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

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2020

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: 001-38853

NGM BIOPHARMACEUTICALS, INC.
(Exact name of Registrant as specified in its charter)

Delaware	**26-1679911**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

333 Oyster Point Boulevard
South San Francisco, California 94080
(Address of principal executive offices and zip code)
Registrant's telephone number, including area code: (650) 243-5555
Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class of Securities Registered	Trading Symbol	Name of Each Exchange on Which Registered
Common Stock, par value $0.001 per share	NGM	The Nasdaq Stock Market LLC

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

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

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

Indicate by check mark whether the 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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

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

The aggregate market value of the registrant's common stock held by non-affiliates of the registrant as of June 30, 2020, the last business day of the registrant's most recently completed second fiscal quarter, was approximately $457 million, calculated based on the closing price of the registrant's common stock as reported by the Nasdaq Global Select Market. Excludes an aggregate of 45,585,585 shares of the registrant's common stock held as of such date by officers, directors and stockholders that the registrant has concluded are or were affiliates of the registrant. Exclusion of such shares should not be construed to indicate that the holder of any such shares possesses the power, direct or indirect, to direct or cause the direction of the management or policies of the registrant or that such person is controlled by or under common control with the registrant.

As of March 10, 2021, the number of outstanding shares of the registrant's common stock, par value $0.001 per share, was 76,692,401.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the 2021 Annual Meeting of Stockholders to be filed with the U.S. Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K are incorporated by reference in Part III, Items 10-14 of this Annual Report on Form 10-K.

NGM BIOPHARMACEUTICALS, INC.
2020 ANNUAL REPORT ON FORM 10-K
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Unless the context suggests otherwise, references in this Annual Report on Form 10-K (the "Annual Report") to "us," "our," "NGM," "NGM Biopharmaceuticals," "we," the "Company" and similar designations refer to NGM Biopharmaceuticals, Inc. and, where appropriate, its subsidiary.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements that involve risks, uncertainties and assumptions that, if they never materialize or prove incorrect, could cause our results to differ materially from those expressed or implied by such forward-looking statements. The statements contained in this Annual Report on Form 10-K that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Forward-looking statements are often identified by the use of words such as, but not limited to, “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would” or the negative of those terms, and similar expressions that convey uncertainty of future events or outcomes to identify these forward-looking statements. Any statements contained herein that are not statements of historical facts may be deemed to be forward-looking statements. Forward-looking statements in this Annual Report include, but are not limited to, statements about:

- the success, cost and timing of our product development activities and clinical trials and those of our collaboration partner, Merck Sharp & Dohme Corp., or Merck, and the initiation of, enrollment in, availability of data for and other events related to such clinical trials;
- whether, when or on what terms Merck will exercise, if at all, its option to extend the research phase under our research collaboration, product development and license agreement with Merck, or the Collaboration Agreement, and whether or when, if at all, we will reach agreement with Merck on the terms of a modified collaboration generally;
- the level of future research and other funding under the Collaboration Agreement, the possibility that Merck will designate any of our product candidates for further development at the end of the research phase of the collaboration and the possibility that Merck will decide to exercise any of its options to license certain programs upon completion of a proof-of-concept study in humans;
- our and Merck’s ability to obtain and maintain regulatory approvals for aldafermin, MK-3655, NGM621, NGM120, NGM707, NGM438 and any of our future product candidates, and any related restrictions, limitations and/or warnings in the label of an approved product candidate;
- our belief that aldafermin may have the potential to be a treatment for non-alcoholic steatohepatitis, or NASH, patients with moderate to advanced fibrosis;
- our belief regarding the impact of our product candidate side effects and our ability to effectively manage these side effects;
- our belief that MK-3655 may have the potential to be a treatment for patients with NASH with early to moderate fibrosis;
- our ability to obtain funding for our operations;
- the commercialization of our product candidates, if approved;
- our plans to research, develop and commercialize our product candidates;
- our ability to attract additional collaborators with development, regulatory and commercialization expertise;
- current and future agreements with third parties in connection with the potential commercialization of aldafermin, MK-3655, NGM621, NGM120, NGM707, NGM438 or any other future approved product;
- the size and growth potential of the markets for our product candidates, and our ability to serve those markets;
- the rate and degree of market acceptance of our product candidates, as well as the reimbursement coverage for our product candidates;
- our beliefs with respect to the availability of the accelerated approval pathway for any marketing applications that we and/or Merck may submit to the U.S. Food and Drug Administration, or FDA;
- the performance of, and our ability to obtain sufficient supply of clinical trial material in a timely manner from, third-party suppliers and manufacturers;
- the success of competing therapies that are or may become available;
- our ability to attract and retain key scientific, development and management personnel;
- our estimates regarding future expenses, revenue, capital requirements and needs for additional financing, particularly in light of our ongoing negotiations with Merck on the terms of a modified collaboration, following which we expect that, after the end of the current research phase, the level of annual research support Merck may provide will be meaningfully lower than the annual research support

Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase;
- our expectations regarding the period during which we qualify as an emerging growth company under the Jumpstart Our Business Startups Act of 2012, as amended, or JOBS Act; and
- our expectations regarding our ability to obtain, maintain, protect and enforce intellectual property protection for our product candidates.

RISK FACTOR SUMMARY

Below is a summary of material factors that make an investment in our common stock speculative or risky. Importantly, this summary does not address all of the risks and uncertainties that we face. Additional discussion of the risks and uncertainties summarized in this risk factor summary, as well as other risks and uncertainties that we face, can be found under "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K. The below summary is qualified in its entirety by that more complete discussion of such risks and uncertainties. You should carefully consider the risks and uncertainties described under "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K as part of your evaluation of an investment in our common stock.

- our most advanced product candidate, aldafermin, is still only in Phase 2 development and may fail to demonstrate safety and efficacy in ongoing and future clinical trials, may never achieve regulatory approval and may not be able to be successfully commercialized due to competition or other factors;
- similarly, clinical trials of our other product candidates may fail to produce positive results or to demonstrate safety and efficacy to the satisfaction of regulatory authorities;
- aldafermin and MK-3655 are being developed for the treatment of NASH, an indication for which there are no approved products, which makes it difficult to predict the timing, cost and potential success of their clinical development and regulatory approval for the treatment of NASH;
- we have incurred net losses every year since our inception, we have no source of product revenue, we expect to continue to incur significant and increasing operating losses and we may never become profitable;
- we do not know whether Merck will elect to extend the research phase of our collaboration and the level of research funding support we may obtain during any such extension or whether we may otherwise be able to reach agreement with Merck on the terms of a modified collaboration, and regardless of whether we and Merck reach agreement on the terms of a modified collaboration, our collaboration with Merck involves numerous risks, any of which could materially and adversely affect our business and financial condition;
- we currently depend on our collaboration with Merck, and in the future may depend on collaborations with additional third parties, for the development and commercialization of our product candidates;
- we will require additional capital to finance our operations, which may not be available to us on acceptable terms, or at all, and as a result, we may not have the resources to complete the development and commercialization of our current and potential future product candidates;
- we will need to successfully complete rigorous preclinical and clinical testing of our product candidates before we can seek regulatory approval, which could delay or prevent commercialization of our product candidates;
- we may not successfully identify new product candidates to expand our development pipeline;
- the process of manufacturing aldafermin and our other biologic product candidates is complex, highly regulated and subject to many manufacturing risks, including difficulties in production, particularly in scaling up and validating initial production and ensuring the avoidance of contamination, any of which could substantially increase our costs and limit supply of our product candidates and any future products needed for clinical trials and commercialization;
- the regulatory approval processes of the FDA and comparable foreign regulatory authorities are lengthy, time-consuming and inherently unpredictable;

- our future success depends in part on our ability to attract and retain highly skilled employees, including members of our current senior management team, especially Dr. Jin-Long Chen;
- the COVID-19 pandemic continues to adversely impact our business and could materially and adversely affect our operations, as well as the businesses or operations of our manufacturers, clinical research organizations or other third parties with whom we conduct business;
- we face substantial competition, which may result in others discovering, developing or commercializing products before, or more successfully than, us;
- our success depends in significant part upon our ability to obtain and maintain intellectual property protection for our products and technologies;
- our principal stockholders, including entities affiliated with The Column Group, Merck and our management, own a substantial percentage of our stock and will be able to exert significant control over matters subject to stockholder approval;
- we may not be able to obtain and maintain the relationships with third parties that are necessary to develop, manufacture and commercialize some or all of our product candidates;
- we or third parties we rely on could experience a cybersecurity incident that could harm our business; and
- the market price of our common stock has been and may continue to be volatile, and you could lose all or part of your investment.

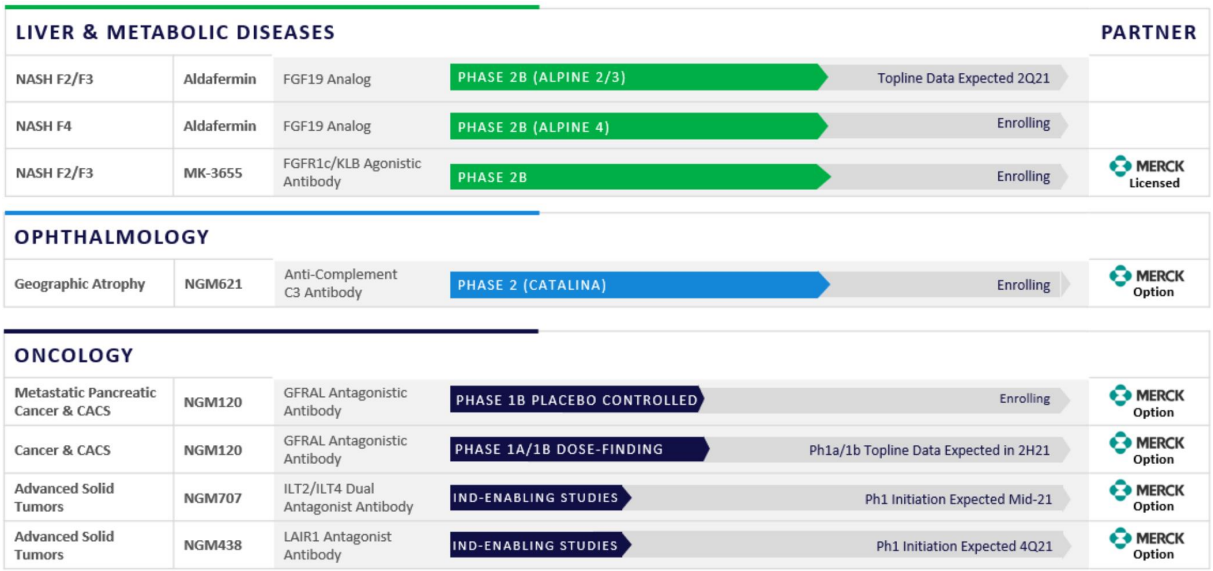
PART I

Item 1. Business.

Overview of Our Business

We are a biopharmaceutical company focused on discovering and developing novel therapeutics based on scientific understanding of key biological pathways underlying liver and metabolic diseases, retinal diseases and cancer. These diseases represent a significant burden for patients and healthcare systems and, in some cases, are leading causes of morbidity and mortality. Since the commencement of our operations in 2008, we have generated a robust portfolio of product candidates in various stages of active development ranging from early discovery to late-stage development. We aspire to operate one of the most productive research and development engines in the biopharmaceutical industry.

Our most advanced product candidate, aldafermin (formerly NGM282), is wholly-owned by us and is in Phase 2b development for the treatment of patients with non-alcoholic steatohepatitis, or NASH, with liver fibrosis stage 2, 3 or 4, or F2, F3 or F4. Two additional product candidates we discovered are in Phase 2 or Phase 2b trials: MK-3655 for the treatment of NASH and NGM621 for the treatment of geographic atrophy, or GA. In addition, our growing oncology portfolio includes NGM120, which is in a Phase 1b placebo controlled-study for the treatment of cancer anorexia/cachexia syndrome, also referred to as cancer-related cachexia or CACS, and for the treatment of cancer, and two recently announced novel immunotherapies to treat cancer, NGM707 and NGM438, which are in preclinical investigational new drug application-, or IND-, enabling studies. We have additional undisclosed programs that are in various stages of development ranging from functional validation to preclinical development. Our six most advanced product candidates and their stages of development are presented below:



FGF = fibroblast growth factor; FGFR1c/KLB = fibroblast growth factor receptor 1c-beta-klotho; C3 = Component 3; CACS= cancer anorexia-cachexia syndrome; GFRAL = glial cell-derived neurotrophic factor receptor alpha-like; ILT2 = Immunoglobulin-like transcript 2; ILT4 = Immunoglobulin-like transcript 4; LAIR1 = Leukocyte-associated immunoglobulin-like receptor 1

For more detailed information about our product candidate pipeline and targeted therapeutic areas, see “Key Therapeutic Areas and Our Pipeline Programs” below.

Our Strategy

We have generated our diverse portfolio of programs using our in-house drug discovery engine that employs unbiased, systematic interrogation of complex disease-associated biology to uncover novel mechanisms of action and to identify proprietary insights into critical biological processes. Leveraging these insights, we deploy our protein and antibody engineering expertise to create highly targeted product candidates that modulate the signal we have identified and to enhance each product candidate's therapeutic potential. We use this combination of interrogating human biology and engineering powerful biologics to discover and develop promising product candidates and seek to move them rapidly into proof-of-concept studies and late-stage development, with the goal of delivering impactful first-in-class or best-in-class treatments to underserved patients suffering from grievous diseases.

Key elements of our strategy are:

- **Systematically and empirically interrogate complex disease-associated biology.** We pursue drug discovery and development through a multi-step process geared towards translating powerful human biology into first-in-class medicines. This process seeks to address the challenges in drug discovery in diseases that involve complex, integrated biological pathways.

- **Remain biologics-focused, but modality flexible, leveraging a versatile biologics platform to design unique solutions for complex problems.** Our process pairs a research approach that generates novel insights into pathways demonstrating powerful biological effect with the expertise in protein and antibody engineering to transform those insights into product candidates. We have an unbiased antibody generation approach and use a wide spectrum of modalities and technologies to optimize the properties of our antibody product candidates and native proteins.

- **Follow a multi-pronged therapeutic area approach that is informed by biological insights.** Our research areas of focus span the biology of liver and metabolic diseases, retinal diseases and cancer. Our collaboration with Merck Sharp & Dohme Corp., or Merck, has created an incentive for us to develop multiple candidates through human proof-of-concept studies but does not limit the therapeutic areas that we can explore. This enables us to develop multiple, diverse programs simultaneously.

- **Build a diversified pipeline, honed with disciplined prioritization.** We have built a broad and diversified portfolio with six publicly-disclosed product candidates, each covering different targets, in various stages of active development in three therapeutic areas. We seek to allocate our capital efficiently and strategically and fund our portfolio based on each program's scientific and other merits. We are constantly evaluating our current as well as potential programs competing for resources. Our discipline has been demonstrated by the suspension of development activities on multiple product candidates in order to concentrate our resources on what we consider our most promising product candidates.

- **Recruit and retain industry-leading research and development talent.** We have an experienced and talented team of scientists and drug developers who use their capabilities in discovery sciences, protein and antibody engineering, pharmacology, translational medicine and preclinical and clinical development to discover and develop innovative therapeutics in house. We aim to attract outstanding professionals necessary to sustain and enhance our scientific excellence, rigor and innovation, our creative clinical development and our high level of productivity.

- **Leverage our collaboration with Merck and pursue other collaborations with strategic partners when beneficial to advance development and commercialize any approved products.** Partnering has been and is expected to continue to be a key component of our strategy as we plan to continue to develop a broad portfolio of product candidates and, if approved, to commercialize the resulting products alone or with partners. As described in more detail below, our existing collaboration with Merck has to date provided us with substantial financial support and we are currently in discussions with Merck with respect to modifying certain terms of the collaboration. For any programs wholly-owned by us and not subject to the Merck collaboration, such as aldafermin, we may decide to pursue a strategic partner to progress, in whole or in part, the program or commercialize any resulting approved product.

Our Merck Collaboration

In 2015, we entered into a broad, strategic collaboration with Merck in order to advance novel biologic therapeutics for the treatment of diseases with significant unmet medical needs. Since that time, the Merck collaboration has provided us with robust financial support to broaden and accelerate our existing research efforts, while allowing us to retain our research independence, together with the opportunity to retain meaningful economic rights in any collaboration product candidate Merck elects to advance. For such product candidates, the collaboration also currently allows us access to Merck's mid- and late-stage development expertise and the resources to enable large global trials, as well as the global commercial and distribution capabilities that we believe our products, if approved, will require. The collaboration to date has enabled us to develop more product candidates for major indications than we could likely have advanced on our own. The aldafermin program is not included in the Collaboration Agreement and it remains wholly-owned and controlled by us.

The original research phase of the collaboration was for five years. In March 2019, Merck exercised its option to extend the research phase of the collaboration through March 16, 2022. As part of the extension through March 16, 2022, Merck agreed to continue to fund our research and development efforts of up to $75.0 million each year consistent with the initial five-year term and, in lieu of a $20.0 million extension fee payable to us, Merck agreed to make additional payments totaling up to $20.0 million in support of our research and development activities during 2021 and in the first quarter of 2022.

Under the terms of the collaboration, Merck was required to notify us no later than March 17, 2021 of its unilateral decision whether to exercise its option to extend the research phase of the collaboration for an additional two-year term through March 16, 2024. In March 2021, Merck initiated discussions with us with respect to elements of the ongoing collaboration that might be optimized to better address the evolving interests and priorities of both NGM and Merck during the remainder of the current research phase through March 16, 2022 and during any extension of the current research phase and any tail period (which tail period is discussed below under "Our Collaboration with Merck"). In this regard, the parties are negotiating in good faith certain modifications to the terms of the collaboration. Such modifications may include, among other things, focusing NGM's research and development under the collaboration on therapeutic areas of particular interest to Merck, while enabling NGM to conduct research and development outside of these therapeutic areas which would, if mutually agreed to, allow NGM to discover and develop product candidates on its own or with third parties in other areas of interest. In order to allow negotiations to proceed, the parties have agreed to extend the March 17, 2021 deadline for Merck to deliver its extension notification decision until June 30, 2021. While we cannot predict whether or when Merck will elect to extend the research phase of the collaboration or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the current research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms.

Merck generally has a one-time right to exercise its option to an exclusive, worldwide license for any collaboration product candidate and related program when we or Merck complete a human proof-of-concept trial. In November 2018, Merck exercised its option to license MK-3655, an agonistic antibody selectively activating fibroblast growth factor receptor 1c-beta-klotho, or FGFR1c/KLB, which is a potential treatment for NASH. In November 2020, Merck initiated a Phase 2b randomized, double-blind study of MK-3655 in patients with NASH with F2 or F3 liver fibrosis. Under the current terms of the Collaboration Agreement, for a program that Merck licenses, such as MK-3655, we retain an option, when a product candidate has advanced to Phase 3 clinical trials, to participate in up to 50% of the economic return from that product candidate if it becomes an approved medicine by agreeing to share up to 50% of the costs of future development. If we do not elect this option, we will instead receive milestone and royalty payments and we will not be required to share in development costs.

