR-Rogers Street LLC and Scholar Rock, Inc., dated November 5, 2019. Schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K. A copy of any omitted schedules will be furnished supplementally to the Securities and Exchange Commission upon request.	10-Q	001-38501	10.2	November 12, 2019
21.1*	Subsidiaries of the Registrant				
23.1*	Consent of Independent Registered Public Accounting Firm.				
24.1*	Power of Attorney (included on the signature page to this report).				
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.				
31.2*	Certification of Principal Accounting 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.				
32.1**	Certification of Principal Executive Officer and Principal Accounting Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
101.INS	XBRL Instance Document				
101.SCH	XBRL Taxonomy Extension Schema Document				
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document				
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document				
101.LAB	XBRL Taxonomy Extension Label Linkbase Document				
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document				

* Filed herewith.

** Furnished herewith and not deemed to be "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, the Exchange Act, and shall not be deemed to be incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Exchange Act (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.

\+ Indicates a management contract or compensatory plan.

† Confidential treatment has been granted for certain portions of this exhibit. These portions have been omitted and filed separately with the SEC.

†† Portions of this exhibit have been omitted pursuant to a request for confidential treatment that will be separately filed with the SEC.

Item 16. Form 10-K Summary

Not applicable.

SIGNATURES

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

SCHOLAR ROCK HOLDING CORPORATION

Date: March 12, 2020

By: /s/ Nagesh K. Mahanthappa
Nagesh K. Mahanthappa
President and Chief Executive Officer
(Principal Executive Officer)

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Nagesh K. Mahanthappa and Erin Moore, and each of them, with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney-in-fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this 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 attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys-in-fact and agents or any of them or their or his or her 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.

Signature	Title	Date
/s/ Nagesh K. Mahanthappa Nagesh K. Mahanthappa	President and Chief Executive Officer *(Principal Executive Officer)*	March 12, 2020
/s/ Erin Moore Erin Moore	Senior Vice President, Finance *(Principal Accounting Officer)*	March 12, 2020
/s/ David Hallal David Hallal	Chairman of the Board of Directors	March 12, 2020
/s/ Kristina Burow Kristina Burow	Director	March 12, 2020
/s/ Jeffrey S. Flier Jeffrey S. Flier	Director	March 12, 2020
/s/ Michael Gilman Michael Gilman	Director	March 12, 2020
/s/ Edward Myles Edward Myles	Director	March 12, 2020
/s/ Amir Nashat Amir Nashat	Director	March 12, 2020
/s/ Akshay Vaishnaw Akshay Vaishnaw	Director	March 12, 2020

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SCHOLAR ROCK HOLDING CORPORATION
Index to Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Scholar Rock Holding Corporation

Opinion on the Financial Statements

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

Adoption of ASU No. 2016-02

As discussed in Note 2 to the consolidated financial statements, effective January 1, 2019, the Company changed its method for accounting for leases due to the adoption of Accounting Standards Update (ASU) No. 2016-02, Leases (Topic 842), and the related amendments.

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 2015.

Boston, Massachusetts
March 12, 2020

SCHOLAR ROCK HOLDING CORPORATION
CONSOLIDATED BALANCE SHEETS

(In thousands, except share and per share data)

	December 31, 2019	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	$ 36,308	$ 115,069
Marketable securities	121,140	60,576
Accounts receivable	25,000	—
Prepaid expenses and other current assets	2,719	2,296
Total current assets	185,167	177,941
Property and equipment, net	4,171	3,190
Operating lease right-of-use asset	4,447	—
Restricted cash	2,498	205
Other long-term assets	98	—
Total assets	$ 196,381	$ 181,336
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 1,130	$ 3,303
Accrued expenses	9,610	7,157
Deferred rent	—	16
Operating lease liability	1,135	—
Loan payable	—	424
Deferred revenue	20,923	20,209
Other current liabilities	16	14
Total current liabilities	32,814	31,123
Long-term portion of deferred rent	—	871
Long-term portion of operating lease liability	4,168	—
Other long-term liabilities	9	24
Long-term portion of deferred revenue	46,489	42,695
Total liabilities	83,480	74,713
Commitments and contingencies (Note 12)		
Stockholders' equity:		
Preferred stock, $0.001 par value; 10,000,000 shares authorized at December 31, 2019 and December 31, 2018; no shares issued and outstanding at December 31, 2019 and December 31, 2018	—	—
Common stock, $0.001 par value; 150,000,000 shares authorized and 29,792,922 shares issued and outstanding as of December 31, 2019; 150,000,000 shares authorized and 26,217,701 shares issued and outstanding as of December 31, 2018	30	26
Additional paid-in capital	270,682	213,453
Accumulated other comprehensive income (loss)	37	(8)
Accumulated deficit	(157,848)	(106,848)
Total stockholders' equity	112,901	106,623
Total liabilities and stockholders' equity	$ 196,381	$ 181,336

The accompanying notes are an integral part of these consolidated financial statements.

SCHOLAR ROCK HOLDING CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

(In thousands, except share and per share data)

	Year Ended December 31,	
	2019	2018
Revenue	$ 20,492	$ —
Operating expenses:		
Research and development	54,217	36,310
General and administrative	20,817	14,382
Total operating expenses	75,034	50,692
Loss from operations	(54,542)	(50,692)
Other income (expense), net	3,542	1,366
Net loss	$ (51,000)	$ (49,326)
Net loss per share, basic and diluted	$ (1.85)	$ (3.15)
Weighted average common shares outstanding, basic and diluted	27,537,939	15,655,293
Comprehensive loss:		
Net loss	$ (51,000)	$ (49,326)
Other comprehensive income (loss):		
Unrealized gain (loss) on marketable securities	45	(6)
Total other comprehensive income (loss)	45	(6)
Comprehensive loss	$ (50,955)	$ (49,332)

The accompanying notes are an integral part of these consolidated financial statements.

SCHOLAR ROCK HOLDING CORPORATION
CONSOLIDATED STATEMENTS OF CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)

(In thousands, except share data)

	Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
Balance at December 31, 2017	**43,135,911**	**$ 109,232**	**3,970,586**	**$ 4**	**$ 4,001**	**$ (2)**	**$ (57,525)**	**$ (53,522)**
Unrealized loss on marketable securities	—	—	—	—	—	(6)	—	(6)
Reclassification of warrant to stockholders' equity	—	—	—	—	93	—	—	93
Conversion of convertible preferred stock into common stock	(43,135,911)	(109,232)	15,109,950	15	109,217	—	—	109,232
Sale of common shares sold in IPO, net of issuance costs	—	—	6,164,000	6	77,833	—	—	77,839
Sale of common shares	—	—	980,392	1	17,095	—	—	17,096
Restricted shares forfeited during the period	—	—	(8,125)	—	—	—	—	—
Exercise of stock options	—	—	898	—	6	—	—	6
Equity-based compensation expense	—	—	—	—	5,211	—	—	5,211
Cumulative effective adjustment for ASU 2018-07 (Note 2)	—	—	—	—	(3)	—	3	—
Net Loss	—	—	—	—	—	—	(49,326)	(49,326)
Balance at December 31, 2018	**—**	**$ —**	**26,217,701**	**$ 26**	**$ 213,453**	**$ (8)**	**$ (106,848)**	**$ 106,623**
Unrealized gain on marketable securities	—	—	—	—	—	45	—	45
Sale of common shares, net of issuance costs	—	—	3,450,000	4	48,344	—	—	48,348
Restricted shares forfeited during the period	—	—	(4,210)	—	—	—	—	—
Exercise of stock options	—	—	129,431	—	913	—	—	913
Equity-based compensation expense	—	—	—	—	7,972	—	—	7,972
Net Loss	—	—	—	—	—	—	(51,000)	(51,000)
Balance at December 31, 2019	**—**	**$ —**	**29,792,922**	**$ 30**	**$ 270,682**	**$ 37**	**$ (157,848)**	**$ 112,901**

The accompanying notes are an integral part of these consolidated financial statements.

SCHOLAR ROCK HOLDING CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)

	Year Ended December 31,	
	2019	**2018**
Cash flows from operating activities:		
Net loss	$ (51,000)	$ (49,326)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	1,303	807
Gain or loss on sale of property and equipment	(8)	—
Equity-based compensation	7,972	5,211
Amortization/accretion of investment securities	(1,390)	(345)
Non-cash operating lease expense	997	—
Deferred payroll tax credit	176	272
Change in operating assets and liabilities:		
Accounts receivable	(25,000)	—
Prepaid expenses and other current assets	(739)	(1,276)
Other assets	(98)	—
Accounts payable	(1,342)	1,664
Accrued expenses	2,453	4,361
Deferred rent	—	191
Operating lease liabilities	(888)	—
Deferred revenue	4,508	62,904
Other liabilities	(59)	108
Net cash (used in) provided by operating activities	(63,115)	24,571
Cash flows from investing activities:		
Purchase of property and equipment	(3,115)	(1,492)
Purchase of marketable securities	(235,417)	(75,239)
Proceeds from sale of property and equipment	8	—
Sales and maturities of marketable securities	176,288	16,500
Net cash used in investing activities	(62,236)	(60,231)
Cash flows from financing activities:		
Principal payments on loan payable	(365)	(667)
Proceeds from sale of common stock, net of issuance costs	48,348	94,935
Proceeds from stock option exercises	913	6
Other	(13)	(6)
Net cash provided by financing activities	48,883	94,268
Net (decrease) increase in cash and cash equivalents and restricted cash	(76,468)	58,608
Cash and cash equivalents and restricted cash, beginning of period	115,274	56,666
Cash and cash equivalents and restricted cash, end of period	$ 38,806	$ 115,274
Supplemental disclosure of non-cash items:		
Property and equipment purchases in accounts payable and accrued expenses	$ —	$ 439
Operating lease right-of-use asset obtained in exchange for operating lease obligation	$ 5,444	$ —

The accompanying notes are an integral part of these consolidated financial statements.