For more detailed information about the Collaboration Agreement see “Our Collaboration with Merck” below as well as the sections titled “Risk Factors” in Part I, Item 1A of this Annual Report on Form 10-K and “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Overview of Our Business” in Part II, Item 7 of this Annual Report on Form 10-K.

COVID-19 Business Update

We are continuing to closely monitor the impact of the global COVID-19 pandemic on our business and have taken and continue to take proactive efforts designed to protect the health and safety of our patients, study investigators, clinical research staff and employees, while maintaining business continuity. Following guidance from federal, state and local authorities, we continue to operate with a primarily remote work model. Only individuals conducting essential in-person laboratory work and other essential business functions are working on site and only for work that cannot be conducted remotely. There have been relatively minor impacts on productivity overall, but future developments could more materially and adversely impact our productivity. In addition, in 2020, we experienced higher-than-normal employee turnover and an increased rate of hiring new employees. We cannot predict whether these trends will continue or be exacerbated, when we will be permitted to return to an office-based working model or whether we will be required to adopt a more restrictive work model.

We have experienced, from time to time, a slower pace of clinical trial site initiation and clinical trial enrollment and a higher dropout rate than originally anticipated in certain of our clinical trials. We have been proactively working to mitigate these and other effects of the COVID-19 pandemic by monitoring site initiations, patient enrollment and patient study adherence to provide support to patients and trial staff, often on a case-by-case and/or patient-by-patient basis. Most of our clinical trial sites, both within and outside of the United States, continue to screen patients in our clinical trials, and new patients are being enrolled when appropriate. While the COVID-19 pandemic has not yet resulted in a significant impact to our disclosed clinical development timelines, and we believe the higher-than-planned enrollment we achieved in our ALPINE 2/3 trial has mitigated the effects of the increased dropout rate, as the pandemic continues, there may be continuing negative impacts on our ability to initiate new clinical trial sites, maintain enrollment of existing patients and enroll new patients, which may result in increased clinical trial costs and negatively impact our timelines and our ability to obtain regulatory approvals of our product candidates in a timely fashion, if at all.

In addition, while we have not experienced any disruption to drug or related component supply for our ongoing clinical trials, we could experience disruptions to our supply chain and operations due to the continuing pandemic and associated delays in the manufacturing and supply of drug substance and drug product for our clinical trials, which could adversely affect our ability to conduct ongoing and future clinical trials of our product candidates. For example, our aldafermin drug product manufacturer has advised us that it could be required under orders of the U.S. government to allocate manufacturing capacity to the manufacture or distribution of COVID-19 vaccines. If any of our manufacturers become subject to acts or orders of U.S. or foreign government entities to allocate manufacturing capacity to the manufacture or distribution of COVID-19 vaccines or medical supplies needed to treat COVID-19 patients, this could also delay our clinical trials, perhaps substantially, particularly our ongoing and planned aldafermin trials, which could materially and adversely affect our business.

For information regarding the current and potential impacts of the effects of the COVID-19 pandemic on the conduct of our clinical trials and related development timelines and on our drug supply for our ongoing clinical trials, see the sections titled “Risk Factors” in Part I, Item 1A of this Annual Report on Form 10-K and “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Overview of Our Business” in Part II, Item 7 of this Annual Report on Form 10-K.

Key Therapeutic Areas and Pipeline Programs

Our discovery engine supports our ability to span multiple therapeutic areas. Currently our diverse pipeline of six product candidates can be divided into three therapeutic areas: liver and metabolic diseases, retinal diseases and oncology.

Therapeutic Area: Liver and Metabolic Diseases

We have spent the last decade discovering and developing a portfolio of clinical-stage drug candidates that target various forms of cardio-metabolic and liver diseases, most specifically NASH. We have identified

multiple hormonal pathways of interest and each of these drug candidates stem from novel insights we have made in the regulation of cardio-metabolic processes and liver function.

Our most advanced product candidate is aldafermin, a proprietary engineered analog of the human hormone fibroblast growth factor 19, or FGF19, which plays a critical role in controlling bile acid, lipid and glucose metabolism, and is administered through a once-daily subcutaneous injection. In clinical studies, aldafermin has demonstrated the ability to rapidly improve NASH and reverse liver fibrosis. Aldafermin is currently being studied in the ongoing Phase 2b ALPINE 2/3 trial in patients with NASH with F2 and F3 liver fibrosis, which completed enrollment in September 2020, and in the ongoing ALPINE 4 trial in patients with NASH with F4 liver fibrosis and well-compensated cirrhosis, which commenced enrollment in February 2020. We expect to report topline data from the ALPINE 2/3 trial in the second quarter of 2021. Aldafermin was excluded from the Collaboration Agreement at the inception of the collaboration and remains wholly-owned by NGM.

In this therapeutic area, Merck is developing MK-3655 which we discovered as part of the collaboration. MK-3655 is a proprietary agonistic antibody selectively activating fibroblast growth factor receptor 1c-beta-klotho, or FGFR1c/KLB, which regulates insulin sensitivity, blood glucose and liver fat. We believe MK-3655 has the potential to be a once-monthly injectable insulin sensitizer for the treatment of NASH. In November 2018, Merck exercised its option for a license to further research, develop and commercialize MK-3655 and other FGFR1c/KLB agonists pursuant to our Collaboration Agreement. Merck initiated the Phase 2b trial of MK-3655 in patients with NASH with F2 or F3 liver fibrosis in the fourth quarter of 2020 and is currently enrolling patients in that trial.

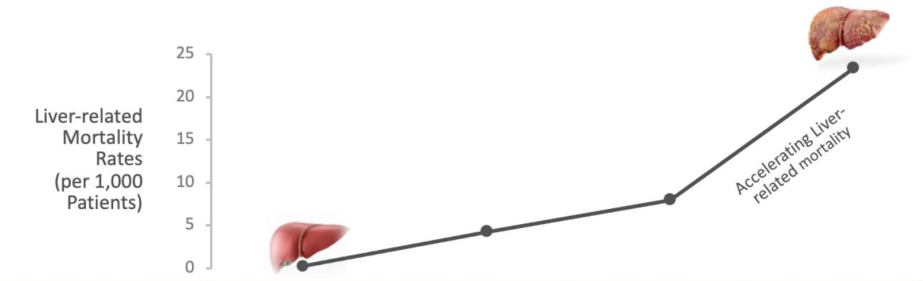
NASH Disease Overview

NASH and metabolic diseases are among the largest unmet medical needs globally and represent a leading cause of morbidity and mortality and a significant burden for patients and healthcare systems. They also represent areas of underinvestment by the pharmaceutical industry, driven in part by the biological complexity of the diseases and the substantial costs necessary to develop new therapeutics. Metabolic syndrome is exhibited by 34% of adults in the United States and comprises a constellation of co-morbid conditions, including type 2 diabetes, obesity, high blood pressure, poorly regulated lipids and non-alcoholic fatty liver disease, or NAFLD, a precursor to NASH. NAFLD is characterized by abnormal amounts of fat in the liver, a condition known as steatosis. This abnormal fat in the liver contributes to the progression in certain NAFLD patients to NASH by developing a necroinflammatory state in the liver that ultimately drives scarring, also known as fibrosis, and, for many, progresses to cirrhosis, liver cancer and liver failure.

Most patients with NASH are diagnosed in their forties or fifties; however, NASH develops across all ages, including in children. The development of NASH is thought to be linked to an increase in childhood obesity. Most patients with NASH are asymptomatic, although some may present with fatigue, malaise and vague right-upper quadrant abdominal discomfort. Patients are more likely to be initially identified by elevated liver aminotransferases on routine lab tests or hepatic steatosis detected incidentally on abdominal imaging. While non-invasive diagnostic tools are under development, a definitive diagnosis of NASH is currently only achievable through liver biopsy to assess the components of the NAFLD activity score, or NAS, and fibrosis stage (F0 to F4). The NAS is a validated score of liver histology that is used to grade disease activity in patients with NAFLD and NASH. The NAS is the sum of the liver biopsy's individual scores for steatosis (abnormal amounts of fat in the liver) (on scale of 0–3), lobular inflammation (chronic inflammatory infiltrate) (on a scale of 0–3) and hepatocellular ballooning (a type of injury to liver cells) (on a scale of 0–2), with fibrosis stage (F0–F4) scored separately.

The estimated global prevalence of NAFLD and NASH has risen rapidly in parallel with the dramatic rise in obesity and diabetes. In the United States alone, the prevalence of NASH was estimated to total 19.3 million cases in 2020 and is expected to reach 27 million cases in the United States by 2030, with similar trends occurring globally. Patients with NASH with F2, F3 or F4 fibrosis were believed to encompass approximately 8.3 million patients in the United States in 2020 and that number is expected to grow to 14.1 million by 2030. The population of cirrhotic patients with NASH in the United States is expected to reach 3.5 million in 2030.

NASH: A Serious and Growing Disease, with Negative Outcomes Linked to Severity of Fibrosis



FIBROSIS STAGE	F0/F1	F2	F3	F4
US Prevalence – 2020 *(Estimated)*	11.0M	4.1M	2.6M	1.6M
US Prevalence – *2030* *(Projected)*	12.9M	6.1M	4.5M	3.5M

In addition to living with the burden of illness, NASH with advanced fibrosis can be very expensive for patients, their families and society. Advanced liver fibrosis is generally considered fibrosis stage F3 and F4. The annual economic burden associated with NAFLD and NASH in the United States was estimated to be over $100 billion in 2016. If a patient progresses through the earlier stages of fibrosis to F4 fibrosis, or cirrhosis, there is an increased occurrence of negative liver-related outcomes, including a more than 60% risk of cirrhosis-related complications such as ascites, jaundice, hepatic encephalopathy, variceal bleeds, liver cancer or liver transplant. The median survival for a cirrhotic patient is approximately seven years. We believe that NASH therapies will have the most meaningful impact if they can both reverse fibrosis and prevent patients from worsening to cirrhosis.

Although the mechanism underlying the development and progression from simple steatosis to NASH and cirrhosis is poorly understood, insulin resistance and inflammatory mediators, including lipotoxicity, cytokines and oxidative stress, are believed to promote the development of NASH and its extrahepatic complications. Excess lipotoxic metabolites or fat metabolites in the liver are believed to provide the primary insult in the pathogenesis of NASH, and this metabolic dysregulation can create inflammatory and fibrotic damage. Evidence also supports a role for bile acids in the pathogenesis of liver inflammation and fibrosis. Accumulation of bile acids, and more toxic hydrophobic bile acids in particular, within hepatocytes can cause mitochondrial dysfunction, endoplasmic reticulum stress and immune cell infiltration that can ultimately lead to inflammation, cell death and liver injury.

The presence of diabetes also is associated with more severe liver disease and, in patients with NAFLD and NASH, type 2 diabetes is associated with more severe hepatic and adipose tissue insulin resistance, and more advanced liver steatosis, inflammation and fibrosis by liver histology. In addition, insulin administration may increase steatosis, making the treatment of patients with type 2 diabetes and NASH challenging.

The natural history of NASH is variable from patient to patient and, while the NAS is a valuable tool for diagnosing the disease, it does not appear to be predictive of disease progression. The presence of fibrosis currently is the only factor that is highly predictive for identifying those patients who will progress to cirrhosis. On average, patients with NASH advance one fibrosis stage approximately every seven years. The mortality rate of patients with NASH with fibrosis has been estimated at 1.5% to 3.5% per year, and the leading cause of death (estimated at approximately 53%) of patients with NASH is liver-related. Each stage of worsening of fibrosis correlates to an exponential increase in liver-related mortality rates. Patients with F3 and F4 fibrosis have an approximately 17 times greater risk and 42 times greater risk, respectively, of liver-related mortality than those patients with NASH without fibrosis. Therefore, we expect that treatments that can drive the regression of fibrosis are more likely to have a meaningful impact on clinical outcomes for patients with NASH with F2 to F4 fibrosis.

Our Product Candidates

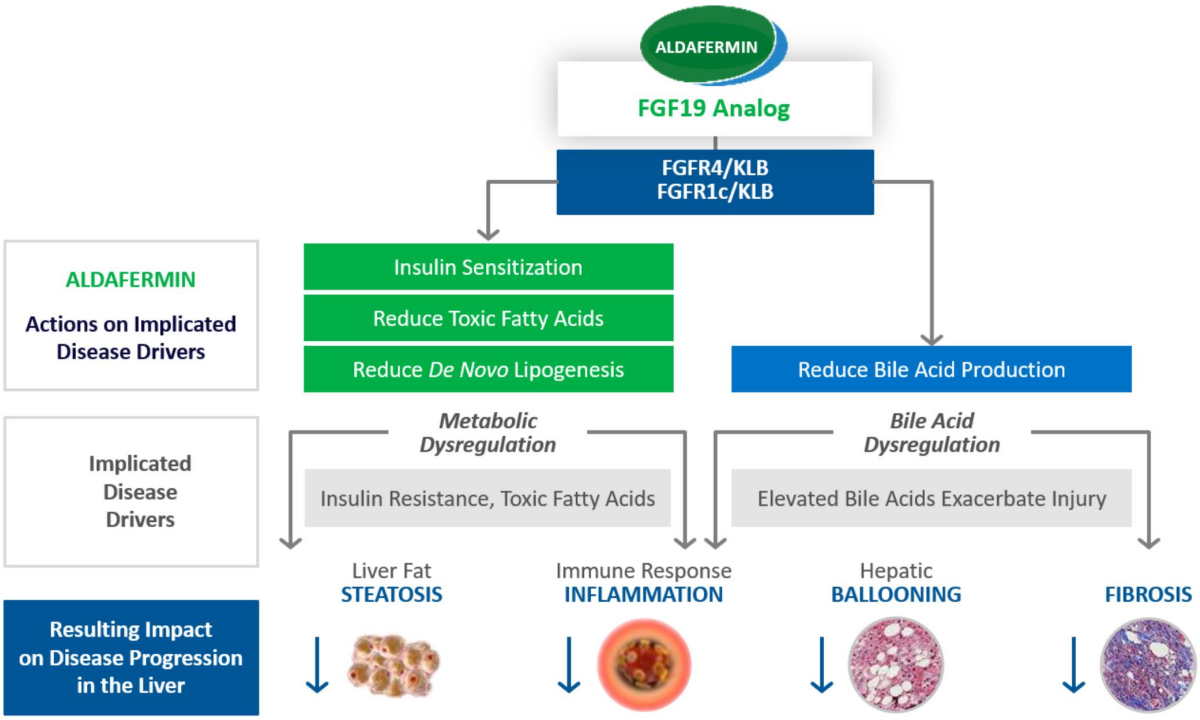
Aldafermin: A Rapid and Potent Approach to Treating NASH

Aldafermin is an engineered analog of human hormone FGF19 that is administered through a once-daily subcutaneous injection and has demonstrated the ability to rapidly improve NASH and reverse liver fibrosis in preclinical and clinical studies. We believe the combination of breadth, magnitude and speed of effect demonstrated by aldafermin in the studies we have conducted will result in a therapeutic agent that, if approved, would provide a needed medicine for physicians to treat patients with NASH with moderate to advanced fibrosis.

We initially identified FGF19 by using our proprietary rodent gastric bypass surgery model designed to discover hormones that may drive the beneficial metabolic effects observed following this type of surgery. We also demonstrated that serum levels of FGF19 are significantly increased in humans after gastric bypass surgery. FGF19 acts as an endocrine hormone to regulate systemic carbohydrate and energy homeostasis, similar to insulin, and also inhibits the production of bile acids in the liver. Systemic FGF19 levels are decreased in patients with NASH, type 2 diabetes or metabolic syndrome, and are normalized after gastric bypass surgery in diabetic human subjects.

The activities ascribed to FGF19 appear to be mediated primarily through two different receptor complexes: fibroblast growth factor receptor 4-beta-klotho, or FGFR4/KLB, and FGFR1c/KLB. FGFR4/KLB receptor complexes are found primarily in the liver and FGFR1c/KLB receptor complexes are found primarily in adipose tissue and the central nervous system. When activated, FGFR4/KLB inhibits the expression of the cholesterol 7alpha-hydroxylase 1, or CYP7A1, gene, which modulates bile acid production through the classical pathway in the liver. There is increasing evidence supporting the role of bile acids as a pathophysiological driver of NASH. Individuals with NASH are reported to have elevated hepatic and circulating concentrations of bile acids. As patients with NASH progress to F2 and F3 fibrosis stages, serum levels of bile acids double as compared to healthy volunteers. A combination of activities from FGFR4/KLB and FGFR1c/KLB are believed to promote multiple beneficial metabolic effects in the liver and systemically, including improved insulin sensitization, a reduction in *de novo* lipogenesis and an increase in fatty acid oxidation.

We designed aldafermin as an analog of human FGF19 to improve the drug-like properties of the protein, remove a tumorigenic signal observed in rodents and retain the beneficial properties of triggering the FGFR4/KLB and FGFR1c/KLB pathways. We believe this tandem receptor-complex activation enables an improvement in the metabolic function of the liver and reduction in bile acid synthesis, which, in turn, enables aldafermin to have a more rapid and direct impact on fibrosis as compared to other agents that only address the metabolic dysfunction of NASH, as illustrated in the figure below.



Our Clinical Experience with Aldafermin in Patients with NASH

Our clinical development program for aldafermin was designed to first assess its safety and tolerability and then test for activity in humans in a variety of disease settings we believed might benefit from the signaling activity of the FGF19 pathway. Each of the trials we have conducted has provided insights into the activity of aldafermin in humans and informed our development plans for NASH. A consistent profile of activity and tolerability has emerged for the compound across these studies.

Aldafermin Phase 2 Clinical Trial in Patients with NASH: Efficacy Results

The Phase 2 aldafermin study in patients with histologically-confirmed NASH included four successive cohorts:

- Cohort 1: a 12-week, multi-center, double-blind, randomized, placebo-controlled study that assessed the efficacy and safety of aldafermin 3 mg and 6 mg once daily through non-invasive measures only;
- Cohort 2: a 12-week, open-label, single-blind expansion study that assessed the efficacy and safety of aldafermin 0.3 mg, 1 mg and 3 mg once daily, with the 3 mg dose group including histology endpoints;
- Cohort 3: a 12-week, open-label, single-blind expansion study that assessed the efficacy and safety of aldafermin 1 mg once daily, including non-invasive and histology endpoints; and
- Cohort 4: a 24-week, multi-center, double-blind, randomized, placebo-controlled study that assessed the efficacy and safety of aldafermin 1 mg once daily, including non-invasive and histology endpoints, with liver biopsies performed at baseline and following 24 weeks of treatment.

Key eligibility criteria were similar across study cohorts and included adult patients with biopsy-confirmed NASH, NAS ≥4 (with at least one point in each NAS component of steatosis, lobular inflammation and

hepatocellular ballooning), presence of liver fibrosis and ≥8% liver fat content, or LFC, as measured by magnetic resonance imaging proton density fat fraction, or MRI-PDFF, an imaging biomarker. Cohorts 1, 2 and 3 enrolled F1-F3 liver fibrosis patients. Cohort 4 enrolled only F2-F3 liver fibrosis patients. Additionally, Cohorts 2-4 studied statin use for those patients that experienced a low-density lipoprotein, or LDL, cholesterol increase during the first two weeks of aldafermin treatment, as further described below. Results from Cohort 1 were presented at the International Liver Congress™ in 2017 and published in *The Lancet* in 2018. Data from Cohorts 2 and 3 were presented at the International Liver Congress in 2018 and The Liver Meeting® in 2018 and published in *Hepatology* in 2019. Data from Cohort 4 was published in *Gastroenterology* and presented at The Digital International Liver Congress and the Liver Meeting in 2020.