1. Nature of the Business and Basis of Presentation

Organization

Scholar Rock Holding Corporation (the "Company") is a biopharmaceutical company focused on the discovery and development of innovative medicines for the treatment of serious diseases in which signaling by protein growth factors plays a fundamental role. The Company's novel understanding of the molecular mechanisms of growth factor activation enabled the development of a proprietary platform for the discovery and development of monoclonal antibodies that locally and selectively target these signaling proteins at the cellular level. The Company's first product candidate, SRK-015, is a highly selective fully human, monoclonal antibody, with a unique mechanism of action that results in inhibition of the activation of the growth factor, myostatin, in skeletal muscle. SRK-015 is being developed as a potential first muscle-directed therapy for the treatment of spinal muscular atrophy ("SMA"). SRK-015 is being evaluated in the Company's TOPAZ Phase 2 proof-of-concept trial for the treatment of patients with Type 2 and Type 3 SMA. The Company's second product candidate, SRK-181, is being developed for the treatment of cancers that are resistant to checkpoint inhibitor ("CPI") therapies, such as anti-PD-1 or anti-PD-L1 (collectively called anti-PD-(L)1) antibody therapies. SRK-181 is a potent and highly selective inhibitor of the activation of latent transforming growth factor beta-1 ("TGFβ1"). In the first quarter of 2020, the Company initiated a Phase 1 proof-of-concept clinical trial of SRK-181 in patients with locally advanced or metastatic solid tumors that exhibit primary resistance to anti-PD-(L)1 antibodies. Additionally, the Company continues to create a pipeline of novel product candidates with the potential to transform the lives of patients suffering from a wide range of serious diseases, including neuromuscular disorders, cancer, fibrosis and anemia. The Company was originally formed in May 2012. Its principal offices are in Cambridge, Massachusetts.

Since its inception, the Company's operations have focused on research and development of monoclonal antibodies that selectively inhibit activation of growth factors for therapeutic effect, as well as establishing the Company's intellectual property portfolio and performing research and development activities. The Company has primarily financed its operations through various equity financings, including the initial public offering of its common stock (the "IPO") in May 2018 and a secondary offering in June 2019 (Note 9), as well as research and development collaboration agreements.

Revenue generation activities have been limited to two collaborations, both containing research services and the issuance of a license. The first agreement, executed in 2013, was with Janssen Biotech, Inc. ("Janssen"), a subsidiary of Johnson & Johnson. The second agreement (the "Gilead Collaboration Agreement"), executed in December 2018, was with Gilead Sciences, Inc. ("Gilead"). The Company began recognizing revenue on the Gilead Collaboration Agreement in 2019. No revenues have been recorded from the sale of any commercial product.

The Company is subject to a number of risks similar to other life science companies, including, but not limited to, successful discovery and development of its drug candidates, raising additional capital, development by its competitors of new technological innovations, protection of proprietary technology and regulatory approval and market acceptance of the Company's products. The Company anticipates that it will continue to incur significant operating losses for the next several years as it continues to develop its product candidates. The Company believes that its existing cash and cash equivalents, and marketable securities at December 31, 2019 will be sufficient to allow the Company to fund its current operations through at least a period of one year after the date the financial statements are issued.

Basis of Presentation

The consolidated financial statements include the accounts of Scholar Rock Holding Corporation and its wholly owned subsidiaries. All intercompany balances have been eliminated in consolidation.

These consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the U.S. ("GAAP"). Any reference in these notes to applicable guidance is meant to refer to the authoritative GAAP

as found in the Accounting Standards Codification ("ASC") and Accounting Standards Update ("ASU") of the Financial Accounting Standards Board ("FASB").

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in accordance with GAAP requires management to make estimates and judgments that may affect the reported amounts of assets and liabilities and related disclosures of contingent assets and liabilities at the date of the financial statements and the related reporting of revenues and expenses during the reporting period. Significant estimates of accounting reflected in these consolidated financial statements include, but are not limited to, estimates related to revenue recognition, research and development, accrued expenses, the valuation of equity-based compensation, including common stock, restricted common stock and stock options, and income taxes. Actual results could differ from those estimates.

Prior to the IPO, the Company utilized significant estimates and assumptions in determining the fair value of its equity-based compensation, including common stock, restricted common stock and stock options. The Company utilized various valuation methodologies in accordance with the framework of the 2013 American Institute of Certified Public Accountants Technical Practice Aid, Valuation of Privately-Held Company Equity Securities Issued as Compensation, to estimate the fair value of its equity awards. Each valuation methodology included estimates and assumptions that required the Company's judgment. These estimates and assumptions included a number of objective and subjective factors, including external market conditions, guideline public company information, the prices at which the Company sold convertible preferred units and convertible preferred stock, the superior rights and preferences of securities senior to the Company's common units and common stock at the time and the likelihood of achieving a liquidity event such as an initial public offering or sale. Significant changes to the assumptions used in the valuations could have resulted in different fair values of common stock, restricted common stock and stock options at each valuation date, as applicable.

Concentration of Credit Risk and Off-Balance Sheet Risk

The Company has no off-balance sheet risk, such as foreign exchange contracts, option contracts or other foreign-hedging arrangements. The Company follows an investment policy approved by the Board of Directors. Its primary objectives are the preservation of capital and maintenance of liquidity. The Company invests only in fixed income instruments denominated and payable in U.S. dollars including obligations of the U.S. government and its agencies and money market funds registered according to SEC Rule 2a-7 of the Investment Company Act of 1940. All securities must have a readily ascertainable market value, must be readily marketable and be U.S. dollar denominated.

Cash and Cash Equivalents and Restricted Cash

The Company considers highly liquid investments with a maturity of three months or less when purchased to be cash equivalents. Cash equivalents are stated at cost, which approximates market value. At December 31, 2019 and 2018, cash equivalents include money market funds that invest primarily in U.S. government-backed securities and treasuries.

Restricted cash consists of letters of credit in the amount of $2.5 million related to its leased facilities. The following table reconciles cash and cash equivalents and restricted cash per the balance sheet to the statement of cash flows:

	As of December 31,	
	2019	2018
Cash and cash equivalents	$ 36,308	$ 115,069
Restricted cash	2,498	205
	$ 38,806	$ 115,274

Property and Equipment

Property and equipment are recorded at cost. Expenditures for major renewals or betterments that extend the useful lives of property and equipment are capitalized; expenditures for maintenance and repairs are charged to expense as incurred. Depreciation is calculated on a straight-line basis over the estimated useful lives of the related asset. Property and equipment are depreciated as follows:

	Estimated Useful Life (in Years)
Laboratory equipment	3 – 5
Computer equipment & software	3
Furniture & fixtures	5
Machinery & equipment	3 – 5
Leasehold improvements	Shorter of the useful life or remaining lease term

Impairment of Long-Lived Assets

Long-lived assets consist of property and equipment and right-of-use assets. Long-lived assets to be held and used are tested for recoverability whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. Factors that the Company considers in deciding when to perform an impairment review include significant underperformance of the business in relation to expectations, significant negative industry or economic trends and significant changes or planned changes in the use of the assets. If an impairment review is performed to evaluate a long-lived asset group for recoverability, the Company compares forecasts of undiscounted cash flows expected to result from the use and eventual disposition of the long-lived asset group to its carrying value. An impairment loss would be recognized when estimated undiscounted future cash flows expected to result from the use of an asset group are less than its carrying amount. The impairment loss would be based on the excess of the carrying value of the impaired asset group over its fair value, determined based on discounted cash flows. The Company did not record any impairment losses on long-lived assets during the years ended December 31, 2019 or 2018.

Leases

Effective January 1, 2019, the Company adopted ASC Topic 842, Leases ("ASC 842"), using the modified retrospective approach and utilizing the effective date as its date of initial application, for which prior periods are presented in accordance with the previous guidance in ASC Topic 840, Leases. The Company elected the package of practical expedients permitted under the transition guidance.

At the inception of an arrangement, the Company determines whether the arrangement is or contains a lease based on the unique facts and circumstances present. Leases with a term greater than one year are recognized on the balance sheet as right-of-use assets, lease liabilities and, if applicable, long-term lease liabilities. Operating lease liabilities and their corresponding right-of-use assets are recorded based on the present value of lease payments over the expected remaining lease term. However, certain adjustments to the right-of-use asset may be required for items such as incentives received. The interest rate implicit in lease contracts is typically not readily determinable. As a result, the Company utilizes its incremental borrowing rates, which are the rates incurred to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment.