In the Phase 2 trial, aldafermin activity was measured across a variety of imaging and serum biomarker measures, or non-invasive measures, as well as histological measures, in order to provide a comprehensive assessment of aldafermin's activity on NASH disease pathology at different time points. For each of Cohorts 1-4, the primary endpoint was the absolute change from baseline to end of treatment in LFC. Responders were defined as patients who achieved a 5% or larger reduction in absolute LFC as measured by MRI-PDFF. Key secondary endpoints included assessments of safety and tolerability, percentage change from baseline (or relative change) in absolute LFC, normalization of LFC to less than 5% and changes from baseline and normalization in alanine aminotransaminase, or ALT, and aspartate aminotransaminase, or AST, biomarkers associated with hepatic inflammation and injury. Exploratory endpoints included the evaluation of biomarkers of NASH pathogenesis and fibrosis, including PRO-C3, the pro-peptide of Type III collagen and an exploratory biomarker of fibrogenesis, as well as assessment of changes in liver histology in a sub-population of patients (the 3 mg aldafermin dose group in Cohort 2 and all patients in Cohorts 3 and 4 who were treated with 1 mg aldafermin).

The table below summarizes the data generated in each of Cohorts 1-4 and shows the consistent effect across each of the non-invasive measures of NASH.

Parameter	DOUBLE BLIND (W12-D1)			OPEN LABEL (W12-D1)			OPEN LABEL (W12-D1)	DOUBLE BLIND (W24-D1)	
	Placebo (N=27)	3 mg (N=27)	6 mg (N=28)	0.3mg (N=23)	1 mg (N=21)	3mg bx (N=19)	1 mg bx (N=24)	Placebo bx (N=25)	1 mg bx (N=52)
MRI-PDFF, Absolute %	−0.1	−9.6	−12.5	−6.5	−11.0	−11.2	−11.0	−2.6	−7.8
Absolute decrease ≥5% (% patients)	7%	74%	79%	56%	86%	100%	92%	24%	68%
MRI-PDFF, Relative %	−1%	−47%	−61%	−34%	−57%	−67%	−58%	−13%	−39%
Relative decrease ≥30% (% patients)	7%	85%	86%	48%	81%	100%	92%	29%	66%
ALT, Absolute (U/L)	2	−35	−32	−24	−41	−53	−64	−7	−41
ALT, Relative %	1%	−43%	−44%	−33%	−54%	−60%	−67%	−6%	−49%
Pro-C3, Absolute (ng/ml)	−1.2	−5.4	−3.6	−2.4	−4.7	−11.1	−4.5	−1.2	−5.4
Fibrosis improvement, without worsening of NASH (% of patients)	N/A	N/A	N/A	N/A	N/A	42%	25%	18%	38%
Resolution of NASH, without worsening of fibrosis (% of patients)	N/A	N/A	N/A	N/A	N/A	10%	12%	9%	24%
Fibrosis improvement AND resolution of NASH (% of patients	N/A	N/A	N/A	N/A	N/A	10%	8%	0%	22%

bx=biopsy

In August 2020, we announced final data from Cohort 4, including a new analysis of Cohort 4 data from patients with NASH with F3 liver fibrosis. Cohort 4 was statistically powered to demonstrate the effect of 1 mg aldafermin treatment versus placebo on the primary endpoint of change in LFC, which achieved statistical significance. In addition, the study assessed secondary and exploratory endpoints of liver histology and biomarkers of disease activity. The histology results revealed that treatment with aldafermin led to clinically meaningful improvements at 24 weeks versus placebo in fibrosis improvement of ≥1 stage with no worsening of NASH (38% of aldafermin-treated patients vs. 18% placebo) and in resolution of NASH with no worsening of liver

fibrosis (24% of aldafermin-treated patients vs. 9% placebo). The study also demonstrated a statistically significant impact on the combined endpoint of both fibrosis improvement and resolution of NASH (22% in aldafermin-treated patients vs. 0% placebo).

Summary of Cohort 4 Histology Data[1]

Proportion of Patients Achieving Endpoints	Aldafermin 1 mg (n=50)	Placebo (n=22)
Fibrosis improvement (≥1 stage) with no worsening of NASH[2]	38%	18%
Resolution of NASH with no worsening of liver fibrosis[3]	24%	9%
Fibrosis Improvement and resolution of NASH[4]	22%*	0%
NAS reduction of ≥2 points with no worsening of liver fibrosis	62%***	9%

*p=0.015; ***p<0.001

1 Per protocol, analyzed using the "liver histologic population," defined as the subset of enrolled patients who had valid, non-missing biopsy data at both baseline and week 24 (n=72).

2 Defined as patients having an improvement in liver fibrosis ≥1 stage and having no worsening of hepatocellular ballooning, no worsening of lobular inflammation and no worsening of steatosis from baseline to week 24.

3 Defined as patients having a non-alcoholic fatty liver disease activity score, or NAS, of 0 or 1 for lobular inflammation and 0 for hepatocellular ballooning, with no worsening of fibrosis (no progression of NASH fibrosis stage) from baseline to week 24 (as defined by Clinical Research Network criteria).

4 Defined as patients having an improvement in liver fibrosis ≥1 stage and having a NAS of 0 or 1 for lobular inflammation and 0 for hepatocellular ballooning at week 24.

Efficacy data from a secondary analysis of patients with advanced liver fibrosis enrolled in Cohort 4 demonstrated that 30% of patients with F3 liver fibrosis treated with 1 mg aldafermin achieved fibrosis improvement ≥1 stage without worsening of NASH, compared to 0% in the placebo arm. A responder analysis conducted in patients with F3 liver fibrosis who achieved ≥30% LFC reductions showed that 46% of patients treated with 1 mg aldafermin had fibrosis improvement of ≥1 stage without worsening of NASH, compared to 0% of placebo patients.

Aldafermin Increases Serum Levels of LDL Cholesterol in Patients with NASH

A byproduct of aldafermin's potent inhibition of the primary pathway for bile acid synthesis, also known as the classical pathway, is the elevation of LDL cholesterol in the serum of patients with NASH. Cholesterol serves as the precursor molecule in a multi-step enzymatic pathway that generates various forms of bile acids. CYP7A1 is the rate-limiting enzyme in this pathway and, therefore, serves as a regulatory control point for the classical pathway for bile acid synthesis. We believe a primary role of FGF19 and aldafermin is to inhibit bile acid synthesis through the classical pathway by activating a signaling cascade that inhibits CYP7A1 activity. We believe that as a direct effect of this on-target activity, cellular cholesterol is no longer metabolized to bile acids and instead is shunted into the blood stream, causing an elevation of serum LDL cholesterol.

We believe that elevated serum LDL cholesterol is a confirmatory indication of aldafermin activity in patients with NASH, which correlates with its beneficial effects on liver health. The impacts of these drug-induced changes in cholesterol are unknown. However, sustained and prolonged LDL cholesterol elevations in untreated patients are associated with cardiovascular disease through atherosclerotic plaque development. In Cohorts 2, 3 and 4 of our Phase 2 clinical trial of aldafermin, we demonstrated the ability of concomitant statin use to mitigate the serum LDL cholesterol elevations driven by aldafermin activity. Patients in these cohorts were directed to take 20 mg of rosuvastatin daily for the remainder of the trial once an elevation of LDL cholesterol of at least 10 mg/dl was recorded. The rosuvastatin dose was increased to 40 mg if required to adequately control LDL cholesterol while on treatment.

Analysis of lipid data presented at The Digital International Liver Congress in August 2020 found that the statin use algorithm applied to optimize the lipid management of both aldafermin and placebo patients in Cohort 4 was associated with an overall reduction in the 10-year atherosclerotic cardiovascular disease, or ASCVD, risk score for patients participating in Cohort 4. The analysis found that the 10-year ASCVD risk score declined from a baseline of 15% to 12% in patients treated with aldafermin at week 24 (compared to a decline from baseline of 12% to 11% in the placebo arm). Over the course of the study, the concomitant use of aldafermin and

rosuvastatin in Cohort 4 led to a mean LDL cholesterol decline of 19 mg/dL in the treatment group versus a mean decline of 16 mg/dL in the placebo group. Over the course of the study, in Cohort 4, triglycerides declined 62 mg/dL in the aldafermin treatment arm vs. 29 mg/dL in placebo. Data from Cohort 4 also showed no effect on blood pressure or heart rate in patients in the treatment arm.

Our Ongoing Aldafermin Clinical Trials

Overview

To date, aldafermin has been dosed in over 500 patients and healthy volunteers across multiple liver and metabolic diseases, including more than 200 patients with NASH. In addition to the completed Phase 2 clinical trial described above, aldafermin is currently being tested in the ongoing Phase 2b ALPINE 2/3 trial in patients with NASH with F2 and F3 liver fibrosis, which completed enrollment in September 2020, and in the ongoing ALPINE 4 trial in patients with NASH with F4 liver fibrosis and well-compensated cirrhosis, which commenced enrollment in February 2020.

Aldafermin Phase 2b ALPINE 2/3 Clinical Trial

The ALPINE 2/3 clinical trial is a multi-center, double-blind, placebo-controlled study administering 0.3 mg, 1 mg or 3 mg of aldafermin or placebo, once-daily, subcutaneously for 24 weeks to patients with NASH with F2 and F3 liver fibrosis. We enrolled and dosed approximately 170 patients across 30 sites in the United States. Patients receive liver biopsies to qualify for the trial and at the end of the 24-week treatment. The primary objective of the ALPINE 2/3 trial is to evaluate a dose response showing an improvement in liver fibrosis by ≥ 1 stage with no worsening of steatohepatitis at week 24. The enrollment criteria, study design and study conduct are consistent with the U.S. Food and Drug Administration, or FDA, draft industry guidance regarding the development of drugs for NASH that was published in December 2018. We expect to report topline results from our ALPINE 2/3 clinical trial in the second quarter of 2021.

Aldafermin Phase 2b ALPINE 4 Clinical Trial

The ALPINE 4 clinical trial is designed to evaluate the treatment effect of aldafermin in a population of patients with NASH with F4 liver fibrosis and well-compensated cirrhosis. The objective of this trial is to evaluate whether the fibrosis regression we have observed in patients with F2 and F3 fibrosis can also be achieved in compensated cirrhotic patients with NASH, for whom liver mortality rates are high and liver transplant is the only option. We initiated the ALPINE 4 clinical trial in February 2020 and expect to enroll approximately 160 patients across 70 sites in the United States, Europe, Hong Kong and Australia.

Our Future Aldafermin Clinical and Commercial Product Development Plans

There are currently no FDA-approved therapeutics for NASH. The FDA has provided draft guidance to the industry regarding acceptable development pathways for investigational NASH agents as follows:

- the agent must be tested in patients with NASH, typically characterized as having a NAS of four or greater and at least one point in each component, with F2 or F3 fibrosis;
- for an accelerated approval path (Subpart H (drugs)/Subpart E (biologics)), a surrogate endpoint that is “reasonably likely to predict clinical benefit” is acceptable. A subsequent post-marketing confirmatory outcomes study is then required to be conducted to maintain licensure; and
- for a Subpart H/E approval, three biopsy-based surrogate endpoints are endorsed by the FDA, defined as the proportion of patients that achieve:
    - resolution of NASH, defined as a lobular inflammation score = 0 or 1 and a hepatocellular ballooning score = 0, with no worsening of fibrosis; or
    - improvement of fibrosis, defined as one stage improvement in fibrosis with no worsening of NASH; or
    - resolution of NASH and improvement in fibrosis (as defined above).

We believe many agents in development for NASH will opt for a Subpart H/E accelerated approval pathway and rely on surrogate endpoints for initial approval. Fibrosis stage is currently the only measurement that is correlated to liver outcomes and, therefore, the potential for many agents that will rely only on the resolution of a NASH surrogate endpoint to demonstrate clinical benefit will remain uncertain until a confirmatory outcomes study is successfully completed. In addition, while the FDA has provided guidance for accelerated approval of NASH therapies, no product has yet been successful in achieving regulatory approval in the United States. If we seek accelerated approval for aldafermin for NASH based on a surrogate endpoint, the FDA may not accept such endpoint, may require additional studies or analysis or may not approve aldafermin on an accelerated basis, or at all.

We are leveraging the results of Cohort 4 of our Phase 2 clinical trial, as well as guidance from the FDA, to inform early Phase 3 planning and design. We expect that the ALPINE 2/3 clinical trial results, anticipated in the second quarter of 2021, coupled with results from a hepatic impairment study, will provide further information to support our design of a pivotal clinical trial program to enable a biologics license application, or BLA, submission. We believe the clinical data produced with aldafermin in patients with NASH to date supports a product profile that may be unique in the current landscape of NASH therapeutics in development. Our data suggests aldafermin is capable of improving fibrosis in patients after as few as 12 weeks of treatment, while also exerting a positive impact on the other parameters of NASH, including steatosis, lobular inflammation and hepatocellular ballooning. If our initial signals of activity continue in later-stage clinical development, we believe that aldafermin, designed as a once-daily injectable medication, will be well suited to treat patients with NASH with F2, F3 and, potentially, early F4 fibrosis. As a result of these findings, we believe aldafermin could be particularly well suited for more fibrotic, later-stage patients with NASH. This advanced disease population is typically under the care of hepatologists, as contrasted with the typically asymptomatic early-stage NASH population, the majority of whom have not yet been diagnosed.

We have obtained Fast Track designation for aldafermin for the treatment of NASH in adults.

Our goal is to position aldafermin to physicians, if aldafermin is approved, as a potent, rapidly-acting medication that can repair NASH-damaged livers to avoid progression to end-stage liver disease and liver transplantation.

In clinical trials to date, aldafermin has been delivered as a once-daily injectable using a pre-filled, single-use, glass syringe. We are developing a formulation of aldafermin intended to be suitable for testing in a more commercially attractive multi-use pen injector, similar to the devices currently delivering injectable type 2 diabetes treatments. Longer term, we are pursuing development of a longer half-life version of aldafermin that may enable less frequent dosing. At present, we have programs investigating delayed-release technologies and protein modification to support this strategy. These efforts are currently at the research stage.

Aldafermin Safety and Tolerability Profile in NASH

Aldafermin has been generally well tolerated. In patients with NASH receiving various doses of aldafermin (between 1 mg and 6 mg) in Cohorts 1-4 of our completed Phase 2 trial, the most common reported adverse events occurring in more than 10 percent of patients across all four cohorts included diarrhea, headache, abdominal distension, nausea, fatigue, vomiting, constipation, frequent bowel movements, injection site bruising, urinary tract infection, nasopharyngitis, and abdominal pain, injection site reaction, vitamin D deficiency, injection site symptoms (such as pruritus, erythema, or swelling), cough, fecal color discoloration, cholesterol and LDL cholesterol increase, with the majority of adverse events classified as mild to moderate. In Cohort 4 specifically, aldafermin 1mg had an overall adverse event profile that was similar to that of placebo, with no meaningful difference in gastrointestinal, or GI, or pruritus adverse events in aldafermin compared to placebo. The most common adverse events (occurring in more than 10 percent of patients in either treatment arm) were diarrhea, headache, abdominal distension, nausea, fatigue, diabetes mellitus and peripheral edema, were primarily mild to moderate and occurred with comparable frequency in both the aldafermin and placebo arms.

A single serious adverse event, or SAE, acute pancreatitis, was reported in Cohort 1 and assessed as possibly related to study drug. In Cohorts 2 and 3, six patients receiving aldafermin reported a total of eight SAEs, pleurisy, vertigo, headache, hypertension, cardiac arrest, chest pain, pneumonia and kidney mass, none of which were considered related to study drug. In Cohort 4 specifically, the rate of SAEs experienced were similar as between aldafermin (n=2) and placebo (n=3). The two SAEs in the aldafermin treatment arm, rectal bleeding and liver biopsy complication, were both considered unrelated to study drug.

Aldafermin Patent Portfolio

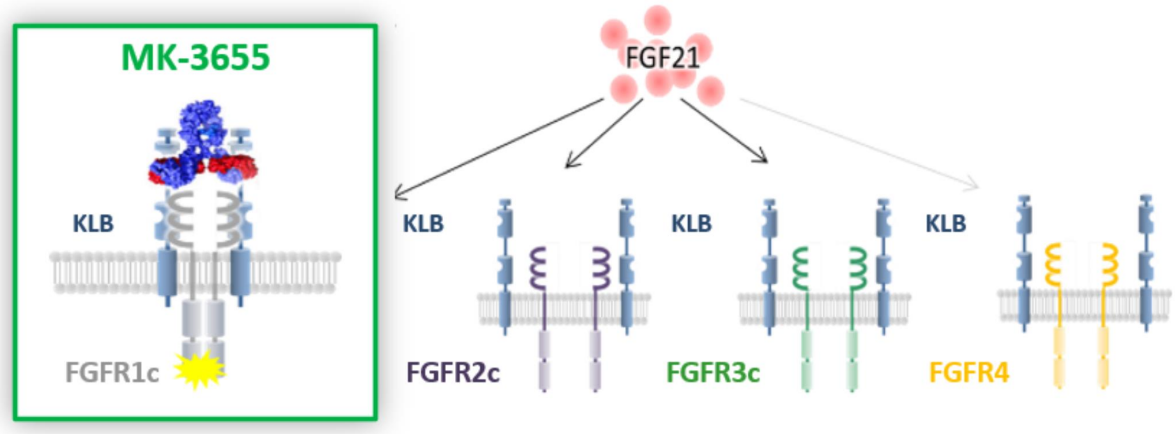
As of December 31, 2020, we owned 23 issued patents in the United States, as well as issued patents in more than 40 foreign countries, including various member states of the European Patent Office, or EPO, covering aldafermin, related compositions-of-matter and methods of use. We also own patent applications covering similar subject matter in the United States, various member states of the EPO and multiple other foreign countries. The earliest issued patents in the United States are expected to expire in 2032, not including any patent term adjustments and any patent term extensions.

MK-3655 (formerly NGM313): An Insulin Sensitizer for the Treatment of NASH

MK-3655, previously known as NGM313, is a long-acting agonistic antibody discovered by us that selectively activates FGFR1c/KLB. In November 2018, Merck exercised its option for a license to conduct further research, develop and commercialize MK-3655 and other FGFR1c/KLB agonists pursuant to our Collaboration Agreement. As a result, under the current terms of the Collaboration Agreement, Merck is responsible for further MK-3655 development activities. In Phase 1 clinical testing conducted by us, MK-3655 demonstrated favorable tolerability and data has shown the agent is capable of reducing LFC and improving metabolic biomarkers in obese, insulin resistant subjects with NAFLD after a single dose. We believe that MK-3655 has the potential to be a treatment for those patients with NASH with early to moderate fibrosis with or without type 2 diabetes. In the fourth quarter of 2020, Merck initiated the Phase 2b clinical trial of MK-3655 administered every four weeks by subcutaneous injection to patients with F2 or F3 liver fibrosis and the trial is currently enrolling patients.

FGF21 is a protein hormone secreted by the liver, adipocytes, pancreas and skeletal muscle that regulates metabolic homeostasis. It exerts its effects on metabolic processes by signaling through the receptors known as FGFR1c, FGFR2c and FGFR3c; KLB functions as a co-receptor to enhance the binding of these receptors and is essential for mediating FGF21 activity. Multiple pharmaceutical companies have conducted human testing of therapeutics that are modified versions of FGF21. Early clinical trials of modified FGF21 ligands in humans demonstrated variable improvement in insulin sensitivity, reduction in LFC and improvement in lipid profile, body weight loss, NASH resolution and fibrosis improvement, suggesting potential utility in treating NASH. However, native FGF21 has been shown to have effects that may limit its potential for drug development as a result of potential effects on tremor, cortisol, bone and blood pressure and the potential to cause GI issues. We designed MK-3655 to harness the beneficial metabolic properties of FGF21 without some of its limitations.

MK-3655: An Agonistic Antibody of the FGFR1c/KLB Receptor Complex



We believe that developing a specific, agonistic antibody that selectively activates the FGFR1c/KLB pathway may obviate the risks associated with therapeutics based on the native FGF21 ligand. MK-3655, through its highly specific binding to KLB, results in the exclusive activation of FGFR1c-mediated signaling without triggering signaling through the other FGF receptors, such as FGFR2c or FGFR3c. Moreover, as MK-3655 recognizes an epitope on KLB that is distinct from the FGF19 or FGF21 binding sites, it does not compete with these natural ligands for binding with the FGFR1c/KLB complex. We believe that this non-overlapping binding site reduces the potential for side effects resulting from MK-3655 inhibition of endogenous FGF19 and FGF21 hormone activity.

Our Clinical Experience with MK-3655

MK-3655 Phase 1 Single Ascending Dose, or SAD, and Multiple Ascending Dose, or MAD, Clinical Trial

Our first-in-human Phase 1 clinical trial of MK-3655 was a blinded, placebo-controlled study in overweight or obese but otherwise healthy adults in which single and multiple once-monthly subcutaneous injections of MK-3655 or placebo were tested to evaluate the safety, tolerability and pharmacokinetics, or PK, of MK-3655. MK-3655 was well tolerated, with signs of biological activity indicative of insulin sensitization after a single dose.

In the MAD portion of the study, three once-monthly doses ranging from 10 mg to 240 mg of MK-3655 were administered and, after 12 weeks, mean decreases from baseline in hemoglobin A1c, or HbA1c (the amount of glucose attached to hemoglobin), fasting glucose, fasting insulin and HOMA-IR (a measure of insulin resistance) were observed at the higher doses relative to placebo. Similar to the SAD portion of the study, a favorable lipid profile was demonstrated at the end of treatment on day 85, as shown in the table below. In patients from the SAD and MAD cohorts that received the highest dose level of MK-3655, an increase in placebo-subtracted body weight at end of treatment of 1.6 kg and 2.4 kg, respectively, was noted. This trend in body weight increase is consistent with the degree of insulin sensitization effects observed at these doses, and there was no evidence of edema, fluid retention or hemodilution associated with MK-3655 treatment. Despite the change in weight, there was no statistically significant increase in waist circumference in these cohorts of subjects receiving MK-3655. The beneficial changes in glucose metabolism, lipid levels and biomarkers of insulin sensitization supported further evaluation of MK-3655 in patients with fatty liver and insulin resistance.

MK-3655 Shown to Impact Key Glucoregulatory and Lipid Parameters

	Phase 1 SAD (Change from Baseline at Day 29)		**Phase 1 MAD** (Change from Baseline at Day 85)	
Parameter	**Placebo** (n=19)	**NGM313 240 mg** (n=9)	**Placebo** (n=13)	**NGM313 240 mg** (n=14)
HbA1c (%)	**-0.04**	**-0.18**	**0.03**	**-0.11**
Fasting Glucose (mg/dl)	**2.2**	**-3.8**	**-2.3**	**-4.7**
Fasting Insulin (mU/l)	**1.6**	**-4.0**	**-0.9**	**-3.9**
HOMA-IR	**0.5**	**-1.0**	**-0.1**	**-1.0**
Triglycerides (mg/dl)	**16**	**-46**	**10**	**-50**
HDL (mg/dl)	**-2**	**10**	**0**	**8**
LDL (mg/dl)	**-12**	**-25**	**-5**	**-15**

In both the SAD and MAD cohorts, MK-3655 was well tolerated. There were two SAEs reported in the MK-3655 treatment group, lower GI hemorrhage due to hemorrhoids and cholecystitis, both of which were deemed by the investigators to be unrelated to treatment with MK-3655. The majority of adverse events were mild to moderate in severity, and treatment-related events with the greatest proportion of subjects were GI disorders,

injection site reactions, upper respiratory tract infections, headache and increased appetite. There were no changes in bone mineral density and bone formation and resorption markers observed in the MAD trial among subjects treated with MK-3655, in contrast to pioglitazone, an insulin sensitizer for the treatment of type 2 diabetes which has demonstrated beneficial activity in patients with NASH, where an increased risk of bone fractures in women has been described. No symptomatic hypoglycemia was observed with MK-3655 treatment. The PK profile suggests that MK-3655 displays nonlinear kinetics following a single dose, which is anticipated for an antibody that displays target-mediated clearance.

MK-3655 Phase 1b Early Proof-of-Concept Clinical Trial

We conducted a Phase 1b randomized, open-label, parallel group clinical trial to evaluate the safety, tolerability, PK and pharmacodynamics, or PD, of a single MK-3655 dose or of daily oral pioglitazone in 25 obese insulin resistant subjects with NAFLD. The Phase 1b clinical trial evaluated the ability of MK-3655 to decrease LFC to support the clinical development of MK-3655 in patients with NASH, as well as its effect on glucose disposal to assess the potential of MK-3655 in the treatment of patients with type 2 diabetes. A single subcutaneous dose of 240 mg MK-3655 was selected based on the clinical PK and PD data and the tolerability profile from the Phase 1 SAD/MAD trial described above. The highest approved daily oral dose of 45 mg pioglitazone was used in this study to provide the opportunity for maximal efficacy as a comparator in a trial with a short treatment duration of five weeks.

The primary objectives of the trial were to evaluate changes from baseline in LFC as measured by MRI-PDFF at day 36 and changes from baseline in whole body insulin sensitivity at day 29 in subjects treated with MK-3655 as compared to pioglitazone. A single dose of MK-3655 resulted in a statistically significant least squares mean change from baseline to day 36 of -6.3% and -37% in absolute and relative LFC, respectively ($p<0.0001$), while daily dosing of 45 mg pioglitazone resulted in a statistically significant least squares mean change from baseline to day 36 of -4.0% and -25%, respectively ($p<0.001$). The change from baseline with MK-3655 treatment was not significantly different relative to that observed with pioglitazone ($p=0.08$), however, the study was not powered to demonstrate statistical significance between groups. In addition, results indicated that a single dose of MK-3655 resulted in a statistically significant mean decrease from baseline of 0.24% in HbA1c at day 36 ($p<0.0001$), as compared to a decrease of 0.11% with a daily dose of 45 mg of pioglitazone, without hypoglycemia. A reduction in HbA1c of the magnitude observed in this study's insulin resistant, non-diabetic patient population in this time frame supports the potential of MK-3655 to improve glucose control in type 2 diabetes patients. This was accompanied by statistically significant reductions from baseline in HOMA-IR, serum concentrations of fasting glucose, ALT, AST, triglycerides and LDL cholesterol, and a statistically significant increase in HDL cholesterol levels at day 28 (all $p<0.05$). PRO-C3 was also significantly reduced with MK-3655 treatment but not with pioglitazone ($p<0.01$).

MK-3655-treated patients had a least squares mean increase from baseline in body weight of 1.6 kg at day 36, as compared to 2.4 kg with pioglitazone. This study indicated that MK-3655 was well tolerated, with no SAEs and no adverse event leading to study discontinuation. All adverse events observed during the course of the study were deemed mild, with increased appetite (12%) and injection site reaction (12%) being the only adverse events reported in at least 10% of MK-3655-treated subjects.

Data from the Phase 1 SAD/MAD clinical trial and the Phase 1b clinical trial support the potential for MK-3655 to be the first insulin sensitizer approved for the treatment of NASH, without the safety concerns that impact currently available agents targeting insulin resistance, such as edema, fluid retention, heart failure and bone fractures. Given that the metabolic changes of MK-3655 were seen after only a single dose, it is possible that a more substantial improvement might be observed after longer duration of treatment.

Ongoing MK-3655 Phase 2b Clinical Trial in NASH

Because Merck exercised its option to MK-3655 under the Collaboration Agreement, Merck is responsible for all future MK-3655 development under the current terms of the Collaboration Agreement. At the end of 2020, Merck initiated a Phase 2b study of MK-3655 for the treatment of patients with NASH with F2 or F3 fibrosis and is enrolling patients in the trial. The Phase 2b trial is a multi-center, double-blind, placebo-controlled study administering 50 mg, 100 mg and 300 mg doses of MK-3655 administered every four weeks compared to placebo for 52 weeks. Merck designed the trial to enroll approximately 320 patients across 137 sites globally. Patients receive liver biopsies to qualify for the trial and at the end of the 52-week treatment. The primary objective of the Phase 2b study is NASH resolution without worsening of fibrosis at 52 weeks.

MK-3655 Patent Portfolio

As of December 31, 2020, we owned three issued patents in the United States, as well as pending patent applications in the United States and granted patents and pending patent applications in multiple jurisdictions outside of the United States covering MK-3655, related compositions-of-matter and methods of use. The earliest issued patents in the United States are expected to expire in 2035, not including any patent term adjustments and any patent term extensions.

NASH Competition

Current Treatments

Currently, there are no therapeutic agents approved by the FDA or the European Medicines Agency, or EMA, for the treatment of NASH. Weight loss through diet and lifestyle management is currently considered the first-line treatment strategy for NASH and is associated with improvement in liver histology and a reduction in cardiovascular and metabolic complications. However, fewer than 10% of patients are successful in achieving or maintaining at least a 10% total body weight loss that is sufficient to improve fibrosis and, therefore, require other interventions. In cases of morbid obesity, gastric bypass surgery has been successful in resolving NASH in a majority of patients; however, the effect on fibrosis improvement was less substantial and the risk of complications and expense of the surgery limit more widespread use.

In the absence of approved products, some physicians utilize agents approved for other indications, including Vitamin E and pioglitazone; however, the evidence of their effect on NASH is modest and/or they have safety issues that limit acceptance. Given the increasing disease burden and lack of approved treatment options, the development of novel pharmacologic therapies to treat NASH is critical.

Treatments in Development

While there are many agents in clinical development for NASH, the landscape can be subdivided into a few mechanistic classes based on the putative disease drivers they target. Most treatment approaches for NASH have focused on the prevention or reversal of liver injury either by predominantly treating the metabolic dysregulation of the disease or through directly targeting inflammatory or fibrogenic pathways. NASH is a chronic, slowly progressing disease and many believe that slowing the progression or reversing disease requires treatment periods of at least 12 months.

Product Candidates Pursuing a Metabolic Approach to Treating NASH

Certain NASH drug development candidates are focused on the metabolic components of the disease, such as insulin resistance and lipotoxicity, that are associated with the inception and early stages of the disease pathology. The rationale for these product candidates is an expectation that the improvement of the underlying liver insult of metabolic dysregulation will allow the liver to recover over the long term, which would potentially allow the liver to repair itself and eventually improve fibrosis. Metabolically-oriented mechanism of action classes that have product candidates with histological proof-of-concept data include Madrigal Therapeutic, Inc.'s resmetirom and Viking Therapeutic's VK2809, both thyroid hormone receptor β-selective (THRβ) agonists; Novo Nordisk AS's glucagon-like peptide (GLP)-1 agonist, semaglutide; the stearyl-CoA desaturase inhibitor aramchol from Galmed; Inventiva SA's pan-peroxisome proliferator-activated receptors (PPAR) agonist, lanifibranor; and Akero Therapeutics, Inc.'s efruxifermin, and 89 Bio's BIO89-100, both analogs of fibroblast growth factor 21 (FGF21); and Genentech/Roche's BFKB8488A, an FGFR1c/KLB bi-specific agonistic antibody.

Although clinical data for some compounds in this mechanistic class show a beneficial effect on steatosis and an improvement in the NAS, the effect on fibrosis is likely to be highly dependent on the compound being tested. Any of these metabolic-focused compounds that are ultimately approved may be appropriate to halt the progression of disease in earlier-stage patients with NASH or to be used in combination with other agents. Considering the correlation of liver failure outcomes with fibrosis stage, we believe the patients with NASH with moderate to advanced fibrosis (F2 to F4) will require a more potent and fast-acting agent to prevent the progression to end-stage liver disease.

Product Candidates Pursuing an Anti-Inflammatory and/or Anti-Fibrotic Approach to Treating NASH

Product candidates targeting various mechanisms with possible anti-inflammatory and anti-fibrotic effects are also in clinical testing for NASH. These classes of compounds have shown mixed results in meaningfully

improving the fibrosis score of patients. Where fibrosis improvements have been shown, results have either been transient or not accompanied by significant improvements in other histological measures of the disease, which may reflect the difficulty in treating the disease without removing the underlying insult of lipotoxicity or the challenge of impinging on the complex process of hepatocellular death and fibrosis from collagen deposition by intervention through a single pathway. Members of the "anti-inflammatory" or "anti-fibrotic" mechanism of action classes with compounds that have histological proof-of-concept data include farnesoid X receptor (FXR) agonists, such as Intercept Pharmaceuticals, Inc.'s, or Intercept's, obeticholic acid and Enanta Pharmaceuticals, Inc.'s EDP-305; and a chemokine (C-C motif) receptors 2 (CCR2) and 5 (CCR5) dual antagonist. A New Drug Application, or NDA, for obeticholic acid was filed with the FDA by Intercept in September 2019 and received a complete response letter in June 2020. Intercept has reported that it intends to resubmit its NDA for obeticholic acid by the end of 2021.

An ongoing consideration in NASH clinical development is pursuing combination treatments in an attempt to combine agents with less than optimal activity on their own to achieve a more clinically meaningfully result. Combinations currently being evaluated in proof-of-concept trials include: metabolic/anti-fibrotic combinations such as semaglutide/cilofexor/firsocostat and tropifexor/licogliflozin (FXR agonist/SGLT-2, both from Novartis AG) and anti-inflammatory/anti-fibrotic duos such as cenicriviroc/tropifexor.

Therapeutic Area: Retinal Diseases

Complement C3 is a protein implicated in the pathology of GA. NGM621 is a humanized Immunoglobulin 1, or IgG1, monoclonal antibody engineered to potently bind to, and be a long-acting inhibitor of, complement C3 activity. In preclinical models, NGM621's high-affinity binding to C3 has demonstrated the potential for potent C3 inhibition. NGM621 is currently being tested in the ongoing Phase 2 CATALINA clinical trial in patients with GA to evaluate its effects on disease progression when given every four weeks or every eight weeks via intravitreal, or IVT, injections. The first patient was dosed in the CATALINA trial, which we designed to be a proof-of-concept trial, in July 2020. Under the current terms of the Collaboration Agreement, Merck has a one-time option to license NGM621 upon completion of a proof-of-concept study in humans.

Geographic Atrophy Disease Overview

GA is the advanced form of one of two types of advanced age-related macular degeneration, or AMD, and is a major cause of blindness for elderly patients in mainly developed countries. GA has no FDA- or EMA-approved treatments and we are not aware of any approved treatments for GA in other countries. GA afflicts over one million patients in the United States, similar to its neovascular counterpart, commonly referred to as wet AMD, and approximately five million patients worldwide. GA is a progressive retinal degenerative disease and can exact an emotional, economic and societal toll on both patients and their caregivers. One in six people with GA becomes legally blind within six years of diagnosis. The decline in visual function experienced by patients with GA is typically bilateral and directly related to the progressive loss of retinal photoreceptors, retinal pigment epithelium, or RPE, and choriocapillaris in the macular, or central, region of the retina. As the pattern and location of the atrophic lesions within the macula varies by patient, the visual deficits they experience vary in severity and impact until the foveal region, a depression in the inner retinal surface that is specialized for maximum visual acuity, is completely affected. The visual symptoms of GA are associated with disease burden and functional consequences for the patient, which can include the inability to drive, read and perform activities of daily living, a reduction in quality of life and increased likelihood of accidents or injuries. Dysregulated activation of the complement system, a key component of the immune system, including complement C3, has been implicated in the onset and progression of GA.

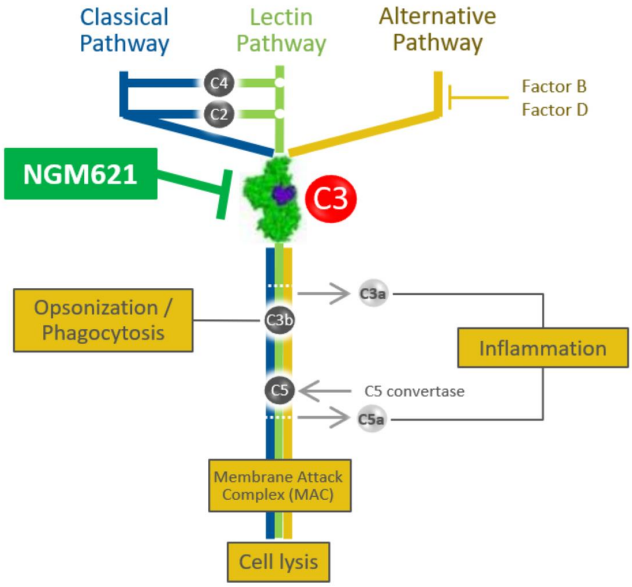
NGM621: A Potential Treatment for Geographic Atrophy

NGM621 is a proprietary humanized inhibitory monoclonal antibody that binds with high affinity to complement C3 and potently blocks downstream complement activation. Human genetics and histopathological data strongly suggest that overactivation of the complement system is linked to the development and progression of AMD overall and GA specifically and causes chronic inflammation, cell injury and death of retinal photoreceptors, RPE and choriocapillaris, leading to irreversible vision loss. The genetic evidence suggests that variants in the complement pathway account for the majority of the known genetic risk for GA and AMD. In humans, histopathological analysis of eyes afflicted with GA show a deposition of complement proteins, including C3, on photoreceptors preceding their degeneration. Accordingly, there is both genetic and physiological

evidence implicating the role of complement in the pathology of the disease and suggesting that inhibition of complement activation may effectively slow the progression of photoreceptor loss.

A central component of the mammalian immune system, complement can be activated by three main pathways, the classical, lectin and alternative pathways, that converge on complement C3, a master regulator of the complement cascade. NGM621 inhibits complement activation at the level of C3, which affords the opportunity to block an array of potentially detrimental downstream effects. Complement C3 is the most upstream point of convergence for all three complement activation pathways and encouraging preclinical and clinical data support inhibition of complement C3 as a promising therapeutic strategy in GA.