In accordance with the guidance in ASC 842, components of a lease should be split into three categories: lease components (e.g. land, building, etc.), non-lease components (e.g. common area maintenance, consumables, etc.), and non-components (e.g. property taxes, insurance, etc.) Then the fixed and in-substance fixed contract consideration (including any related to non-components) must be allocated based on the respective relative fair values to the lease components and non-lease components. For operating leases, lease expense relating to fixed payments is recognized on a straight-line basis over the term and lease expense relating to variable payments is expensed as incurred.

Fair Value Measurements

ASC Topic 820, Fair Value Measurement ("ASC 820"), establishes a fair value hierarchy for instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability and are developed based on the best information available in the circumstances. ASC 820 identifies fair value as the exchange price, or exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, ASC 820 establishes a three-tier fair value hierarchy that distinguishes between the following:

Level 1 — Quoted market prices in active markets for identical assets or liabilities.
Level 2 — Inputs other than Level 1 inputs that are either directly or indirectly observable, such as quoted market prices, interest rates and yield curves.
Level 3 — Unobservable inputs developed using estimates of assumptions developed by the Company, which reflect those that a market participant would use.

To the extent the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair values requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized as Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Segment Information

Operating segments are defined as components of an entity about which separate discrete information is available for evaluation by the chief operating decision maker, or decision-making group, in deciding how to allocate resources and in assessing performance. The Company views its operations and manages its business in one operating segment operating exclusively in the U.S.

Revenue Recognition

The Company accounts for revenue using the provisions of ASC Topic 606, Revenue from Contracts with Customers ("ASC 606"). Under ASC 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine the appropriate amount of revenue to be recognized for arrangements determined to be within the scope of ASC 606, the Company performs the following five steps: (i) identification of the contract(s) with the customer, (ii) identification of the promised goods or services in the contract and determination of whether the promised goods or services are performance obligations, (iii) measurement of the transaction price, (iv) allocation of the transaction price to the performance obligations, and (v) recognition of revenue when (or as) the Company satisfies each performance obligation. The Company only applies the five-step model to contracts when it is probable that the entity will collect consideration it is entitled to in exchange for the goods or services it transfers to the customer. At contract inception, once the contract is determined to be within the scope of ASC 606, the Company assesses the goods or services promised within each contract and determines those that are performance obligations, and assesses whether each promised good or service is distinct. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

The Company accounts for a contract with a customer that is within the scope of ASC 606 when all of the following criteria are met: (i) the arrangement has been approved by the parties and the parties are committed to perform their respective obligations, (ii) each party's rights regarding the goods or services to be transferred can be identified, (iii) the payment terms for the goods or services to be transferred can be identified, (iv) the arrangement has commercial substance and (v) collection of substantially all of the consideration to which the Company will be entitled in exchange for the goods or services that will be transferred to the customer is probable.

The Company first evaluates license and/or collaboration arrangements to determine whether the arrangement (or part of the arrangement) represents a collaborative arrangement pursuant to ASC Topic 808, *Collaborative Arrangements,* based on the risks and rewards and activities of the parties pursuant to the contractual arrangement. The Company accounts for collaborative arrangements (or elements within the contract that are deemed part of a collaborative arrangement), which represent a collaborative relationship and not a customer relationship, outside of the scope of ASC 606. The Company's existing collaborations represent revenue arrangements.

For the arrangements or arrangement components that are subject to revenue accounting guidance, in determining the appropriate amount of revenue to be recognized as it fulfills its obligations under each of its agreements, the Company performs the following steps: (i) identification of the promised goods or services in the contract; (ii) determination of whether the promised goods or services are performance obligations including whether they are distinct in the context of the contract; (iii) measurement of the transaction price, including the constraint on variable consideration; (iv) allocation of the transaction price to the performance obligations; and (v) recognition of revenue when (or as) the Company satisfies each performance obligation. As part of the accounting for these arrangements, the Company must use significant judgment to determine: a) the number of performance obligations based on the determination under step (ii) above and whether those performance obligations are distinct from other performance obligations in the contract; b) the transaction price under step (iii) above; and c) the standalone selling price for each performance obligation identified in the contract for the allocation of transaction price in step (iv) above. The Company uses judgment to determine whether milestones or other variable consideration, except for royalties, should be included in the transaction price as described further below. The transaction price is allocated to each performance obligation on a relative stand-alone selling price basis, for which the Company recognizes revenue as or when the performance obligations under the contract are satisfied. In determining the stand-alone selling price of a license to the Company's proprietary technology or a material right provided by a customer option, the Company considers market conditions as well as entity-specific factors, including those factors contemplated in negotiating the agreements as well as internally developed estimates that include assumptions related to the market opportunity, estimated development costs, probability of success and the time needed to commercialize a product candidate pursuant to the license. In validating its estimated stand-alone selling prices, the Company evaluates whether changes in the key assumptions used to determine its estimated stand-alone selling prices will have a significant effect on the allocation of arrangement consideration between performance obligations.

The Company estimates the transaction price based on the amount of consideration the Company expects to be received for transferring the promised goods or services in the contract. The consideration may include both fixed consideration and variable consideration. At the inception of each arrangement that includes variable consideration, the Company evaluates the amount of the potential payments and the likelihood that the payments will be received. The Company utilizes either the most likely amount method or expected value method to estimate the transaction price based on which method better predicts the amount of consideration expected to be received. If it is probable that a significant revenue reversal would not occur, the variable consideration is included in the transaction price.

Performance obligations are promised goods or services in a contract to transfer a distinct good or service to the customer. Promised goods or services are considered distinct when: (i) the customer can benefit from the good or service on its own or together with other readily available resources and (ii) the promised good or service is separately identifiable from other promises in the contract. In assessing whether promised goods or services are distinct, the Company considers factors such as the stage of development of the underlying intellectual property, the capabilities of the customer to develop the intellectual property on their own and whether the required expertise is readily available.

The Company allocates the transaction price based on the estimated standalone selling price. The Company must develop assumptions that require judgment to determine the standalone selling price for each performance obligation identified in the contract. The Company utilizes key assumptions to determine the standalone selling price, which may include other comparable transactions, pricing considered in negotiating the transaction and the estimated costs. Estimating costs for research and development programs is subjective as the Company estimates the costs anticipated to successfully complete the research performance obligations. As the research is novel, efforts to be successful may be significantly different than the estimated costs at the beginning of the contract. Certain variable consideration is allocated specifically to one or more performance obligations in a contract when the terms of the variable consideration relate to

the satisfaction of the performance obligation and the resulting amounts allocated to each performance obligation are consistent with the amounts the Company would expect to receive for each performance obligation.

For performance obligations which consist of licenses and other promises, the Company utilizes judgment to assess the nature of the combined performance obligation in order to determine whether the combined performance obligation is satisfied over time or at a point in time. The Company determines the appropriate method of measuring progress of combined performance obligations satisfied over time for purposes of recognizing revenue. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition. The estimated remaining costs is highly subjective, as the research is novel, therefore efforts to be successful may be significantly different than the estimated costs made at the balance sheet date. If the license to the Company's intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, the Company will recognize revenue from non-refundable, up-front fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. The Company receives payments from customers based on billing schedules established in each contract. Up-front payments and fees are recorded as deferred revenue upon receipt or when due until the Company performs its obligations under these arrangements. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as current portion of deferred revenue in the accompanying consolidated balance sheets. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portion. Amounts are recorded as accounts receivable when the Company's right to consideration is unconditional. Amounts recognized as revenue, but not yet received or invoiced are generally recognized as contract assets.

Exclusive Licenses – If the license granted in the arrangement is determined to be distinct from the other promises or performance obligations identified in the arrangement, which generally include research and development services, the Company recognizes revenue from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. In assessing whether a license is distinct from the other promises, the Company considers relevant facts and circumstances of each arrangement, including the research and development capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the collaboration partner can benefit from the license for its intended purpose without the receipt of the remaining promise, whether the value of the license is dependent on the unsatisfied promise, whether there are other vendors that could provide the remaining promise, and whether it is separately identifiable from the remaining promise. For licenses that are combined with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition. The measure of progress, and thereby periods over which revenue should be recognized, are subject to estimates by management and may change over the course of the arrangement.

Research and Development Services – The promises under the Company's collaboration and license agreements generally include research and development services to be performed by the Company on behalf of the collaboration partner. For performance obligations that include research and development services, the Company generally recognizes revenue allocated to such performance obligations based on an appropriate measure of progress. The Company utilizes judgment to determine the appropriate method of measuring progress for purposes of recognizing revenue, which is generally an input measure, such as costs incurred. The Company evaluates the measure of progress each reporting period as described under *Exclusive Licenses* above. Reimbursements from the partner that are the result of a collaborative relationship with the partner, instead of a customer relationship, such as co-development activities, are generally recorded as a reduction to research and development expense.