The Complement Cascade



NGM621 binds with high affinity to intact human C3 (K_D=0.34 nM) but shows significantly lower affinity (>100-fold) to C3 cleavage fragments C3a, C3b, C3c and C3d. This novel binding profile, characterized by high affinity and specificity for intact C3, translates into potent NGM621-mediated inhibition of complement activation via both the alternative (IC_{50} =37 nM) and classical (IC_{50}=74 nM) pathways in *in vitro* hemolytic assays. Furthermore, NGM621 has demonstrated *in vivo* activity in an ocular complement activation model in cynomolgus monkeys.

The evaluation of NGM621 in patients with GA also provides an opportunity to test the effects of complement inhibition on disease progression using a molecule that lacks polyethylene glycol, or PEG, modification to aid ocular residency. Certain other complement inhibitors in development for GA that are PEGylated have demonstrated numerical dose-dependent increases in new onset wet AMD. The cases of wet AMD are characterized by choroidal neovascularization, or CNV, in the eyes being studied, which means abnormal blood vessels are growing in the retina, causing vascular leakage and in most cases requiring anti-VEGF treatment. The findings in recent clinical trials of other complement inhibitors in development potentially implicate contributions from complement inhibition and/or PEG modification to the undesirable development of CNV. However, clinical evidence from several other GA trials with complement inhibitors, together with studies in nonclinical AMD models, suggest that complement inhibition may not promote development of CNV. In fact, C3 inhibition in a nonclinical model approximating wet AMD in mice results in a significant reduction of vascular leakage; whereas, in the same model, IVT injection of PEG leads directly to an exacerbation of vascular leakage and angiogenesis. This suggests that NGM621, which lacks PEG modification, may not exacerbate CNV, which could be a safety advantage. As a result, given the significant unmet medical need for treatment for GA, NGM621

has the potential to provide a desirable treatment option with a favorable efficacy and safety profile, acting to slow the rate of disease progression while retaining the advantages of less frequent dosing.

Our Clinical Experience with NGM621

Our clinical development program for NGM621, which is focused on ocular and not systemic administration, was structured to first assess safety and tolerability in a Phase 1 single dose and multi-dose escalation trial and then continue to evaluate safety as well as test for efficacy in a robust Phase 2 trial for patients with GA.

NGM621 Phase 1 Safety and Tolerability Trial

We initially conducted a first-in-human, open-label Phase 1 clinical trial of NGM621, administered via IVT injections, in patients with GA. We announced the results of this trial in November 2020 at the American Academy of Ophthalmology 2020 Virtual, or AAO. The primary objective of the trial was to assess the safety and tolerability of single and multiple IVT injections of NGM621 in patients with GA. Secondary objectives were to characterize the serum PK of single or multiple doses of NGM621. The trial enrolled 15 patients across three single-ascending dose cohorts of NGM621, 2 mg, 7.5 mg and 15 mg, the maximum planned dose in the study, and a multiple dose cohort that received two 15 mg doses separated by four weeks. Patients were dosed sequentially and followed closely over 12 weeks. All 15 patients completed the 12-week study follow-up period.

Data from the trial showed that NGM621 was well tolerated, with no patients experiencing SAEs, drug-related adverse events, intraocular inflammation, endophthalmitis or CNV. No dose-related safety patterns or concerns were identified. Ocular adverse events observed were mild in severity and representative of those commonly associated with IVT injections. No vision-related safety signals were detected. On average, patients maintained their visual acuity over the 12-week follow-up study duration.

We demonstrated in the Phase 1 trial that the serum PK of NGM621 was linear and dose proportional. NGM621 serum exposure was below concentrations expected to produce systemic complement inhibition after IVT injection of the 15 mg dose. Based on the data presented at AAO and our ocular PK and PD preclinical modeling suggesting that NGM621 may potentially achieve a greater than 90% reduction in free C3 in the eye for seven weeks following a single IVT dose of 15 mg, we believe NGM621 has the potential for up to an every eight-week (or every other month) dosing regimen at the 15 mg dose level.

NGM621 Phase 2 CATALINA Clinical Trial - Ongoing

We met with the FDA in August 2020 to discuss a potential regulatory path for NGM621. Following these discussions, we designed the Phase 2 CATALINA clinical trial to be a Phase 3-supportive or -enabling study. The primary objectives of this multicenter, randomized, double-masked, sham-controlled trial are to evaluate the efficacy and safety of NGM621 IVT injections compared to sham control. Patients will be randomized to one of four treatment groups in a ratio of 2:1:2:1 to receive IVT injections of NGM621 or sham every four weeks or every eight weeks for a total of 52 weeks and monitored for an additional four weeks upon treatment completion. The trial is designed to enroll 240 patients diagnosed with GA in one or both eyes in the Phase 2 CATALINA trial.

The primary efficacy endpoint is the rate of change in GA lesion area, as measured by fundus autofluorescence imaging, over 52 weeks of treatment. The primary safety endpoints will evaluate the incidence and severity of ocular and systemic adverse events from treatment with NGM621 compared to sham control.

Future NGM621 Clinical and Commercial Product Development Plans

The FDA has recognized the importance of developing therapies for GA and has defined a path for approval for agents that can safely and effectively reduce the rate of GA lesion area enlargement. The FDA has emphasized that for drug and biologic approvals the FDA has a clear preference for functional over anatomic endpoints, as these endpoints offer the lowest variability and matter most to patients, but the FDA recognizes that GA lesions represent non-seeing retina, where photoreceptors and RPE cells are absent, and that reducing the growth of these lesions reduces the rate of further functional loss. Assessing the presence and progression of GA from an anatomical perspective requires capturing standardized images and quantifying the total area affected, as well as the location of atrophy, particularly relative to the foveal center.

Our NGM621 clinical development approach is to use the results we obtain from our ongoing Phase 2 CATALINA trial and guidance from the FDA to inform Phase 3 planning and design. We expect that the

CATALINA trial results will provide important information to support our design of a pivotal program to enable a BLA submission.

NGM621 Patent Portfolio

As of December 31, 2020, we did not own or have a license to any issued patent that covers NGM621. However, NGM621 and related compositions-of-matter and methods of use are disclosed and claimed in patent applications pending in the United States and in multiple jurisdictions outside of the United States. Any patent that may issue from any of these pending applications would be expected to expire no earlier than 2039, including any patent issued in the United States, if any, not including any patent term adjustments and any patent term extensions.

Geographic Atrophy Competition

Current Treatments

There are currently no FDA-approved or EMA-approved medicines available to treat GA. Patients with GA have very limited options outside of clinical trial participation. They are observed by their ophthalmologist or retina specialist for the purposes of documenting disease worsening, through imaging and visual acuity testing, and to monitor for any conversion to wet AMD (which is treatable with anti-VEGFs). Some patients with GA take AREDS formula vitamins which have been shown to reduce the risk of progression to advanced forms of AMD; however, results from the AREDS trials have shown that there is no benefit to reducing the rate of existing GA progression. As their vision declines, patients with GA can receive visual rehabilitation and instruction on adaptive tools, like magnifiers, to help manage their disability as well as possible.

Treatments in Development

While there are a number of agents in clinical development for GA, the landscape can be subdivided into either agents targeting the complement pathway or agents targeting other pathways implicated in AMD pathogenesis. Most treatment approaches for GA have focused on reducing the rate of GA lesion area progression, as assessed by imaging. GA is a chronic, progressive disease and, currently, many believe that slowing the progression of disease requires treatment periods of at least 12 months to show a meaningful treatment benefit relative to sham control.

Product Candidates Pursuing a Complement Pathway Modulation Approach to Treat GA

Multiple complement inhibition therapies are under clinical evaluation in patients with GA, although to date no treatment has received regulatory approval in the United States for GA. For example, Apellis Pharmaceuticals, Inc.'s APL-2, a PEGylated peptide inhibitor of C3, is being investigated in an ongoing Phase 3 clinical trial, and IVERIC bio, Inc.'s Zimura®, a PEGylated aptamer inhibitor of complement C5, recently completed a Phase 2/3 clinical trial and has begun a second confirmatory Phase 3 trial. APL-2 and Zimura both demonstrated statistically significant reductions in the rate of GA lesion area growth in their respective Phase 2, or Phase 2/3 in the case of Zimura, trials. Other agents targeting the complement pathway include Ionis Pharmaceuticals, Inc.'s IONIS-FB-LRx, a factor B inhibitor in Phase 2 development; Hemera Biosciences, LLC's HMR59, a gene therapy in development that produces CD59 to inhibit the complement membrane attack complex formation; Gemini Therapeutics, Inc.'s complement factor H replacement agent in Phase 2 development; and Gyroscope Therapeutics Limited's gene therapy GT005, replacing CFI in patients with genetically defined GA in Phase 2 development. Previously, in 2017, Roche announced that lampalizumab, an inhibitor of factor D, a rate limiting enzyme in the alternative complement activation pathway, failed to meet the primary endpoint in two Phase 3 trials in GA.

Product Candidates Pursuing Other Mechanistic Approaches to Treat GA

There are multiple product candidates in development that target other pathways implicated in AMD pathogenesis, including HtrA1 inhibition (for example, RG6147 in Phase 2 development by Roche) and visual cycle modulators (for example, ALK001 in Phase 3 development by Alkeus Pharmaceuticals, Inc.). Additionally, there are stem cell products being developed with the potential to replace RPE cells in late-stage GA and with the intent of preserving or improving visual function. Most of these stem cell studies are in Phase 2 (for example, OpRegen in development by Lineage Cell Therapeutics, Inc.; CPCB-RPE1 in development by Regenerative Patch Technologies LLC; and ASP7217 in development by Astellas Pharma Inc.)

Therapeutic Area: Oncology

Our discovery research and early development teams have been focused on discovering and developing novel immunotherapies to treat cancer. Through deep interrogation of human biology and genetics, we have made several discoveries about the role of immune suppression, immune modulation and metabolic regulation in cancer. In the second half of 2020, we disclosed that we are developing NGM707 and NGM438, product candidates designed to treat cancer through myeloid reprogramming that reverses immune suppression in the tumor microenvironment by promoting the remodeling of the tumor's extracellular architecture that restricts T cell infiltration of the tumor cell mass. These two product candidates join NGM120, a proprietary antagonistic antibody that binds glial cell-derived neurotrophic factor receptor alpha-like, or GFRAL, and inhibits growth differentiation factor 15, or GDF15, signaling in NGM's oncology portfolio. NGM120 is being studied for the potential treatment of both cancer and cancer anorexia/cachexia syndrome, also referred to as CACS or cancer-related cachexia. Cachexia is not unique to cancer and is also commonly seen in patients suffering from other chronic debilitating diseases, such as chronic obstructive pulmonary disease and congestive heart failure.

NGM120 results from several discoveries made by our scientists related to the GDF15 pathway. In preclinical studies of NGM120, we have demonstrated that blocking the interaction between GFRAL and GDF15 can both reduce tumor-associated weight loss and slow tumor growth, potentially providing a novel treatment for cancer-related cachexia and cancer. We are currently conducting a Phase 1a/1b dose-finding clinical trial with two cohorts: a Phase 1a cohort evaluating NGM120 as a monotherapy in patients with select advanced solid tumors and a Phase 1b cohort evaluating NGM120 in combination with gemcitabine and Abraxane® (paclitaxel protein bound) in patients with metastatic pancreatic cancer. Enrollment in this Phase 1a/1b dose-finding trial is complete and we expect to report topline data in the second half of 2021. We recently initiated a placebo-controlled expansion of the Phase 1b portion of the trial testing NGM120 in combination with gemcitabine and Abraxane as first-line treatment in patients with metastatic pancreatic cancer to evaluate NGM120's effect on both cancer-related cachexia and cancer, building upon our experiences in the Phase 1a/1b trial.

NGM707 is a proprietary dual antagonist monoclonal antibody that inhibits Immunoglobulin-like transcript 2, or ILT2 (also known as LILRB1), and Immunoglobulin-like transcript 4, or ILT4 (also known as LILRB2). ILT2 and ILT4 are key myeloid and lymphoid checkpoints that may restrict anti-tumor immunity, enable tumors to evade immune detection and contribute to T-cell checkpoint resistance. ILT2 and ILT4 are upregulated on macrophages in the tumor microenvironment of certain patients with cancer who are non-responders to T-cell checkpoint inhibitor therapy and, therefore, may serve as T-cell checkpoint inhibitor resistance mechanisms. We expect to commence a first-in-human Phase 1 clinical trial of NGM707 in patients with advanced solid tumors in mid-2021.

NGM438 is a proprietary antagonistic antibody that is designed to inhibit leukocyte-associated immunoglobulin-like receptor 1, or LAIR1, and promote immune detection and activation against advanced solid tumors. Reinvigoration of collagen-suppressed immune cells by blocking the binding of collagens to LAIR1 may address a key resistance mechanism that limits solid tumor responses to current immunotherapies. We plan to make an IND submission in the second half of 2021. We expect to commence a first-in-human Phase 1 clinical trial of NGM438 in patients with advanced solid tumors in the fourth quarter of 2021.

Under the current terms of the Collaboration Agreement, Merck has a one-time option to license each of NGM120, NGM707 and NGM438 upon completion of a proof-of-concept study for each product candidate in humans.

Cancer Disease Overview

Cancer and the Promise of Immunotherapies

The term cancer refers to a variety of related cell proliferation diseases. In all types, cancer presents itself as the abnormal growth of cells, where cells have lost normal control mechanisms and, as a result, are able to multiply continuously, invade nearby tissues and migrate to distant parts of the body. Cancer is a leading cause of death globally and was responsible for an estimated 9.5 million deaths in 2018. There were an estimated 18 million newly diagnosed cancer cases around the world in 2018, excluding non-melanoma skin cancer. By 2040, the number of new cancer cases globally per year is expected to rise to 29.5 million and the number of cancer-related deaths per year to grow to 16.4 million. Cancer was the second leading cause of death in the United States, causing approximately 600,000 deaths in 2019.

Recent advances in cancer immunotherapy, including checkpoint inhibition, has ushered in a new era of cancer treatment. This innovation has been important; however, many patients and/or types of cancer remain unresponsive to currently approved therapies utilizing this approach. For example, since their introduction, immune checkpoint inhibitors targeting Programmed Cell Death Protein 1 and Programmed Cell Death Protein Ligand 1, or PD-1 and PD-L1, respectively, have driven significant improvements in clinical outcomes, especially in certain cancer types that are immunogenic, or capable of provoking an immune response. However, the overall response rate to PD-1/PD-L1 inhibitors is typically only 20-30%. Furthermore, given tumor heterogeneity and the complexity of cancer escape mechanisms that are still not fully understood, even patients with cancer who experience a full or partial response using checkpoint inhibitors may eventually experience cancer progression.

Over the last five years, we have focused our cancer research on immune-modulating therapies and we are currently developing an emerging class of molecules that inhibit myeloid- and stromal-checkpoints of the anti-tumor immune response. Cellular and noncellular interactions combine to suppress the immune response within a tumor, both enabling tumor growth and conferring resistance to therapies targeting cancer cells. When present in this type of suppressive tumor microenvironment, myeloid cells and stroma, which is comprised of connective tissue, can cooperate to inhibit anti-tumor immune responses using multiple mechanisms, including suboptimal T-cell priming, T-cell suppression and physical exclusion of immune cells from the cancer cells. By blocking these suppressive factors from the tumor microenvironment, myeloid cells can play a pivotal role in promoting anti-tumor immunity, where they can act to both kill cancer cells directly as well as recruit and activate T cells by secreting cytokines and inflaming the tumor.

Given the significant unmet need in cancer today, myeloid and stromal immune-checkpoint inhibitors may play an important role in future cancer treatments. By removing one of the “brakes” on the immune system using an approach that complements current treatments, new therapies may be able to reprogram myeloid cells in the tumor microenvironment from a suppressive to an activating phenotype. Such conditions would promote the anti-tumor immune response by converting “cold” tumors that are not immunogenic into “hot,” or inflamed, ones and make them more responsive to T-cell checkpoint inhibitors. We believe that reversing immune suppression by reprogramming myeloid cells represents a promising new therapeutic area of immuno-oncology that may enable the more effective treatment of certain cancers.

Cancer-Related Cachexia

Cancer-related cachexia is a disorder that causes extreme weight loss and muscle wasting that is debilitating and life-threatening and for which there is no FDA- or EMA-approved therapy. Cachexia is a common co-morbidity linked to many cancers and is associated with increased hospitalization and shortened survival compared to patients with cancer who do not exhibit cachexia. Cachexia is estimated to be the direct cause of approximately 30% of cancer deaths globally and is estimated to affect 60 to 80% of advanced cancer patients. Furthermore, studies have shown that patients with cancer who do not experience body weight loss have an improved prognosis. While cachexia can occur in all types of cancer, particularly high incidence rates are observed in pancreatic, non-small cell lung and gastric cancers, at 54%, 36% and 67% of patients, respectively. Elevated serum levels of GDF15 have been shown to be associated with cachexia.

Our Product Candidates

NGM120: A Potential Novel Treatment for Cancer-Related Cachexia and Cancer

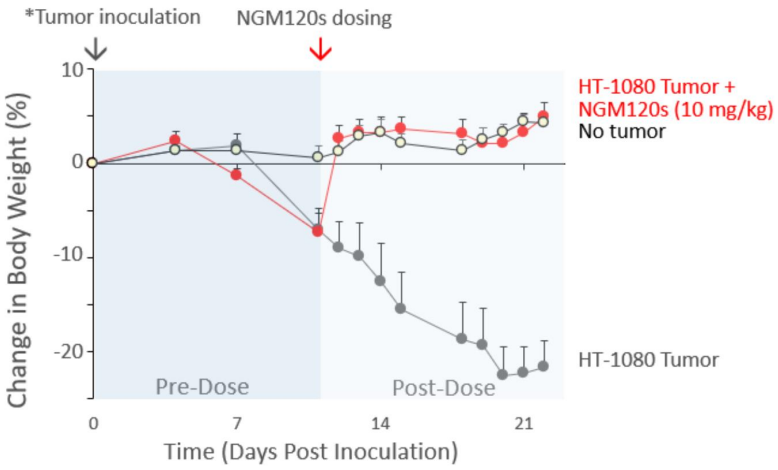
Overview of NGM120

Our scientists have made several discoveries related to GDF15, including identifying its cognate receptor, GFRAL. GFRAL is expressed in a specific region of the hindbrain, partially outside the blood brain barrier. Our preclinical research suggests the central role of the GDF15/GFRAL pathway in promoting tumor-associated appetite regulation, metabolic regulation and immune modulation. *In vivo* screening of human genes shows that GDF15 expression correlates to an outsized effect in weight loss and, in animal models, elevated serum levels of GDF15 drive substantial weight loss and are a regulator of feeding, metabolism and immune function. In addition, evidence has shown that serum levels of GDF15 are elevated in patients with numerous tumor types. Based on available scientific literature, increased serum levels of GDF15 are associated with a worse prognosis in prostate, colorectal, esophageal and ovarian cancers.