Customer Options – The Company's arrangements may provide a collaborator with the right to certain optional purchases, such as the right to license a target either at the inception of the arrangement or within a pre-defined option period. Under these agreements, fees may be due to the Company (i) at the inception of the arrangement as an upfront fee or payment or (ii) upon the exercise of an option to acquire a license. If an arrangement is determined to contain customer options that allow the customer to acquire additional goods or services, the goods and services underlying the

customer options are not considered to be performance obligations at the outset of the arrangement, as they are contingent upon option exercise. The Company evaluates the customer options for material rights, or options to acquire additional goods or services for free or at a discount. If the customer options are determined to represent a material right, the material right is recognized as a separate performance obligation at the inception of the arrangement. The Company allocates the transaction price to material rights based on the relative stand-alone selling price, which is determined based on the identified discount, and the probability that the customer will exercise the option. Amounts allocated to a material right are not recognized as revenue until, at the earliest, the option is exercised or expires.

Milestone Payments – At the inception of each arrangement that includes milestone payments based on certain events, the Company evaluates whether the milestones are considered probable of being achieved and estimates the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within the control of the Company or the licensee, such as regulatory approvals, are not considered probable of being achieved until those approvals are received. The Company evaluates factors such as the scientific, clinical, regulatory, commercial, and other risks that must be overcome to achieve the particular milestone in making this assessment. There is considerable judgment involved in determining whether it is probable that a significant revenue reversal would not occur. At the end of each subsequent reporting period, the Company reevaluates the probability of achievement of all milestones subject to constraint and, if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect revenues and earnings in the period of adjustment. If a milestone or other variable consideration relates specifically to the Company's efforts to satisfy a single performance obligation or to a specific outcome from satisfying the performance obligation, the Company generally allocates the milestone amount entirely to that performance obligation once it is probable that a significant revenue reversal would not occur.

Royalties – For arrangements that include sales-based royalties, including milestone payments based on a level of sales, and the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (i) when the related sales occur or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, the Company has not recognized any royalty revenue resulting from any of its licensing arrangements.

For a complete discussion of accounting for collaboration revenues, see Note 14, *Agreements.*

Research and Development Expenses and Accruals

Research and development expenses are expensed as incurred and consist of costs incurred in performing research and development activities, including compensation related expenses for research and development personnel, preclinical and clinical activities including cost of supply, overhead expenses including facilities expenses, materials and supplies, amounts paid to consultants and outside service providers, and depreciation of equipment. Upfront license payments related to acquired technologies which have not yet reached technological feasibility and have no alternative future use are also included in research and development expense.

The Company has entered into various research and development service arrangements under which vendors perform various services. The Company records accrued expenses for estimated costs incurred under the arrangements. When evaluating the adequacy of the accrued expenses, the Company analyzed the progress of the studies, trials or other services performed, including invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued expense balances at the end of each reporting period.

Equity-Based Compensation

The Company accounts for equity awards, including common stock, restricted common stock, common stock options, granted to employees as equity award compensation in accordance with ASC Topic 718, Compensation — Stock Compensation ("ASC 718"). ASC 718 requires all stock-based payments to employees, which includes grants of employee equity awards, to be recognized as expense in the statements of operations based on their grant date fair values.

Prior to becoming a public company, the Company estimated the fair value of common stock using an appropriate valuation methodology, based on the guideline public company ("GPC") method or the precedent transaction method which "backsolves" to a preferred price. The use of these valuation approaches requires management to make assumptions with respect to the expected volatility of its common stock, time until a liquidity event and risk-free interest rates. The fair value of each restricted common stock award is based on the fair value of the Company's common stock less any purchase price, if applicable. The fair value of each stock option award is estimated using the Black-Scholes option-pricing model, which uses as inputs the fair value of the Company's common stock and certain subjective assumptions, including the expected stock price volatility, the expected term of the award, the risk-free rate, and expected dividends. Expected volatility is calculated based on reported volatility data for a representative group of publicly traded companies for which historical information was available. The historical volatility is generally calculated based on a period of time commensurate with the expected term assumptions. The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant commensurate with the expected term assumption. The Company uses the simplified method, under which the expected term is presumed to be the midpoint between the vesting date and the end of the contractual term. The Company utilizes this method due to lack of historical exercise data and the plain nature of its stock-based awards. The expected dividend yield is assumed to be zero as the Company has never paid dividends and has no current plans to pay any dividends on common stock.

Compensation expense related to equity awards to employees that are subject to graded vesting is recognized on a straight-line basis, based on the grant date fair value, over the requisite service period of the award, which is generally the vesting term. For awards subject to performance conditions, the Company recognizes equity award compensation expense using an accelerated recognition method over the remaining service period when management determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date.

The Company adopted ASU No. 2018-07, *Compensation—Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting* ("ASU 2018-07") in the fourth quarter of 2018. The standard expands the scope of ASC 718 to include all share-based payment arrangements related to the acquisition of goods and services from both non-employees and employees. Prior to the adoption of ASU 2018-07, for equity awards granted to non-employees, the Company accounted for the related equity award compensation in accordance with the provisions of ASC 718 and ASC Topic 505, Equity, and recognized equity award compensation expense over the related service period of the non-employee award. Equity awards issued to non-employees were recorded at their fair values, using the then-current fair value of the common stock and updated assumption inputs in the Black-Scholes option-pricing model, as applicable, and were periodically revalued as the equity instruments vested. After the adoption of ASU 2018-07, equity-classified share-based payment awards issued to non-employees are measured at grant date fair value similarly to those of employees and are no longer revalued as the equity instruments vest. The new standard allows entities to use the expected term to measure non-employee options or elect to use the contractual term as the expected term, on an award-by-award basis.

The Company classifies equity-based compensation expense in its consolidated statements of operations in the same manner in which the award recipient's salary and related costs are classified or in which the award recipient's service payments are classified.

The Company accounts for forfeitures when they occur.

Convertible Preferred Stock

The Company records all convertible preferred shares at their respective fair values on the dates of issuance less issuance costs. The Company classifies its convertible preferred shares outside of stockholders' equity when the redemption of such shares is outside the Company's control. The Company does not adjust the carrying values of the convertible preferred stock to the liquidation preferences of such units or shares until such time as a deemed liquidation event is probable of occurring.

Comprehensive Loss

Comprehensive loss is the change in equity of a business enterprise during a period from transactions and other events and circumstances from non-owner sources. Comprehensive loss includes net loss and the change in accumulated other comprehensive income (loss) for the period. Accumulated other comprehensive loss consisted entirely of unrealized gains and losses on available-for-sale marketable securities during the period ending December 31, 2019 and 2018.

Net Loss per Share

The Company applies the two-class method to compute basic and diluted net loss per share because it has issued shares that meet the definition of participating securities. The two-class method determines net income (loss) per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income (losses) available to common stockholders for the period to be allocated between common and participating securities based upon their respective rights to share in the earnings as if all income (losses) for the period had been distributed. During periods of loss, there is no allocation required under the two-class method since the participating securities do not have a contractual obligation to fund the losses of the Company.

The Company calculates basic net loss per share by dividing net loss by the weighted average number of common shares outstanding, excluding restricted common stock. The Company calculates diluted net loss per share by dividing net loss by the weighted average number of common shares outstanding, as applicable, after giving consideration to the dilutive effect of convertible preferred stock, restricted common stock, warrants and stock options that are outstanding during the period.

Income Taxes

Income taxes for Scholar Rock Holding Corporation and Scholar Rock, Inc. are recorded in accordance with ASC Topic 740, Income Taxes ("ASC 740"), which provides for deferred taxes using an asset and liability approach. Under this method, deferred income tax assets and liabilities are recognized based on future income tax consequences attributable to differences between the financial statement carrying amount of existing assets and liabilities, and their respective income tax basis. Deferred income tax assets and liabilities are measured using enacted income tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect of changes in income tax rates on deferred income tax assets and liabilities is recognized as income or expense in the period that a valuation allowance for any income tax benefits of which future realization is not more likely than not.

The Company provides reserves for potential payments of tax to various tax authorities related to uncertain tax positions, as necessary. The tax benefits recorded are based on a determination of whether and how much of a tax benefit taken by the Company in its tax filings or positions is "more likely than not" to be realized following resolution of any uncertainty related to the tax benefit, assuming that the matter in question will be raised by the tax authorities.

The Company is open to examination by the Internal Revenue Service for the tax years ended December 31, 2013 to December 31, 2019. Since the Company is in a U.S. loss carryforward position, carryforward tax attributes generated in prior years may still be adjusted upon future examination if they have or will be used in a future period. The Company is currently not under examination by the Internal Revenue Service or any other jurisdictions for any tax years. The Company has not recorded any interest or penalties on any unrecognized tax benefits since its inception.

Marketable Securities

The Company classifies its marketable securities as available-for-sale. Marketable securities with a remaining maturity date greater than one year are classified as non-current. Marketable securities are maintained by an investment manager and consist of U.S. treasury securities. Marketable securities are carried at fair value with the unrealized gains and losses included in accumulated other comprehensive loss as a component of stockholders’ equity until realized. Any premium or discount arising at purchase is amortized and/or accreted to interest income and/or expense over the life of the underlying marketable security.

Although available to be sold to meet operating needs or otherwise, securities are generally held through maturity. The cost of securities sold is determined on a specific identification basis, and realized gains and losses are included in other income (expense) within the statement of operations and comprehensive loss. During the years ended December 31, 2019 and 2018, there was an immaterial amount of realized gains on sales of marketable securities and no marketable securities were adjusted for other than temporary declines in fair value.

The Company evaluates its marketable securities with unrealized losses for other-than-temporary impairment. When assessing marketable securities for other-than-temporary declines in value, the Company considers such factors as, among other things, how significant the decline in value is as a percentage of the original cost, how long the market value of the investment has been less than its original cost, the Company's ability and intent to retain the investment for a period of time sufficient to allow for any anticipated recovery in fair value and market conditions in general. If any adjustment to fair value reflects a decline in the value of the investment that the Company considers to be "other than temporary," the Company would reduce the investment to fair value through a charge to the statement of operations and comprehensive loss. No such adjustments were necessary during the periods presented.

Deferred Offering Costs

The Company capitalizes certain legal, professional accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated. After consummation of the equity financing, these costs are recorded in stockholders' equity as a reduction of additional paid-in capital generated as a result of the offering. Should the planned equity financing be abandoned, the deferred offering costs will be expensed immediately as a charge to operating expenses in the consolidated statement of operations and comprehensive loss.

Recently Adopted Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, Leases, ("ASU 2016-02"), which superseded the lease accounting requirements in ASC 840, Leases and created a new Topic 842, Leases.

In adopting the new standard, the Company elected to utilize the available package of practical expedients permitted under the transition guidance within the new standard, which removed the requirement to reassess previous accounting conclusions around whether arrangements are or contain leases, the classification of leases, and the treatment of initial direct costs. The adoption of this standard resulted in the recognition of operating lease liabilities and right-of-use assets of $6.2 million and $5.4 million, respectively, as of January 1, 2019. There was no cumulative transition adjustment to retained earnings upon adoption of the standard and there was no material effect on the Company's statements of operations or statement of cash flows as the difference relates to previously recorded deferred rent which was eliminated upon adoption of this standard.

Recently Issued Accounting Pronouncements

In August 2018, the FASB issued ASU 2018-15, *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract*. The new standard will align the requirements for capitalizing implementation costs for hosting arrangements (services) with costs for internal-use software (assets). As a result, certain implementation costs incurred in hosting arrangements will be deferred and amortized. The new standard will be effective for the Company on January 1, 2020. The Company does not anticipate a material impact to its net financial position or disclosures as a result of the adoption of ASU 2018-15.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. The standard requires that a financial asset or a group of financial assets measured at amortized cost basis to be presented at the net amount expected to be collected. Under current GAAP, a company only considered past events and current conditions in measuring an incurred loss. Under ASU 2016-13, the information that a company must consider is broadened in developing an expected credit loss estimate for assets measured either collectively or individually. The use of forecasted information incorporates more timely information in the estimate of expected credit loss. The guidance is applied using a modified retrospective, or prospective approach,

depending on a specific amendment. In November 2019, the FASB deferred the effective date for smaller reporting companies to fiscal years beginning after December 15, 2022. The Company does not anticipate a material impact to its net financial position or disclosures as a result of the adoption of ASU 2016-13.

3. Fair Value of Financial Assets and Liabilities

The following tables summarize the assets and liabilities measured at fair value on a recurring basis at December 31, 2019 and 2018 (in thousands):

	Fair Value Measurements at December 31, 2019			
	Total	Level 1	Level 2	Level 3
Assets:				
Money market funds, included in cash and cash equivalents	$ 34,896	$ 34,896	$ —	$ —
Marketable securities:				
U.S. Treasury obligations	121,140	121,140	—	—
Total assets	$ 156,036	$ 156,036	$ —	$ —

	Fair Value Measurements at December 31, 2018			
	Total	Level 1	Level 2	Level 3
Assets:				
Money market funds, included in cash and cash equivalents	$ 114,593	$ 114,593	$ —	$ —
Marketable securities:				
U.S. Treasury obligations	60,576	60,576	—	—
Total assets	$ 175,169	$ 175,169	$ —	$ —

Cash and cash equivalents and marketable securities include investments in money market funds and U.S. government securities that are valued using quoted market prices. Accordingly, money market funds and government funds are categorized as Level 1 as of December 31, 2019 and 2018. There were no transfers of assets between fair value measurement levels during the years ended December 31, 2019 and 2018.

The carrying amounts reflected in the balance sheets for accounts receivable, prepaid expenses and other current assets, accounts payable, and accrued expenses approximate their fair values at December 31, 2019 and 2018, due to their short-term nature.

Upon the completion of the IPO, the Company's outstanding warrant to purchase preferred stock converted into a warrant to purchase common stock and the Company reclassified the fair value of the warrant to additional paid-in capital. As of December 31, 2019, the warrant is currently exercisable for 7,614 shares of the Company's common stock at an exercise price of $3.94 per share.

4. Marketable Securities

The following table summarizes the Company's investments as of December 31, 2019 (in thousands):

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Marketable securities available-for-sale:				
U.S. Treasury obligations	$ 121,103	$ 39	$ (2)	$ 121,140
Total available-for-sale securities	$ 121,103	$ 39	$ (2)	$ 121,140

The following table summarizes the Company's investments as of December 31, 2018 (in thousands):

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Marketable securities available-for-sale:				
U.S. Treasury obligations	$ 60,584	$ —	$ (8)	$ 60,576
Total available-for-sale securities	$ 60,584	$ —	$ (8)	$ 60,576

The aggregate fair value of marketable securities with unrealized losses was $19.6 million and $60.6 million at December 31, 2019 and 2018, respectively. At December 31, 2019 and 2018, 3 investments and 16 investments, respectively, were in an unrealized loss position. All such investments have been in an unrealized loss position for less than a year and these losses are considered temporary. The Company has the ability and intent to hold these investments until a recovery of their amortized cost, which may be until maturity.

5. Property and Equipment, Net

At December 31, 2019 and 2018, property and equipment consists of the following (in thousands):

	December 31, 2019	December 31, 2018
Laboratory equipment	$ 5,432	$ 3,585
Leasehold improvements	1,580	1,578
Computer equipment & software	423	—
Furniture & fixtures	219	219
Machinery & equipment	75	75
Construction in progress	—	89
	7,729	5,546
Less: Accumulated depreciation and amortization	(3,558)	(2,356)
	$ 4,171	$ 3,190

Depreciation and amortization expense was $1.3 million and $0.8 million for the years ended December 31, 2019 and 2018, respectively.

6. Accrued Expenses

At December 31, 2019 and 2018, accrued expenses consist of the following (in thousands):

	As of December 31, 2019	As of December 31, 2018
Accrued external research and development expense	$ 4,088	$ 3,284
Accrued payroll and related expenses	4,380	2,826
Accrued professional and consulting expense	929	890
Accrued other	213	157
	$ 9,610	$ 7,157

7. Convertible Preferred Stock

The Series A-1, A-2, A-3, A-4, B, and C Convertible Preferred Stock are collectively referred to as Convertible Preferred Stock. In conjunction with the IPO, all Convertible Preferred Stock was converted to common stock.

8. Preferred Stock

The Board of Directors or any authorized committee thereof is expressly authorized, to the fullest extent permitted by law, to provide by resolution or resolutions for, out of the unissued shares of Preferred Stock, the issuance of the shares of Preferred Stock in one or more series of such stock, and by filing a certificate of designations pursuant to applicable law of the State of Delaware, to establish or change from time to time the number of shares of each such series, and to fix the designations, powers, including voting powers, full or limited, or no voting powers, preferences and the relative, participating, optional or other special rights of the shares of each series and any qualifications, limitations and restrictions thereof.

In connection with the consummation of the IPO, on May 29, 2018 the Company filed an amended and restated certificate of incorporation which authorized for issuance 10,000,000 shares of Preferred Stock, par value $0.001. As of December 31, 2019, no shares of the Preferred Stock were issued or outstanding.

9. Common Stock

In June and July 2019, the Company sold 3,450,000 shares of its common stock, including the exercise of the overallotment option, through an underwritten public offering at a price of $15.00 per share. The offering was made pursuant to the Company's effective shelf registration statement on Form S‑3. The Company received aggregate net proceeds, after underwriting discounts and commissions and other offering expenses, of approximately $48.3 million.

During the second quarter of 2018, the Company completed its IPO, in which the Company sold 6,164,000 shares of common stock, including all additional shares available to cover overallotments, at a price of $14.00 per share. The Company received aggregate net proceeds of approximately $77.8 million, after deducting underwriting discounts and commissions and other offering expenses payable by the Company. Upon the closing of the IPO, all outstanding shares of convertible preferred stock converted into 15,109,950 shares of common stock and the Company's outstanding warrant to purchase preferred stock converted into a warrant to purchase 7,614 shares of common stock.