As a result of our identification of GFRAL, we developed novel insights into the mechanism of action of GDF15 and the structure and function of the GDF15/GFRAL interaction. NGM120 is a proprietary inhibitory antibody binding GFRAL that is designed to block the effects of elevated serum levels of GDF15. We designed

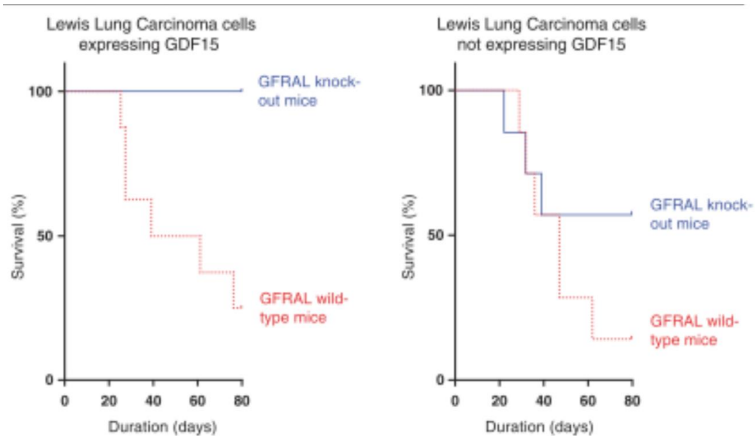
NGM120 as a potent, humanized monoclonal antibody inhibitor of GFRAL with the potential for once-monthly or less frequent dosing. In numerous preclinical pharmacology models, NGM120 has been shown to reverse and inhibit both GDF15-mediated body weight loss and increase in energy expenditure. For example, as demonstrated in the graph below, mice that received human fibrosarcoma cells (shown in the gray closed circles) rapidly lost significant body weight compared to the control mice who did not receive the fibrosarcoma cells (shown in the open circles). However, when treated with an anti-GFRAL antibody similar to NGM120 that is active in mice, called NGM120s, the body weight loss induced by the tumor cells was rapidly reversed in these mice (shown in the red closed circles).

A Murine Model of Cancer-Related Cachexia Syndrome



We also tested whether using inhibitory antibodies blocking the interaction between GFRAL and GDF15 could provide a novel approach to developing treatments for cancer. As shown in the graph below, in a preclinical study, Lewis Lung Carcinoma cells engineered to express human GDF15 were injected into GFRAL knockout and wild-type mice. The knockout mice were genetically modified to inactivate the GFRAL receptors, whereas the wild-type mice were capable of normal GFRAL receptor expression. Tumor-derived GDF15 appears to impact survival in mice in which the GFRAL signaling pathway is intact. In contrast, mice lacking GFRAL were resistant to the effects of elevated serum levels of GDF15. This indicates the potential for anti-GFRAL antibodies to improve patient survival in certain tumor types that express high levels of GDF15, in addition to potentially preserving body mass and preventing development of cachexia.

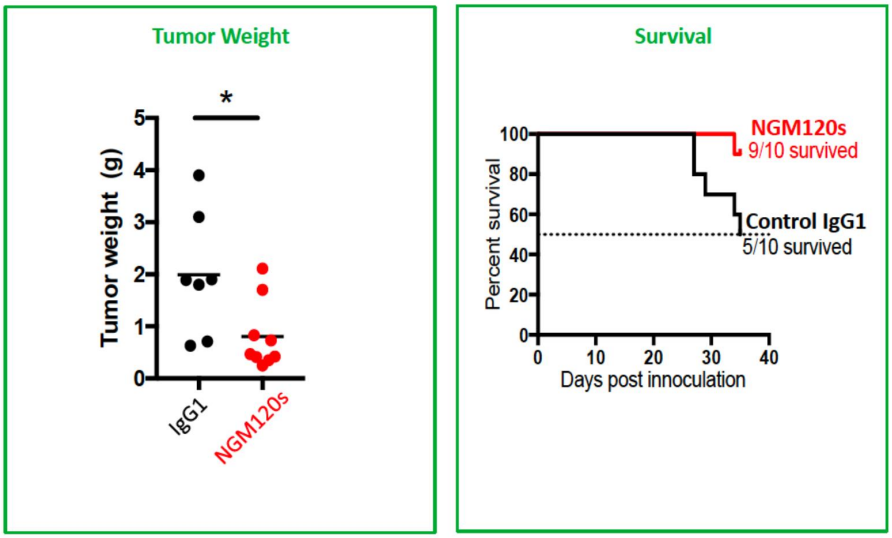
Impact of GDF15 on Survival in Mice Implanted with Lewis Lung Carcinoma Cells



We also saw the impact of anti-GFRAL antibodies when we implanted pancreatic tumor cells, which express GDF15, into the pancreas of mice and monitored tumor growth over time after treatment with NGM120s or a control. After 7 days, tumor growth was assessed, and 6 of 10 mice dosed with the placebo control had tumors while there were no detectable tumors in those treated with the anti-GFRAL antibody. After 14 and 21 days, tumors were detected in the anti-GFRAL treated mice, but the tumor burden was significantly reduced in these mice compared to mice treated with the control.

Additionally, as shown in the graph below, in a preclinical study of a pancreatic tumor model in mice, we observed that the control group demonstrated substantial tumor growth, while the animals who were treated with NGM120s demonstrated substantially reduced tumor growth. We also saw improved survival in the group of mice who received NGM120s.

NGM 120s Shown to Reduce Tumor Growth and Improve Survival in a Pancreatic Tumor Model in Mice



From our preclinical testing, we further believe that antibodies against GFRAL may be inherently superior to antibodies against GDF15. GDF15 expression can rise dramatically in response to tissue injury due to chemotherapy and many chronic debilitating diseases, such as cancer, chronic obstructive pulmonary disease and congestive heart failure, and may be too high to be effectively neutralized by an anti-GDF15 therapeutic antibody. Therefore, we believe that an inhibitory antibody that binds to GFRAL may provide a more efficient therapeutic approach. As a result of our extensive preclinical work, we believe that inhibitory antibodies blocking the interaction between GFRAL and GDF15 could provide a novel approach to developing treatments for anorexia, cachexia and, potentially, cancer.

Our Ongoing and Future NGM120 Clinical Development Plans

In 2019, we completed a Phase 1 single ascending dose (n=48) and multiple ascending dose (n=44) clinical trial assessing the safety, tolerability and PK of NGM120 in healthy adult subjects. NGM120 was well tolerated at all doses studied and the PK profile of NGM120 had a terminal half-life of approximately 35 days. There were two reported SAEs in the NGM120 treatment arms: renal colic and bipolar disorder, both of which were deemed by the investigators to be unrelated to treatment with NGM120, and no adverse events of note.

After completing the initial Phase 1 trial, in the first quarter of 2020, we initiated a Phase 1a/1b dose-finding clinical trial to assess NGM120's effect on cancer-related cachexia and on cancer. The Phase 1a/1b trial is divided into two cohorts: a Phase 1a cohort evaluating NGM120 as a monotherapy in patients with select advanced solid tumors and a Phase 1b cohort evaluating NGM120 in combination with gemcitabine and

Abraxane in patients with metastatic pancreatic cancer. Enrollment in this Phase 1a/1b trial is complete and we expect to report topline data in the second half of 2021.

In January 2021, we initiated a placebo-controlled expansion of the ongoing Phase 1b trial. This Phase 1b expansion study will evaluate the safety, tolerability and efficacy of NGM120 as first-line treatment in 60 patients with metastatic pancreatic cancer. Patients will be selected based on their elevated serum levels of GDF15. The study is a randomized, single-blind (sponsor unblinded), placebo-controlled, multi-center trial. Patients will be randomized 1:1 to receive either NGM120 or placebo monthly in combination with first-line standard of care treatment with gemcitabine and Abraxane. The study will have both cancer and cachexia endpoints, including overall response rate, progression-free survival, overall survival, body weight change, lean body mass change, patient reported outcomes and functional status changes.

NGM120 Patent Portfolio

As of December 31, 2020, we owned one issued patent in the United States, as well as pending patent applications in the United States and multiple jurisdictions outside of the United States, covering NGM120 and related compositions-of-matter and methods of use. The issued patent is expected to expire in 2037, not including any patent term adjustments and any patent term extensions.

NGM120 Competition

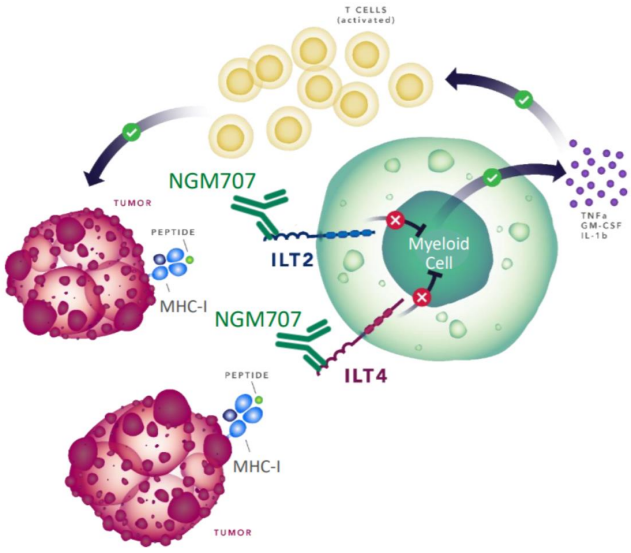
There are currently no FDA- or EMA-approved medicines available to treat cancer-related cachexia. Given the recent identification of GFRAL, we are not aware of any publicly disclosed program other than NGM120 that targets GFRAL. There are three recently initiated Phase 1 programs we are aware of that target GDF15: AVEO Pharmaceuticals, Inc.'s AV-380 and Pfizer's monoclonal antibody PF-06946860 are in Phase 1 assessing various cachexia-related measures; and CatalYm GmbH has initiated a Phase 1 clinical trial of CTL-002 in Europe to explore the treatment of cancer.

NGM707: Potential Myeloid Reprogramming Immunotherapy for Cancer

Overview of NGM707

NGM707 is a novel dual antagonist monoclonal antibody that is designed to improve patient immune responses to tumors by inhibiting both ILT2 and ILT4 receptors expressed on myeloid cells in the tumor microenvironment. NGM707 targets an epitope, or the part of a molecule to which an antibody attaches, common to both ILT2 and ILT4 to achieve inhibition of both receptors. NGM707 blocks interaction between ILT2 or ILT4 and their shared major histocompatibility complex, or MHC, class I ligands. We believe NGM707 has the potential to reprogram ILT4- and ILT2-expressing myeloid cells to shift them from a suppressive state that restricts anti-tumor immunity to a stimulatory state that may promote anti-tumor immunity. Blocking ILT2 also may reverse inhibition of ILT2-expressing lymphoid cells to further stimulate anti-tumor immune responses.

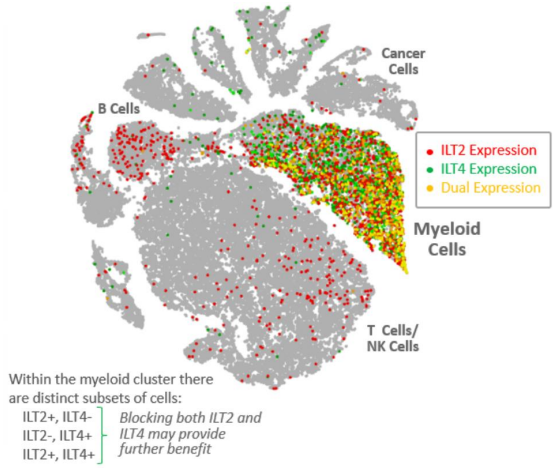
NGM707: A Dual Antagonist Antibody Inhibiting ILT2 and ILT4



MHC-1 = major histocompatibility complex – class I; TNF = tumor necrosis factor; IL = interleukin, GM-CSF = Granulocyte-macrophage colony-stimulating factor

ILT2 and ILT4 receptors expressed on myeloid cells in the tumor microenvironment are implicated in promoting a tolerogenic state, which induces immune tolerance that suppresses anti-tumor immune responses. These receptors may represent checkpoints that enable tumors to evade immune detection. Suppressive myeloid cells enriched with ILT2 and ILT4 receptors are upregulated in certain cancer types, ILT2 is also expressed on natural killer, or NK, cells, B cells and a subset of highly cytolytic T cells. Of note, ILT2 and ILT4 are upregulated on macrophages in the tumor microenvironment of certain patients with cancer who are non-responders to T-cell checkpoint inhibitor therapy and are therefore implicated as potential T-cell checkpoint inhibitor resistance mechanisms.

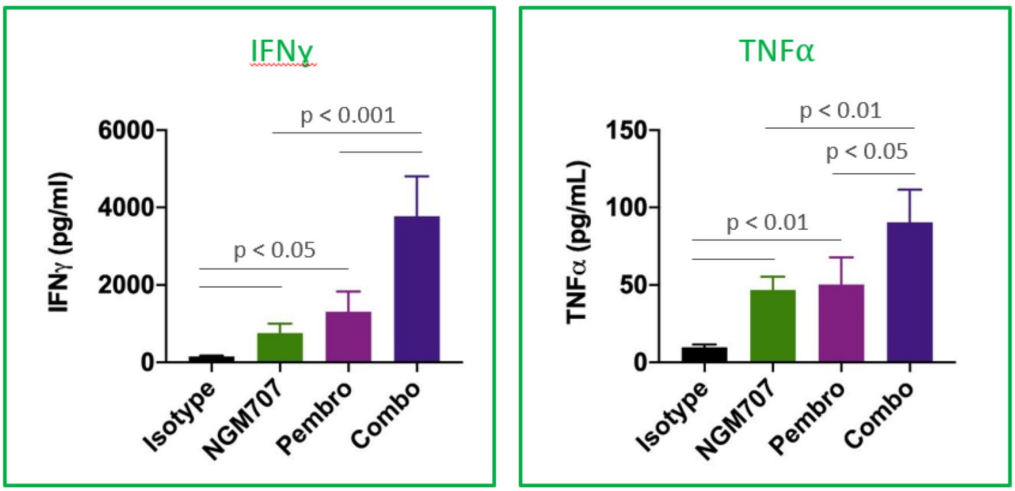
ILT2 and ILT4: Myeloid and Lymphoid Checkpoints



Preclinical studies of NGM707 suggest that blockade of ILT4 reverses myeloid cell immune suppression, while blockade of ILT2 activates macrophage phagocytosis of tumor cells and promotes NK and CD8+ T-cell

killing of tumor cells. Other preclinical studies of NGM707 have shown that the dual blockade of ILT2 and ILT4 acts synergistically to reverse suppression of Fc receptor signaling, a key stimulatory pathway in myeloid cells. In preclinical mixed lymphocyte reactions, in which allogeneic macrophages and T cells are mixed, the combination of NGM707 and pembrolizumab acted additively to increase T-cell activation and cytokine secretion as shown below.

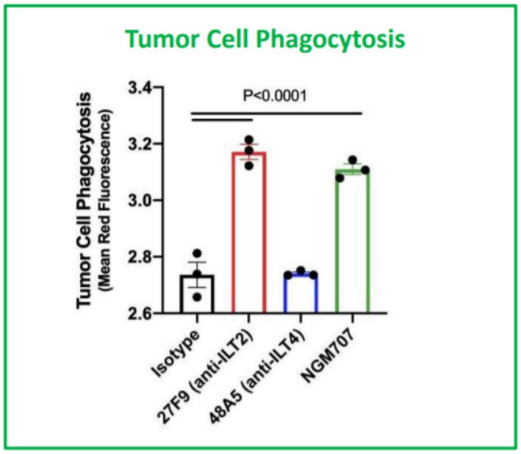
NGM707 and Pembrolizumab Shown to Act Additively to Enhance T Cell Activation *in Vitro*



IFNɣ = Interferon Gamma; TNFα = Tumor Necrosis Factor alpha, Pembro= pembrolizumab, Combo = pembrolizumab and NGM707

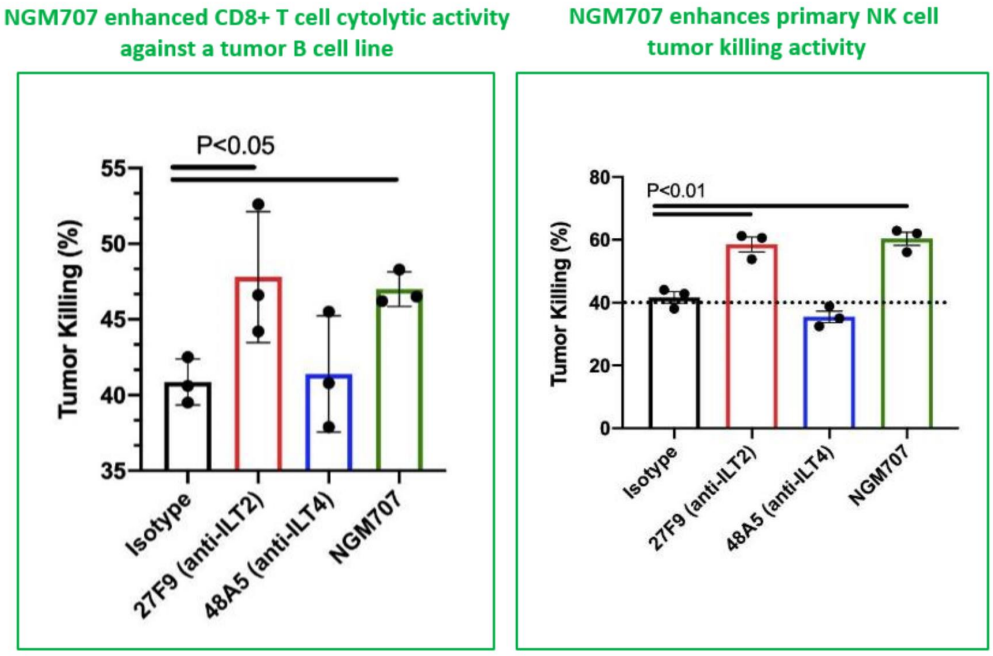
One of the primary activities that macrophages have in the tumor microenvironment is to attack any cancer cells. The graphic below shows that blocking ILT2 enhances phagocytosis of cancer cells by macrophages, while ILT4 blockade has no effect. Macrophage phagocytosis may increase tumor killing and potentially drive expansion of the immune response, or antigen spread.

ILT2 Blockade Shown to Enhance Macrophage Phagocytosis of Tumor Cells *in Vitro*



Unlike ILT4, ILT2 is also expressed on T cells and NK cells. An ILT2 blockade, using either an ILT2-specific antibody or NGM707, enhances the T cell killing of cancer cells in co-cultures; whereas an ILT4 blockade alone has no effect. Likewise, an ILT2 blockade, using either an ILT2-specific antibody or NGM707, enhances the natural killer cell, or NK cell, killing of cancer cells in co-cultures.

ILT2 Blockade Shown to Enhance CD8+ T Cell Cytolytic Activity and Primary NK Cell Killing Activity *in Vitro*



Our Future NGM707 Clinical Development Plan

We expect to commence a first-in-human Phase 1 clinical trial of NGM707 in patients with cancer in mid-2021. We expect the planned Phase 1a/b clinical trial will include two cohorts to evaluate the safety, tolerability and PK of NGM707 and to obtain preliminary evidence of any anti-tumor activity. The Phase 1a cohort is expected to evaluate NGM707 as a monotherapy, while the Phase 1b cohort is expected to evaluate NGM707 in combination with pembrolizumab in patients with advanced solid tumors. This open-label, Phase 1a/b trial is expected to be followed by a planned Phase 2 dose-expansion clinical trial in defined cohorts of specific tumor types.