In connection with the consummation of the IPO, on May 29, 2018 the Company filed an amended and restated certificate of incorporation, which increased the number of shares of common stock authorized for issuance thereunder by 90,000,000 shares to 150,000,000 shares.

The voting, dividend and liquidation rights of the holders of common stock are subject to and qualified by the rights, powers and preferences of the holders of Preferred Stock. The common stock has the following characteristics:

Voting

The holders of shares of common stock are entitled to one vote for each share of common stock held at any meeting of stockholders and at the time of any written action in lieu of a meeting.

Dividends

The holders of shares of common stock are entitled to receive dividends, if and when declared by the Company's Board of Directors. No dividends have been declared or paid by the company to the holders of common stock since the issuance of the common stock.

Liquidation

The holders of common stock are entitled to share ratably in the Company's net assets available for distribution to its stockholders in the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company or upon the occurrence of a deemed liquidation event.

Shares Reserved For Future Issuance

As of December 31, 2019, the Company had reserved common shares as follows:

	As of December 31, 2019
Common shares reserved for exercise of a warrant	7,614
Common shares reserved for future issuance under the 2018 ESPP	497,920
Common shares reserved for exercise of outstanding stock options under the 2017 and 2018 Plans	2,401,382
Common shares reserved for future issuance under the 2018 Plan	2,684,464
	5,591,380

10. Equity-Based Compensation

Equity Plans

As of December 31, 2019, the Company has three active equity plans, the 2018 Stock Option and Incentive Plan (the "2018 Plan"), the 2017 Stock Option and Incentive Plan (the "2017 Plan"), and the 2018 Employee Stock Purchase Plan (the "2018 ESPP").

2018 Stock Option and Incentive Plan

The 2018 Plan was adopted by the Company's Board of Directors on May 2, 2018, and approved by the Company's stockholders on May 11, 2018. The 2018 Plan has replaced the 2017 Plan as no additional awards will be granted under that plan following the consummation of the IPO. The Company initially reserved 3,139,274 shares of common stock for the issuance of awards under the 2018 Plan (the "Initial Limit"), which included 352,204 unused shares reserved for issuance under the 2017 Plan that became available under the 2018 Plan upon the completion of the IPO.

The 2018 Plan provides for the grant of equity-based incentive awards, including incentive stock options, non-qualified stock options, restricted stock awards, unrestricted stock awards and restricted stock units to the Company's officers, employees, directors and other key persons (including consultants). Stock options granted under the 2018 Plan to employees generally vest over four years. The shares of common stock underlying any awards that are forfeited,

cancelled, repurchased or are otherwise terminated by the Company under the 2018 Plan will be added back to the shares of common stock available for issuance under the 2018 Plan.

The 2018 Plan provides that the number of shares reserved and available for issuance under the plan will automatically increase each January 1, beginning on January 1, 2019, by 4% of the outstanding number of shares of common stock on the immediately preceding December 31 or such lesser number of shares as determined by the Board of Directors or compensation committee (the "Annual Increase"). These limits are subject to adjustment in the event of a stock split, stock dividend or other change in the Company's capitalization.

2017 Stock Option and Incentive Plan

The 2017 Plan provides for the grant of incentive stock options, non-qualified stock options, restricted stock awards, unrestricted stock awards and restricted stock units. Stock options granted under the 2017 Plan to employees generally vest over four years. The number of shares initially reserved for issuance under the 2017 Plan was 3,455,330 shares of common stock. The shares of common stock underlying any awards that are forfeited, cancelled, repurchased or are otherwise terminated by the Company under the 2017 Plan will be added back to the shares of common stock available for issuance under the 2018 Plan.

2018 Employee Stock Purchase Plan

On May 2, 2018, the Board of Directors adopted the 2018 ESPP, and it was approved by the stockholders on May 11, 2018. The 2018 ESPP initially reserved and authorized the issuance of 235,743 shares of common stock to participating employees. The ESPP provides that the number of shares reserved and available for issuance will automatically increase each January 1, beginning on January 1, 2019, by the lesser of (i) 353,614 shares of common stock, (ii) 1% of the outstanding number of shares of the Company's common stock on the immediately preceding December 31 or (iii) such lesser number of shares as determined by the 2018 ESPP administrator. The number of shares reserved under the 2018 ESPP is subject to adjustment in the event of a stock split, stock dividend or other change in the Company's capitalization. As of December 31, 2019, no shares have been issued under the 2018 ESPP.

Total Equity-Based Compensation Expense

The Company recorded equity-based compensation expense related to all equity-based awards for employees and non-employees, which was allocated as follows in the consolidated statements of operations and comprehensive loss (in thousands):

	Year Ended December 31,	
	2019	2018
Research and development expense	$ 2,425	$ 1,661
General and administrative expense	5,547	3,550
	$ 7,972	$ 5,211

Equity-based compensation during the year ended December 31, 2019 includes $0.6 million and $0.1 million related to the acceleration and modification, respectively, of certain equity awards. Equity-based compensation during the year ended December 31, 2018 includes $1.2 million related to the modification of certain other equity awards.

Restricted Stock

The following table summarizes restricted common stock activity as of December 31, 2019:

	Number of Shares	Weighted Average Fair Value per Share at Issuance
Restricted common stock as of December 31, 2018	664,174	$ 5.77
Granted	—	$ —
Vested	(357,604)	$ 5.77
Forfeited	(4,210)	$ 5.77
Restricted common stock as of December 31, 2019	302,360	$ 5.77

As of December 31, 2019, the Company had unrecognized equity-based compensation expense of $1.3 million related to restricted stock issued to employees and directors, which is expected to be recognized over a period of 1.2 years.

Stock Options

The following table summarizes the Company's stock option activity as of December 31, 2019:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding as of December 31, 2018	1,627,947	$ 10.86	9.26	$ 19,831
Granted	1,034,825	$ 15.07		
Exercised	(129,431)	$ 7.06		
Cancelled	(131,959)	$ 15.46		
Outstanding as of December 31, 2019	2,401,382	$ 12.63	8.36	$ 6,523
Options exercisable as of December 31, 2019	787,537	$ 11.17	7.40	$ 2,902

Using the Black-Scholes option pricing model, the weighted average fair value of options granted to employees and directors during the year ended December 31, 2019 was $10.53.

The following assumptions were used in determining the fair value of options granted in the year ended December 31, 2019:

Risk-free interest rate	2.31 %
Expected dividend yield	0.0 %
Expected term (years to liquidity)	6.20
Expected volatility	79.50 %

As of December 31, 2019, the Company has unrecognized equity-based compensation expense related to its employee stock options of $13.8 million which the Company expects to recognize over the remaining weighted-average vesting period of 2.6 years.

11. Income Taxes

The Company has not recorded a current or deferred tax provision for the years ended December 31, 2019 and 2018.

The effective income tax rate differed from the amount computed by applying the federal statutory rate to the Company's loss before income taxes as follows:

	For Year Ended December 31,	
	2019	2018
Tax effected at statutory rate	21.0 %	21.0 %
State taxes	7.2	6.6
Stock compensation	(1.7)	(1.7)
Non deductible expenses	(0.4)	(0.1)
Federal research and development credits	7.8	5.9
Change in valuation allowance	(33.9)	(31.7)
	— %	— %

Deferred tax assets (liabilities) consist of the following at December 31, 2019 and 2018 (in thousands):

	As of December 31,	
	2019	2018
Deferred tax assets:		
Reserve and accruals	$ 1,704	$ 1,031
Net operating loss carryforwards	26,932	25,380
Deferred rent	—	242
Operating lease liability	1,448	—
Deferred revenue	13,173	3,525
Tax credits	9,569	4,976
Stock based compensation	1,049	314
Total gross deferred tax assets	53,875	35,468
Valuation allowance	(52,260)	(34,970)
Total deferred tax assets	1,615	498
Total deferred tax liabilities:		
Operating lease right-of-use asset	(1,214)	—
Fixed and intangible assets	(401)	(498)
Total deferred tax liabilities	(1,615)	(498)
Total net deferred tax assets	$ —	$ —

Total Net Deferred Tax Assets

Deferred tax assets are reduced by a valuation allowance if, based on the weight of available positive and negative evidence, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Accordingly, a full valuation allowance has been established against the net deferred tax assets as of December 31, 2019 and 2018. The valuation allowance for deferred tax assets increased by $17.3 million and $19.2 million in 2019 and 2018, respectively. This increase mainly relates to the establishment of a valuation allowance against the Company's net domestic deferred tax assets in connection with net operating losses generated in each year and the recording of additional net operating losses and credit carryforwards, partially offset by a revaluation of the federal deferred tax assets in 2018 based on the tax law change. As of December 31, 2019, the Company had approximately $98.1 million and $100.1 million of Federal and State operating loss carryforwards respectively, which begin to expire in 2032. The Company also had federal net operating loss carryforwards of $47.6 million that do not expire. These loss carryforwards are available to reduce future taxable income, if any. These loss carryforwards are subject to review and possible adjustment by the appropriate taxing authorities. As of December 31, 2019, the Company also had federal and state credit carryovers of $8.0 million and $2.0 million, respectively. The amount of loss and credit carryforwards that may be utilized in any future period may be limited based upon changes in the ownership of the Company's ultimate parent. Additionally, the deductibility of federal net operating losses generated after December 31, 2017 is limited to 80% of the Company's taxable income in any future taxable year.

The Company follows the provisions of ASC 740-10, "Accounting for Uncertainty in Income Taxes," which specifies how tax benefits for uncertain tax positions are to be recognized, measured, and recorded in financial statements; requires certain disclosures of uncertain tax matters; specifies how reserves for uncertain tax positions should be classified on the balance sheet; and provides transition and interim period guidance, among other provisions. As of December 31, 2019 and 2018, the Company has not recorded any amounts for uncertain tax positions. The Company's policy is to recognize interest and penalties accrued on any uncertain tax positions as a component of income tax expense, if any, in its statements of income.

12. Commitments and Contingencies

Operating Leases

620 Memorial Facility Lease

In March 2015, the Company entered into a 5-year facility lease for its corporate headquarters (the "lease") at 620 Memorial Drive in Cambridge, Massachusetts. The lease was amended in February 2018, to add an additional space (the "expansion space") at the current location and to extend the lease term (the "amended lease"). The amended lease expires in September 2023. Rent for the facility lease, including the expansion space, increases from $1.4 million a year to $1.7 million a year over the term of the lease. Variable lease payments include the Company's allocated share of costs incurred and expenditures made by the landlord in the operation and management of the building. The Company has the option to extend the term of the amended lease for one additional term of 5 years commencing after the amended lease expires.

Other information related to the Company's lease is as follows (in thousands, except lease term and discount rate):

	For Year Ended December 31, 2019
Lease Cost:	
Operating lease cost	$ 1,375
Variable lease cost	674
Total lease cost	$ 2,049

	For Year Ended December 31, 2019
Other information:	
Operating cash flows used for operating leases	$ 1,266
Weighted average remaining lease term	3.75 years
Weighted average incremental borrowing rate	6.47 %

The following is a maturity analysis of the annual undiscounted cash flows reconciled to the carrying value of the operating lease liabilities as of December 31, 2019 (in thousands):

Year Ending December 31,	
2020	$ 1,446
2021	1,619
2022	1,668
2023	1,279
Total lease payments	6,012
Less imputed interest	(709)
Total operating lease liabilities	$ 5,303

The Company recorded approximately $1.4 million and $1.0 million in rent expense for the years ended December 31, 2019 and 2018, respectively.

301 Binney Facility Lease

In November 2019, the Company entered into a facility lease at 301 Binney Street in Cambridge, Massachusetts to be used as its new corporate headquarters. The Company is involved in the construction and design of the space and anticipates that it will incur construction costs, subject to an allowance for tenant improvements of up to $14.1 million. No construction costs have been incurred as of December 31, 2019. The expiration date of the lease is in August 2025 and the Company has the option to extend the term by two years. The base rent is $6.9 million per year, subject to an increase of 3.5%, and the Company is subject to a free-rent period through mid-August 2020. Variable lease payments include the Company's allocated share of costs incurred and expenditures made by the landlord in the operation and management of the building. In connection with the facility lease, the Company has secured a letter of credit for $2.3 million which renews automatically each year. The lease commencement date, for accounting purposes, was not reached as of December 31, 2019 and therefore the lease is not included in the Company's operating lease right-of-use asset or operating lease liabilities as of December 31, 2019.

Legal Proceedings

The Company, from time to time, may be party to litigation arising in the ordinary course of its business. The Company was not subject to any material legal proceedings during the years ended December 31, 2019 and 2018.

13. Loan Payable

In August 2015, the Company entered into a Loan and Security Agreement with Silicon Valley Bank ("SVB"), which provided the Company an equipment line of credit of up to $2.0 million to finance the purchase of eligible equipment, which the Company borrowed the full $2.0 million against the line of credit. The loan balance at December 31, 2018 was $0.4 million. The Company made the final payments on the loan in June 2019.

For the years ended December 31, 2019 and 2018, the Company recorded total interest expense for this loan of $27,000 and $0.1 million, respectively.

14. Agreements

Collaboration with Gilead

Agreement Summary

On December 19, 2018 (the "Effective Date"), the Company entered into a Master Collaboration Agreement (the "Gilead Collaboration Agreement") with Gilead to discover and develop specific inhibitors of TGFβ activation focused on the treatment of fibrotic diseases. Under the collaboration, Gilead has exclusive options to license worldwide rights to product candidates that emerge from three of the Company's TGFβ programs (each a "Gilead Program"). Pursuant to the Gilead Collaboration Agreement, the Company is responsible for antibody discovery and preclinical research through product candidate nomination, after which, upon exercising the option for a Gilead Program, Gilead will be responsible for the program's preclinical and clinical development and commercialization. Such option may be exercised by Gilead at any time from the Effective Date through a date that is 90 days following the expiration of the Research Collaboration Term (as defined below) for a given Gilead Program, or until termination of the Gilead Program, whichever is earlier (the "Option Exercise Period").

The Company received a non-refundable upfront payment of $50 million under the Gilead Collaboration Agreement. If Gilead exercises its option to exclusively license a Gilead Program, the Company may earn a total potential aggregate option exercise fee, development, regulatory and commercial milestone payments with respect to each Gilead Program of $475 million, or a total of $1,425 million across all three Gilead Programs. Additionally, in partial consideration of the rights granted to Gilead pursuant to the License Agreement, Gilead shall pay to the Company certain tiered royalties at a rate ranging from the high single-digits to the low double-digits (depending on the amount of net sales) on each

Licensed Product in a given calendar year, on a country-by-country basis. In December 2019, the Company achieved a $25 million preclinical milestone for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies. None of the payments under the Gilead Collaboration Agreement are refundable.

Simultaneously with the entry into the Gilead Collaboration Agreement, the Company entered into a Share Purchase Agreement with Gilead (the "Gilead Equity Agreement"). Pursuant to the terms of the Gilead Equity Agreement, Gilead purchased 980,392 shares of common stock of the Company (the "Shares") at a purchase price of $30.60 per share, for an aggregate purchase price of $30 million. The Company did not incur any material costs in connection with the issuance of the Shares.

The Company and Gilead have established a joint steering committee (the "JSC"). The JSC, among other powers and responsibilities, reviews, oversees and has decision-making responsibilities for certain strategic activities performed under the Gilead Programs, including reviewing and amending the research plans, reviewing any development candidate nominations, selecting a development candidate, and overseeing the strategic direction of the Gilead Programs. The Company conducts its activities for each Gilead Program under the Gilead Collaboration Agreement, on a program-by-program basis, during the period beginning on the Effective Date and ending on the earliest to occur of (a) the date that the JSC first approves a selected development candidate for such program, (b) the third anniversary of the Effective Date, or (c) the effective date of termination of the Gilead Collaboration Agreement (the "Research Collaboration Term"). During the Research Collaboration Term, for each Gilead Program, the Company will notify Gilead, through the JSC, of up to two Gilead Program antibodies (in the case that Gilead rejects one, in accordance with the terms of the Gilead Collaboration Agreement) that satisfy the development criteria for such program (the "Development Candidate Nomination").

The Gilead Collaboration Agreement remains in effect, unless otherwise earlier terminated in accordance with the terms of the Gilead Collaboration Agreement, on a program-by-program basis, until Gilead exercises its option with respect to a given Gilead Program or until expiration of the applicable Option Exercise Period, whichever is earlier (the "Term"). Unless earlier terminated, the Term shall expire in its entirety upon the expiration of the last to expire Option Exercise Period under the Gilead Collaboration Agreement. Gilead may terminate the Gilead Collaboration Agreement in its entirety or on a program-by-program basis in its sole discretion upon prior written notice to the Company pursuant to the terms of the agreement. The Gilead Collaboration Agreement may also be terminated on a program-by-program basis by either party in the event of an uncured material breach of the Gilead Collaboration Agreement by the other party.

Prior to Gilead's exercise of an option, the Company has the lead responsibility for drug discovery and pre-clinical development of all Gilead Programs through to Development Candidate Nomination. Within a certain period of time after receiving a data package for a Development Candidate Nomination, Gilead may exercise its option to enter into a Form of License Agreement for exclusive rights to develop, manufacture and commercialize the licensed antibodies and licensed products of such Gilead Program.

Accounting Treatment

The Company assessed this arrangement in accordance with ASC 606 and concluded that the contract counterparty, Gilead, is a customer. The Company identified the following material promises under the arrangement: (1) the non-exclusive, royalty-free research and development license; (2) the research and development services for the Gilead Programs; and (3) the options to license each of the three Gilead Programs to develop, manufacture and commercialize licensed candidates and resulting products, which were determined to be material rights for each Gilead Program. The research and development services for each of the three Gilead Programs were determined to not be distinct from the research and development license and have been combined into a single performance obligation for each Gilead Program. Additionally, the option and associated material right for each Gilead Program represent separate performance obligations. The promises under the Gilead Collaboration Agreement relate primarily to the research and development required by the Company for each of the Gilead Programs nominated by Gilead. The Company does not have significant responsibilities subsequent to Gilead's exercise of each option.