NGM707 Patent Portfolio

As of December 31, 2020, we did not own or have a license to any issued patent that covers NGM707. However, NGM707 and related compositions-of-matter and methods of use are disclosed in pending United States provisional patent applications that we expect to use as the basis for U.S. non-provisional and international applications. Any patent that may issue from related applications is expected to expire no earlier than 2041, including any patent issued in the United States, if any, not including any patent term adjustments and any patent term extensions.

NGM707 Competition

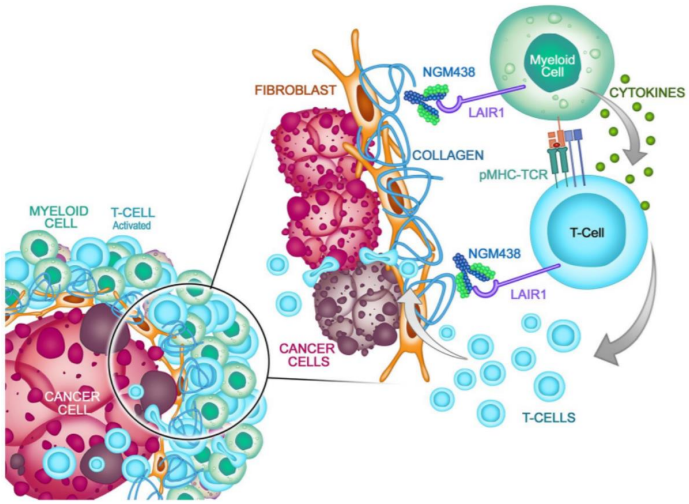
We believe NGM707 is the first and only candidate currently in development that targets both ILT2 and ILT4. However, there are several products in development that target either ILT2 or ILT4. Merck and Jounce Therapeutics, Inc., or Jounce, both have clinical stage anti-ILT4 programs. In September 2020, Merck presented findings from a Phase 1 dose-escalation study evaluating its investigational anti-ILT4 therapeutic candidate, MK-4830. Jounce is developing an anti-ILT4 monoclonal antibody, JTX-8064, and recently initiated enrollment in a Phase 1 clinical trial. We are aware of one preclinical anti-ILT4 candidate in development, Immune-Onc Therapeutics, Inc.'s, or Immune-Onc's, IO-108, and one ligand trap for ILT4 in preclinical development, ImmunOS Therapeutics AG's iosH2, which may also impact ILT2. Biond Biologics Ltd. currently has an antagonist antibody targeting ILT2, BND-22, which has been licensed by Sanofi, in development and plans to commence a Phase 1a trial in mid-2021. We are not aware of any other compounds in development targeting ILT2.

NGM438: Potential Stromal and Myeloid Reprogramming Immunotherapy for Cancer

Overview of NGM438

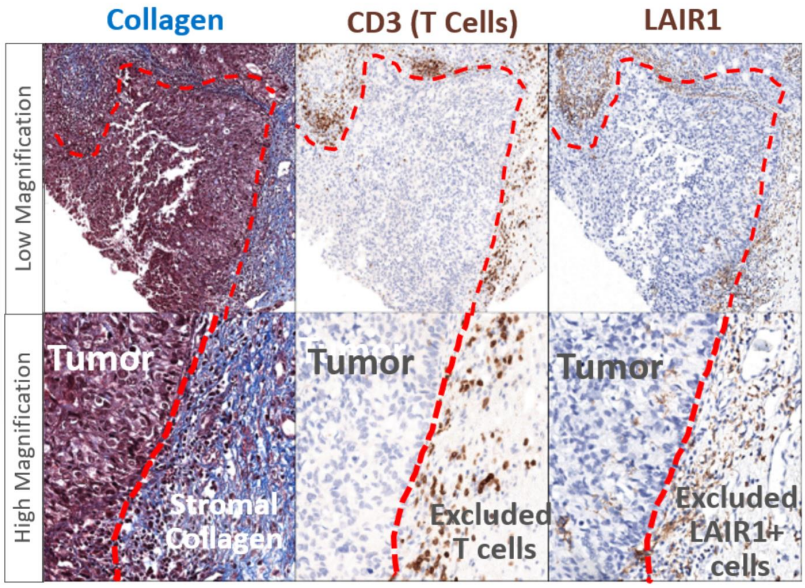
NGM438 is a novel antagonistic antibody that is designed to inhibit LAIR1 and promote immune detection and activation against advanced solid tumors. NGM438 has the potential to potently block the binding of all collagens to LAIR1, including tumor cell-derived collagens. Tumor cell-derived collagens are the endogenous forms of collagen produced by the tumor stroma that are believed to bind LAIR1 to create an immuno-suppressive tumor microenvironment. The interaction of tumor stromal collagens with LAIR1 on immune cells represents a “stromal checkpoint” that restrains anti-tumor immune responses. Reinvigoration of these collagen-suppressed immune cells by blocking the binding of collagens to LAIR1 may address a key resistance mechanism that limits tumor responses to current immunotherapies.

NGM438: An Antagonist Antibody Inhibiting LAIR1



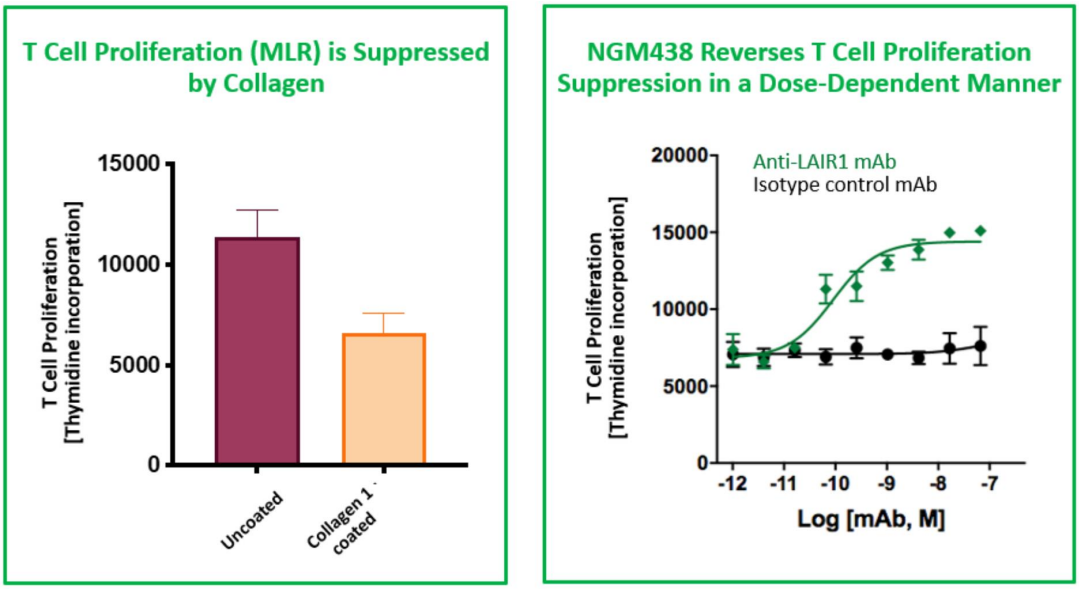
LAIR1 is a collagen-binding inhibitory receptor expressed on immune cells that is implicated in immune suppression. LAIR1 and collagens are upregulated in multiple cancer types, with LAIR1 being expressed on tumor-associated immune cells, and collagens being produced by tumor-associated stromal cells. Overexpression of collagens and LAIR1 is associated with poor responses to T-cell checkpoint inhibitors. For such tumors, formation of the collagen-LAIR1 complex may act as a stromal checkpoint to both physically exclude immune cells from the tumor and impose signaling-based immune suppression. Inhibiting this stromal checkpoint represents a potentially promising new therapeutic strategy to treat cancer by promoting the remodeling of the tumor architecture that restricts T-cell infiltration of the tumor cell mass and reversing immune suppression in the tumor microenvironment.

Immuno-Histochemical Identification of the Stromal Checkpoint in a Pancreatic Cancer Biopsy Sample



Preclinical studies suggest that NGM438 may have the potential to reprogram collagen-suppressed myeloid cells to a stimulatory phenotype, induce inflammatory cytokine production by myeloid and T cells and relieve collagen-based suppression of T-cell proliferation. For example, in a preclinical model as shown below, collagen suppressed T cell proliferation in mixed lymphocyte reactions, while the administration of NGM438 *in vitro* reversed this T cell suppression in a dose-dependent manner.

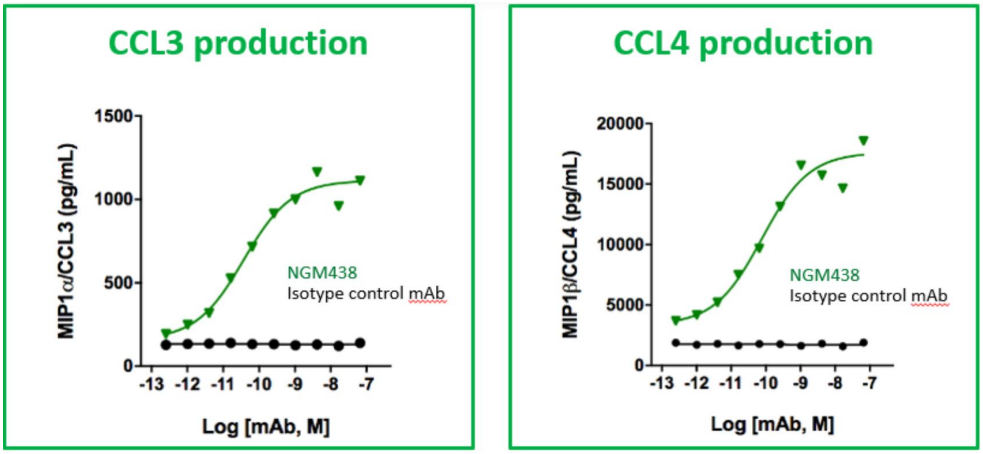
NGM438 Blockade Shown to Reverse Suppression of Myeloid Cells by Collagen Leading to Enhanced T Cell Proliferation *in Vitro*



MLR = Mixed Lymphocyte Reaction; mAb = monoclonal antibodies

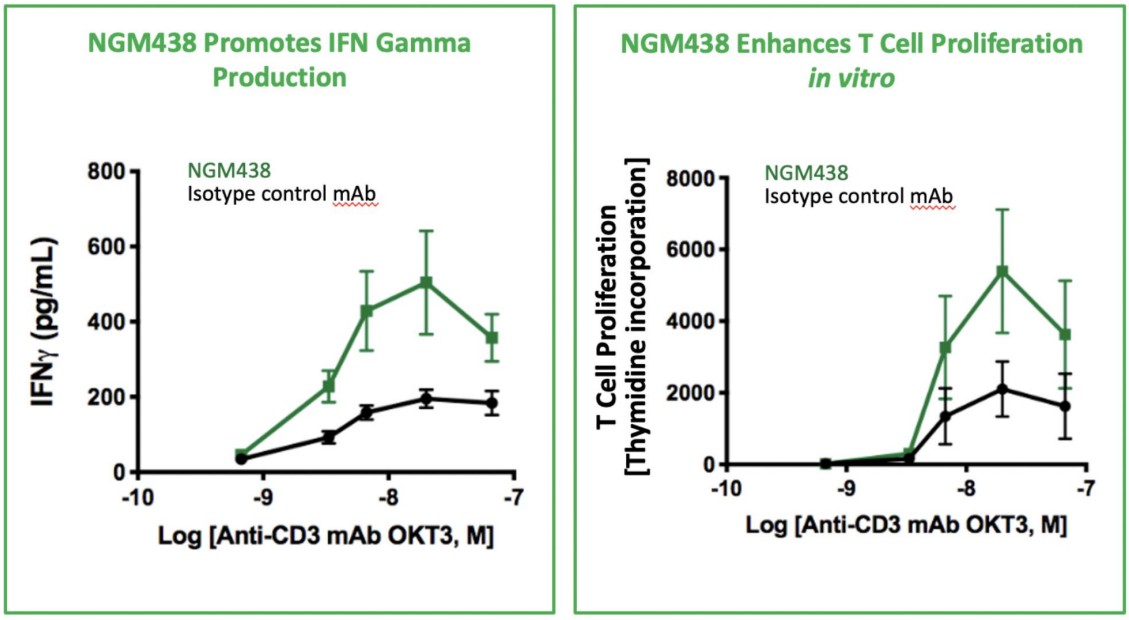
Collagen receptors, such as integrins, represent key stimulatory receptors on myeloid cells, and inhibition of these activating receptors via collagen-LAIR1 signaling promotes a suppressive myeloid cell phenotype. Preclinical studies of NGM438 demonstrate that blockade of collagen-LAIR1 binding reprograms myeloid cells to be pro-inflammatory and leads to a potent increase in secretion of cytokines, including CCL3 and CCL4, which are involved in recruiting lymphocytes to areas of inflammation.

NGM438 Shown to Reverse Collagen-Mediated Suppression and Induce Reprogramming in Myeloid Antigen Presenting Cells *in Vitro*



In the presence of collagen, T cells are suppressed and they respond poorly to stimulation by the T cell receptor with an anti-CD3 antibody. The low level of T cell activation, as measured by interferon-gamma production or T cell proliferation, is represented by the lines with circles in the two panels below. When LAIR1 is blocked with NGM438, reversal of the collagen-mediated inhibitory signaling of LAIR1 is observed, resulting in enhanced cytokine production (including interferon-gamma, left panel), as well as enhanced T cell proliferation (right panel).

NGM438 Shown to Enhance Inflammatory Cytokine Secretion and T Cell Proliferation in Collagen-suppressed T Cells *in Vitro*



Our Future NGM438 Clinical Development

We plan to make an IND submission in the second half of 2021 and expect to commence a first-in-human Phase 1 clinical trial of NGM438 in patients with cancer in the fourth quarter of 2021.

NGM438 Patent Portfolio

As of December 31, 2020, we did not own or have a license to any issued patent that covers NGM438. However, NGM438 and related compositions-of-matter and methods of use are disclosed in pending United States provisional patent applications that we expect to use as the basis for U.S. non-provisional and international applications. Any patent that may issue from related applications is expected to expire no earlier than 2041, including any patent issued in the United States, if any, not including any patent term adjustments and any patent term extensions.

NGM438 Competition

We are aware of only one other anti-LAIR1 antibody currently in development, Immune-Onc's preclinical-stage asset IO-106. NextCure, Inc. has a preclinical product candidate, NC410, a LAIR2 fusion protein designed to mimic the natural decoy effects of LAIR2, which binds to collagens and blocks the activity of LAIR1.

Our Collaboration with Merck

Overview

In 2015, we entered into the Collaboration Agreement with Merck covering the discovery, development and commercialization of novel therapies across a range of therapeutic areas, including a broad, multi-year drug discovery and early development program financially supported by Merck, but scientifically directed by us with input from Merck. The Collaboration Agreement contemplated an initial five-year research term, and Merck was granted the unilateral right to extend the research phase of the collaboration for two additional two-year terms. In March 2019, Merck exercised its first option to extend the research phase of the collaboration for two additional years through March 16, 2022.

Under the terms of the collaboration, Merck was required to notify us no later than March 17, 2021 of its unilateral decision whether to exercise its option to extend the research phase of the collaboration for an

additional two-year term through March 16, 2024. In March 2021, Merck initiated discussions with us with respect to elements of the ongoing collaboration that might be optimized to better address the evolving interests and priorities of both NGM and Merck during the remainder of the current research phase through March 16, 2022 and during any extension of the current research phase and any tail period (which tail period is discussed below). In this regard, the parties are negotiating in good faith certain modifications to the terms of the collaboration that may include, among other things, focusing NGM's research and development under the collaboration on therapeutic areas of particular interest to Merck, while enabling NGM to conduct research and development outside of these therapeutic areas. This would, if mutually agreed to, allow NGM to discover and develop product candidates on its own or with third parties in other areas of interest. In order to allow negotiations to proceed, the parties have agreed to extend the March 17, 2021 deadline for Merck to deliver its extension notification decision until June 30, 2021. While we cannot predict whether or when Merck will elect to extend the research phase of the collaboration or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the current research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms.

As a result of the ongoing negotiations between us and Merck, the parties may agree on modifications to the Collaboration Agreement and that the description of the terms of the Collaboration Agreement as set forth in this Annual Report on Form 10-K may be modified in some or all respects.

Under the Collaboration Agreement, we granted Merck options to take exclusive, worldwide licenses, on a program-by-program basis, for the collaboration product candidates as well as to other related compounds that are directed to the same target and that result in the same effect on such target in our research and development pipeline pursued using funding from the Collaboration Agreement. Merck generally has a one-time right to exercise its option for any collaboration product candidate when we or Merck complete a human proof-of-concept trial. If Merck exercises an option, Merck is responsible, at its own cost, for any further development and commercialization activities for compounds within that licensed program. In November 2018, Merck exercised its option to license MK-3655 and other FGFR1c/KLB agonists. In November 2020, Merck initiated a Phase 2b randomized, double-blind study of MK-3655 in patients with NASH with F2 or F3 liver fibrosis.

The aldafermin program is not included in the Collaboration Agreement and it remains wholly-owned and controlled by us.

The strategic value of our collaboration with Merck can be summarized as follows:

- ***Financial Support:*** Under the terms of the Collaboration Agreement, in 2015 Merck paid us an upfront cash licensing fee of $94.0 million and purchased approximately $106.0 million of our Series E convertible preferred stock. In addition to the upfront cash component, Merck initially committed to provide us research and development reimbursement of up to $50.0 million per year for at least five years. If our research and development expenses exceed $50.0 million in a given year and we are conducting IND-enabling or later-staged activities, Merck is required to elect either to reimburse up to an additional $25.0 million for use in funding IND-enabling or later-staged activities or to provide us with the equivalent value in in-kind services for preclinical and clinical development activities. Therefore, the total Merck reimbursement for our research and development activities could have reached $75.0 million per year through the first five years of the research phase, although it only did so beginning in our fiscal year ended December 31, 2019 due to increases in research and development expenses as a result of an increase in the number of collaboration product candidates and their progression to early- and mid-stage development. Under the current terms of the Collaboration Agreement, Merck is also required to pay a $20.0 million extension fee each time it elects to exercise its unilateral right to extend the research phase of the collaboration for an additional two-year term. As part of the extension of the research phase of the collaboration through March 16, 2022, Merck agreed to continue to fund our research and development

efforts up to $75.0 million each year consistent with the initial five-year term and, in lieu of a $20.0 million extension fee payable to us, Merck agreed to make additional payments totaling up to $20.0 million in support of our research and development activities during 2021 and in the first quarter of 2022. Merck also paid us a fee of $20.0 million in December 2018 in connection with the exercise of its license option for MK-3655. From inception of the collaboration through December 31, 2020, Merck has paid us $495.8 million under the Collaboration Agreement.