At the commencement of the arrangement, two units of accounting were identified: the issuance of 980,392 of the Company's common shares and the joint research activities during the three-year research collaboration term. The Company determined the total transaction price to be $80 million, consisting of $17.1 million attributed to the equity sold to Gilead and $62.9 million attributed to the joint research activities. In determining the fair value of the common stock at closing, the Company considered the closing price of the common stock at the time of the transaction and included a lack of marketability discount because the shares were subject to certain restrictions. Of the $30 million

equity investment, $12.9 million was determined to be a premium and therefore was included as part of the transaction price to be allocated over the performance obligations. At the commencement of the arrangement, the $25 million milestone for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies was not included in the transaction price. The Company will reevaluate the transaction price at the end of each reporting period and as uncertain events are resolved or other changes in circumstances occur, and, if necessary, will adjust its estimate of the transaction price. The $62.9 million attributed to the joint research activities was allocated to the performance obligations based on their standalone selling prices (the "SSP") when the Gilead Collaboration Agreement was executed. The Company made certain estimates when determining the SSP. For the research licenses and related research and development services, the estimated SSP is primarily based on the nature of the services to be performed and estimates of the associated effort and costs of the services. The Company developed the estimated SSP for the material rights based on the intrinsic value of the license upon exercise of the underlying option, industry standards for product development and estimates for the likelihood of option exercise.

The consideration related to the underlying options will not be included in the transaction price until the options are exercised. Additionally, the subsequent potential development, regulatory and commercial milestones are excluded from the transaction price, until after Gilead exercises its respective options.

Revenue associated with the research and development and license performance obligations relating to the Gilead Programs is recognized as revenue as the research and development services are provided using an input method, according to the costs incurred on each Gilead Program and the costs expected to be incurred in the future to satisfy the performance obligation. The transfer of control occurs over time. In management's judgment, this input method is the best measure of progress towards satisfying the performance obligation. The amounts allocated to the three material rights will be recognized when Gilead exercises each respective option and delivers the underlying license and transfer of know-how, or immediately as each option expires unexercised. The amounts received that have not yet been recognized as revenue are recorded in deferred revenue on the Company's consolidated balance sheet.

None of the performance obligations have been fully satisfied as of December 31, 2019. A $25 million preclinical milestone was achieved in December 2019 for the successful demonstration of efficacy in preclinical *in vivo* proof-of-concept studies. As a result, the associated $25 million was included in the consideration transferred and proportionally allocated to the performance obligations, as it was probable that a future material reversal will not occur.

In 2019, the Company recognized $20.5 million in revenue under the Gilead Collaboration Agreement, of which $14.7 million was included in the deferred revenue balance at the beginning of the period. The aggregate amount of the transaction price allocated to the Company's unsatisfied performance obligations and recorded in deferred revenue at December 31, 2019 is $67.4 million. The Company will recognize the deferred revenue related to the research and development services based on a cost input method, over the remaining research term for each respective Gilead Program, which is a maximum of 2 years as of December 2019; each research term is dependent on the timing of Gilead either exercising its options for the Gilead Programs or terminating further development on the Gilead Programs prior to the expiration date of the research term.

15. Net Loss per Share

The Company calculates basic net loss per share by dividing net loss by the weighted average number of common shares outstanding, excluding restricted common stock. The Company has generated a net loss in all periods presented, so the basic and diluted net loss per share are the same, as the inclusion of the potentially dilutive securities would be anti-dilutive.

Basic and diluted net loss per share is calculated as follows (in thousands, except share and per share data):

	Year Ended December 31, 2019	Year Ended December 31, 2018
Net loss	$ (51,000)	$ (49,326)
Weighted average common shares outstanding, basic and diluted	27,537,939	15,655,293
Net loss per share, basic and diluted	$ (1.85)	$ (3.15)

The following table sets forth the outstanding common stock equivalents, presented based on amounts outstanding at each period end, that have been excluded from the calculation of diluted net loss per share for the periods indicated because their inclusion would have been anti-dilutive:

	Year Ended December 31,	
	2019	2018
Restricted common stock	302,360	664,174
Warrant	7,614	7,614
Stock options	2,401,382	1,627,947
	2,711,356	2,299,735

16. Retirement Plan

The Company sponsors a 401(K) retirement plan, in which substantially all employees are eligible to participate upon employment. Participants may contribute a percentage of their annual compensation to this plan, subject to statutory limitations. The Company did not provide any contributions to this plan during the years ended December 31, 2019 and 2018.

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

1. Registration Statement (Form S-3 No. 333-231920) of Scholar Rock Holding Corporation, and

2. Registration Statement (Form S-8 No. 333-225192) pertaining to the equity incentive plan of Scholar Rock Holding Corporation;

of our report dated March 12, 2020, with respect to the consolidated financial statements of Scholar Rock Holding Corporation, included in this Annual Report (Form 10-K) of Scholar Rock Holding Corporation for the year ended December 31, 2019.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 12, 2020

Exhibit 31.1

Certifications

I, Nagesh K. Mahanthappa, certify that:

1. I have reviewed this Annual Report on Form 10-K of Scholar Rock Holding Corporation;

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)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer 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 12, 2020

/s/ Nagesh K. Mahanthappa

Nagesh K. Mahanthappa
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

Certifications

I, Erin Moore, certify that:

1. I have reviewed this Annual Report on Form 10-K of Scholar Rock Holding Corporation;

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)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer 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 12, 2020

/s/ Erin Moore

Erin Moore
Senior Vice President, Finance
(Principal Accounting Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO

18 U.S.C. SECTION 1350

AS ADOPTED PURSUANT TO

SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Scholar Rock Holding Corporation (the "Company") for the year ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of the Company certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to his or her knowledge, that:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d), as applicable, 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.

This certification is being provided pursuant to 18 U.S.C. 1350 and is not to be deemed a part of the Report, nor is it to be deemed to be "filed" for any purpose whatsoever.

Date: March 12, 2020

/s/ Nagesh K. Mahanthappa
Nagesh K. Mahanthappa
President and Chief Executive Officer

Date: March 12, 2020

/s/ Erin Moore
Erin Moore
Senior Vice President, Finance

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Management Team

Nagesh K. Mahanthappa, PhD, MBA
Chief Executive Officer & President

Yung H. Chyung, MD
Chief Medical Officer

Alan J. Buckler, PhD
Chief Scientific Officer

Gregory J. Carven, PhD
Senior Vice President, Biologics

Heather Faulds
Senior Vice President, Regulatory Sciences & Quality

Junlin Ho, JD
Senior Vice President, Head of Legal and Corporate Secretary

Ryan Iarrobino
Senior Vice President, Clinical Development & Operations

Erin Moore
Senior Vice President, Finance

Lisa Amaya Price
Senior Vice President, Human Resources

Dodzie Sogah, PhD
Senior Vice President, Corporate Development & Strategy

Board of Directors

David Hallal
Chairman of the Board of Directors, Scholar Rock®
CEO of ElevateBio
CEO of AlloVir

Kristina Burow
Managing Director, ARCH Venture Partners

Jeffrey S. Flier, MD
Harvard University Distinguished Service Professor and George Higginson Professor of Physiology and Medicine at Harvard Medical School
Former Dean of Harvard Medical School

Michael Gilman, PhD
CEO, Arrakis Therapeutics

Nagesh K. Mahanthappa, PhD, MBA
CEO & President, Scholar Rock®

Edward (Ted) Myles, MBA
COO and CFO of AMAG Pharmaceuticals

Amir Nashat, PhD
Managing General Partner, Polaris Venture Partners

Akshay Vaishnaw, MD, PhD
President, R&D of Alnylam Pharmaceuticals

Annual Meeting of Stockholders

The Annual Meeting of Stockholders will be held by virtual meeting only at 9:00AM, EDT on May 29, 2020 and can be accessed from the following website:

https://www.virtualshareholdermeeting.com/SRRK2020.
You may attend the meeting via the Internet by logging in with your 16-digit control number.

Independent Auditors

Ernst & Young, LLP

Investor Inquiries

ir@scholarrock.com

Stock Listing

NASDAQ: SRRK

Transfer Agent

Computershare
P.O. Box 505000
Louisville, KY 40233-5000
(800) 736-3001

SEC Form 10-K

A copy of our Form 10-K filed with the Securities and Exchange Commission (SEC) is available free of charge on the SEC's website at **www.sec.gov** or from the company's investor relations department by calling **857-259-3860**, emailing **ir@scholarrock.com** or sending a written request to Scholar Rock's investor relations department at:

Investor Relations
Scholar Rock
620 Memorial Drive, 2nd Floor
Cambridge, MA 02139

Change is coming!

Take a sneak peek at our **new look.**

Confronting convention

We take risks and challenge the status quo because disease must be fought with **unexpected practice.**

ScholarRock

A new brand to match our novel science.

We're evolving our visual identity and messaging to reflect our barrier-breaking work and growing, exceptional team.