- ***Economic Opportunity:*** For each program that Merck licenses, Merck must pay us a $20.0 million fee. In addition, we have the right, at the start of the first Phase 3 clinical study for a compound in such licensed program, to elect to participate in a worldwide cost and profit share with Merck of up to 50%, as well as the option to co-detail the product, if approved, alongside Merck in the United States. If we elect to participate in the cost and profit share, subject to certain limitations, Merck has agreed to provide us with interest-bearing advances of, and/or assume, up to 25% of our share of the global development costs that Merck will recoup from our share of any profit ultimately resulting from sales of the approved drug or, if the drug is not approved, other compounds that reach commercialization and are subject to a cost and profit share. If we decide not to participate in the cost and profit share, Merck will owe us milestone payments based on the occurrence of certain clinical development, regulatory and commercial events and royalties as a percentage of global net sales at ascending low double digit to mid-teen percentage rates. Our option to participate in the late-stage development and commercialization costs of MK-3655 has not yet been triggered.

- ***A Sharing of Expertise:*** The collaboration allows us access to Merck's mid- and late-stage development expertise and the resources to enable large global trials and the global commercial and distribution capabilities that we believe our products will require.

- ***Independence and Control Provisions:*** We maintain control over the direction and execution of each collaboration research and development program through human proof-of-concept testing, allowing our research team the independence to seek the most promising candidates and flexibility to terminate, suspend or de-prioritize projects.

Summary of the Merck Collaboration Agreement

For purposes of this summary, we refer to the seven- or, if further extended by Merck, nine-year period from the time of inception of the Collaboration Agreement as the research phase of the collaboration.

Research and Early Development Program

Under the Collaboration Agreement, we conduct an extensive research and early development program, the goal of which is the identification, research and development, through human proof-of-concept studies, of multiple product candidates in various therapeutic areas. At the inception of the collaboration, we included in the collaboration all of our research and development programs, both those existing at the time the Collaboration Agreement was entered into and those we work on during the research phase, with the exception of the following: aldafermin, any other compounds that target FGFR4 and inhibit CYP7A1 expression (including variants or derivatives of FGF19) and any compounds that are covered by or within the scope of third-party license or option rights. We have determined the scientific direction and areas of therapeutic interest within the collaboration, with input from Merck, and we are primarily responsible for the conduct of all research, preclinical and early clinical development activities, through human proof of concept. We have made the final determinations as to which compounds to advance into and through initial clinical trials and which to progress into a human proof-of-concept study and the design of any such trials, with input from Merck through various governance committees.

The amounts of funding Merck is currently committed to providing us under the Collaboration Agreement to fund our research and development efforts during the current research phase is described above. Under the current terms of the Collaboration Agreement, if Merck elects to extend the research phase for an additional two years through March 16, 2024, the level of funding that Merck will provide to us during such extension may be negotiated at the time of the extension, subject to certain minimum and maximum funding limits based on a percentage of the then-existing funding. As noted above, however, we expect that if we are unable to reach agreement with Merck on the terms of a modified collaboration, which modified terms we expect would include meaningfully lower annual research support funding from Merck than as is currently being provided during the current two-year extension of the research phase, Merck will not elect to extend the research phase for an

additional two years through March 16, 2024. With two exceptions, Merck may not terminate its annual funding of the research and early development program prior to the end of the research phase of the collaboration. Those two exceptions are: (i) if we are acquired by a third party; or (ii) if we are in material uncured breach of our obligations under the research and early development program.

During the three-month period before the end of the research phase, Merck has the right to review our then-existing programs and to elect to designate one or more such programs for which we will be required to continue to conduct research and development for up to three years, referred to as the tail period. Merck will pay all of our internal and external costs for our work on such Merck-designated programs, up to certain funding caps that decrease over the tail period and are each a specified percentage of certain funding actually provided to us by Merck during the last 12 months of the research phase. Merck also has the right to take over such Merck-designated programs and conduct such research and development activities itself or in partnership with a third party, at its own cost, or to terminate the tail period after a specified notice period. If Merck terminates the tail period, it has the right to elect to transition to itself or a third-party partner, at its own cost, any clinical trials that are then being conducted in such Merck-designated programs. If we complete a human proof-of-concept trial in one of such Merck-designated programs during the tail period or if Merck or its third-party partner completes a human proof-of-concept trial in one of such Merck-designated programs during or after the tail period, then Merck will have a one-time right to exercise its option to an exclusive, worldwide license for the collaboration product candidate tested in the proof-of-concept trial and certain related molecules in that program. Merck will lose its option rights at the end of the tail period with respect to all programs for which no collaboration product candidate has completed a human proof-of-concept trial by such time, except for Merck-designated programs that Merck is continuing to use commercially reasonable efforts to research and develop.

When it was entered into, the Collaboration Agreement included an exclusive worldwide license to our existing GDF15 receptor agonist program. Effective May 31, 2019, Merck terminated its license to the GDF15 receptor agonist program, returning the NGM395 and NGM386 product candidates to us. As a result, the NGM395 and NGM386 product candidates, on which we have paused further development, are wholly-owned by us.

Merck Option to License NGM Programs

During the research phase, or during the tail period, if there is one, following completion of a proof-of-concept study for a particular product candidate, regardless of the results of such study, Merck has the one-time option to obtain an exclusive, worldwide license, on specified terms, to that product candidate, as well as to all other molecules that are directed against the same target and that result in the same effect on such target. We refer to any program for which Merck exercises such option a Merck Licensed Program. If Merck exercises its license option, Merck is responsible, at its own cost, for any further development and any commercialization activities for compounds within that Merck Licensed Program, subject to our options to cost and profit share worldwide, and to co-detail those compounds in the United States, as further described below. For each program that Merck licenses, Merck must pay us a one-time $20.0 million fee. In November 2018, Merck exercised its option for a license to further research and develop MK-3655 and other FGFR1c/KLB agonists and paid us a $20.0 million fee.

If Merck does not exercise its license option with respect to a particular compound and related program within a specified limited period of time, in most instances we retain all rights to research, develop and commercialize that compound and its related molecules on a worldwide basis, either alone or in partnership with a third party, subject to the payment to Merck of certain royalties on any commercial sales of any resulting product(s). The one exception is if Merck does not exercise its license option because it determines further development of the compound is not warranted for technical, safety or efficacy reasons and, if later in the research phase we again complete a proof-of-concept study with the same compound or a related compound, Merck's license option right would nonetheless apply to such compound for a specified limited period of time.

We will have the right to develop and commercialize, independently or with third party partners, collaboration product candidates from all programs where Merck has lost its option rights and we will not have any obligations to Merck for these collaboration product candidates other than an obligation to pay low single digit royalties to Merck on the net sales of such collaboration product candidates if they are successfully developed.

NGM Option to Elect Cost and Profit Share and Merck Financial Assistance

If Merck exercises its license option, then we have the option, for a specified limited period of time at the start of the first Phase 3 clinical trial by Merck for a compound in that Merck Licensed Program, to elect to participate in a worldwide cost and profit share with Merck on that compound. Where we exercise such an option, we refer to such compound as an NGM Optioned Product. As part of our election to exercise our option to participate in a cost and profit share, we also select the percentage share—up to 50%—that we desire to fund of the total global costs of developing and, if approved, commercializing that NGM Optioned Product. The percentage of any profits we will receive from sales of an NGM Optioned Product will be the same as the percentage share we elect to contribute to funding costs. Our right to participate in cost and profit sharing under the Collaboration Agreement is subject to the following limitation: if at the point in time when we are exercising our option for a compound the actual costs we have incurred across all NGM Optioned Products, plus the prospective costs allocated to us across all NGM Optioned Products, plus the costs we are electing to incur if we were to exercise our option for the compound, reaches $1.4 billion (if the research phase ends in 2022) or $1.8 billion (if the research phase is extended to 2024), then we will not be able to exercise our option on any further compounds from Merck Licensed Programs that Merck takes forward.

The Collaboration Agreement also provides that, following our election to enter into a cost and profit share on an NGM Optioned Product, Merck will advance to us and/or assume up to 25% of our share of the global development costs for that NGM Optioned Product. These advances/assumed costs are subject to the aggregate cap across all NGM Optioned Products over the course of the collaboration described above. We refer to the amount Merck advances/assumes as the Advanced Amount. All Advanced Amounts accrue interest, are treated as an accumulated but deferred cost that we owe to Merck and are recouped by Merck in full out of our share of any profits resulting from sales of that NGM Optioned Product before we are entitled to receive any of those profits. If an NGM Optioned Product fails to generate profit sufficient to repay the balance of the Advanced Amount, the balance will be carried forward and recouped in full out of our share of any profits resulting from sales of any subsequent NGM Optioned Product(s), even if we did not obtain any advances from Merck on our share of costs for such subsequent NGM Optioned Product(s). We are responsible for directly funding all global development and commercialization costs of an NGM Optioned Product that exceed any Advanced Amount.

Co-Detailing Rights in the United States

For each NGM Optioned Product, we also have the option to participate in a portion of the commercial promotion, which we refer to as co-detailing, alongside Merck by providing up to 25% of the total requisite details in the United States of that NGM Optioned Product by fielding our own commercial sales force. We are required to make this election for an NGM Optioned Product prior to that product receiving regulatory approval in the United States. The specifics of our participation in co-detailing will be determined by the parties according to guidelines set out in the Collaboration Agreement. If we elect to co-detail with Merck, our costs are included in the overall shared commercialization costs, but we do not share in any greater portion of the profits than we otherwise would be entitled to for that NGM Optioned Product.

Small Molecule Research and Development

Under our Collaboration Agreement we also granted Merck a worldwide, exclusive right to conduct research and development on, and to manufacture, use and commercialize, small molecule compounds identified or developed by Merck that have specified activity against any target that we are researching or developing under the research phase of the collaboration and that, but for use of our confidential and proprietary information, Merck would not have discovered. If Merck ultimately does not exercise its license option to a collaboration compound we have taken through a proof-of-concept study that is directed to any such target, Merck's research license for its own small molecule program with respect to such target will become non-exclusive, but it will retain an exclusive license to any small molecule compounds that it has, as of that time, identified and developed. Merck has sole responsibility for research and development of any of these small molecule compounds, at its own cost. We are eligible to receive milestone and royalty payments on small molecule compounds that are developed by Merck under such a license from us, in some cases at the same rates as those we are eligible to receive from Merck for a Merck Licensed Program originating from our own research and development efforts, provided that, but for use of our confidential and proprietary information, Merck would not have discovered such small molecule compounds. However, we do not have the option to cost and profit share or the option to co-detail those small molecule products.

Collaboration Governance

Our collaboration with Merck is managed by a set of joint committees composed of equal numbers of representatives from us and Merck. A joint research committee has been established to review and discuss the preclinical work that we are conducting and to solicit Merck's input on our research activities. Once we nominate a clinical candidate, a joint early development committee oversees and facilitates the conduct of preclinical and early development activities. For MK-3655 and any other Merck Licensed Program, a joint late development committee oversees and coordinates development. A joint commercialization committee will oversee the commercialization of any NGM Optioned Compound arising from a Merck Optioned Program. Decision making in these committees generally requires the agreement of both Merck's and our representatives, with unresolved issues escalating through to certain executive officers, and with us having the final say with respect to research and early development program matters and Merck having final say with respect to Merck Licensed Program matters and late development and commercialization matters following the exercise of its option for a particular program.

Diligence

We and Merck must each use commercially reasonable efforts to perform all of our respective activities under the collaboration.

Exclusivity

During the research phase, we may not directly or indirectly research, develop, manufacture or commercialize, outside of the collaboration, any product with specified activity against any target that we are researching or developing under the collaboration. After the research phase, if Merck exercises its license option for a collaboration program, we may not directly or indirectly research, develop, manufacture or commercialize any product with specified activity against the target that is the subject of that Merck Licensed Program for so long as Merck's license to that program remains in effect.

Financial Terms

In exchange for these various rights and access to our drug discovery approach, in 2015 Merck paid us an upfront cash fee of $94.0 million and purchased approximately $106.0 million of our Series E convertible preferred stock.

Under the current terms of the Collaboration Agreement, Merck is required to pay a $20.0 million extension fee each time it elects to exercise its unilateral right to extend the research phase of the collaboration for an additional two-year term. As part of Merck's first extension of the research phase of the collaboration in 2019, Merck agreed to continue to fund our research and development efforts up to $75.0 million each year consistent with the initial five-year term and, in lieu of a $20.0 million extension fee payable to us, during such two-year extension period Merck agreed to make additional payments totaling up to $20.0 million in support of our research and development activities during 2021 and in the first quarter of 2022.

Each time Merck exercises its license option following completion of a human proof-of-concept study, Merck is required to pay us an option fee of $20.0 million for such Merck Licensed Program. In December 2018, we received a $20.0 million payment from Merck in connection with the exercise of its license option for the MK-3655 program.

If we do not elect to enter into a cost and profit sharing arrangement for a compound we have licensed to Merck, we are eligible to receive an aggregate of up to $449.0 million in pre-commercial milestone payments, of which $77.7 million relates to the potential achievement of specific clinical development events and $371.3 million relates to the potential achievement of certain regulatory events with respect to the licensed compound for the first three indications in the United States, European Union, or EU, and Japan.

A breakout of the milestone payments in connection with the potential achievement of certain clinical development events is as follows (in thousands):

	First Indication	Second Indication	Third Indication
Upon administration of an applicable product to the first patient in the first Phase 3 clinical trial for such product for the given indication	$ 35,000	$ 25,250	$ 17,500

A breakout of the milestone payments in connection with the potential achievement of various regulatory events for each of the three indications, for each of the three geographic areas, is as follows (in thousands):

	First Indication	Second Indication	Third Indication	Total
United States	$ 75,000	$ 56,250	$ 37,500	$ 168,750
European Union	60,000	45,000	30,000	135,000
Japan	30,000	22,500	15,000	67,500
	$ 165,000	$ 123,750	$ 82,500	$ 371,250

We are also eligible to receive commercial milestone payments of up to $125.0 million payable for such licensed product and to receive royalties at ascending low double digit to mid-teen percentage rates, depending on the level of net sales Merck achieves worldwide for each licensed product.

If Merck does not exercise its license option to a compound and we commercialize that compound or its related molecules, we will owe Merck royalties on sales of those compounds at low single digit rates. If Merck exercises its license option but then terminates its license to a program, such as the GDF15 receptor agonist program, and we take compounds in that program forward, we also owe Merck royalties on sales of those compounds at low single digit rates.

Termination

After the research phase, Merck may terminate the overall Collaboration Agreement for convenience upon written notice. Subject to certain limitations, Merck may partially terminate the Collaboration Agreement for convenience as it relates to any Merck Licensed Program on written notice. Merck may also terminate the Collaboration Agreement as it relates to its rights to research and develop small molecule compounds.

Either we or Merck may terminate the Collaboration Agreement with respect to a specific Merck Licensed Program if the other party is in material breach of its obligations regarding that specific program and fails to cure the breach within the specified cure period. If Merck terminates a Merck Licensed Program as a result of our uncured material breach, then we would lose our option to participate in global cost and profit sharing if not yet exercised as of the time of termination and lose our co-detailing option (whether or not exercised as of that time) for compounds arising from the relevant Merck Licensed Program. Finally, if Merck terminates a Merck Licensed Program for our breach and there are no other Merck Licensed Programs at such time, then we would also be required to commence repaying any Advanced Amounts outstanding with respect to such NGM Optioned Products. If we had already exercised our option to participate in global cost and profit sharing of one or more NGM Optioned Products arising from the Merck Licensed Program as of the time of termination, the option would remain in effect.

If we terminate a Merck Licensed Program for uncured breach by Merck, or if Merck terminates a Merck Licensed Program for convenience, all licenses granted to Merck with respect to such program will terminate and Merck will assign to us all related regulatory filings and approvals, grant us an exclusive license under Merck's intellectual property related to the terminated program for use in the further development and commercialization of products arising under the terminated program, subject to the payment of a modest royalty back to Merck, and provide certain other transition assistance to us.

Merck also has the right to terminate the Collaboration Agreement as it relates to Merck's license to any particular licensed small molecule compound for convenience or for an uncured material breach by us on written notice. We in turn have the right to terminate if Merck has failed to cure any material breach as it relates to any licensed small molecule compound. If Merck terminates for convenience, or we terminate for such breach by

Merck, all licenses to Merck with respect to the relevant small molecule compound terminate, but Merck retains all interest in and to the actual small molecule compound it had developed. If Merck terminates for our uncured material breach, we would continue to receive the full amount of milestones and royalties we were otherwise eligible for with respect to the relevant small molecule compounds, but we would lose our rights to participate in the various governance committees as they relate to those small molecule compounds.

Effect of our Change in Control and Certain Competitive Acquisitions

If we undergo any change in control, which includes the acquisition of us by any third party, the sale of all or substantially all of our assets relating to the Collaboration Agreement to a third party, or the sale of more than 50% of our voting stock to a third party, Merck has the right to terminate our research and early development program, in its entirety, or only with respect to certain of the programs then being pursued. If it does so, all funding for the terminated programs would cease, and we would transition, at Merck's expense, to Merck any clinical studies then being conducted by us, if directed by Merck. If Merck takes over the studies, it would continue to have the option to license a particular program upon completion of the first proof-of-concept study, but if Merck ceases development of the compounds prior to such proof-of-concept study, the program would revert back to us and Merck would have no further rights.

If our change in control involves another pharmaceutical company with significant annual sales of pharmaceutical products, which we refer to as a Pharma Acquisition, Merck would have certain additional rights that could only be exercised within the first year following the Pharma Acquisition. These include: limiting our right to cost and profit share; Merck ceasing to provide any additional Advanced Amounts with respect to one or more Merck Licensed Programs; requiring us to repay any or all then-outstanding Advanced Amounts, plus interest, in installments; and termination of our co-detailing rights. Merck would also have the right following any Pharma Acquisition to terminate or restrict our participation on the various governance committees and to limit the information it provides to us to higher level summaries.

If our acquirer in the event of a change in control is at that time pursuing research, development, commercialization or manufacturing of, or otherwise has any rights to, any compounds that modulate a target that is the subject of an Merck Licensed Program, which we refer to as a Competing Mature Program, Merck also has certain rights, unless our acquirer elects to cease those research, development and commercialization activities. These rights include: Merck ceasing to provide any additional Advanced Amounts with respect to any compounds arising from the Merck Licensed Program that have the same target as the Competing Mature Program; requiring us to repay any or all then-outstanding Advanced Amounts, plus interest, in installments, with respect to any compounds arising from that Merck Licensed Program; termination of our co-detailing rights with respect to the relevant compounds; termination of our participation in governance committees with respect to those compounds; and restrictions on the information we receive from Merck with respect to the compounds. However, our rights to share in costs and profits with respect to any such compounds, if exercised, would remain in effect, as would any milestone or royalty payment obligations of Merck with respect to the compounds.

In addition, if our acquirer in the event of a change in control is at that time researching, developing, manufacturing or otherwise has rights to any compounds that modulate a target that is also being actively pursued under our research and early development program, and which has not reached the proof-of-concept study stage but is ready for preclinical development, which we refer to as a Competing Early Program, Merck has the right to require us to select either: to provide information demonstrating that the Competing Early Program does not actually modulate the relevant target in the same manner as our candidate; to contribute the Competing Early Program to our collaboration with Merck as though it had originated under our research and early development program; or to divest the Competing Early Program. If we contribute the Competing Early Program to our collaboration with Merck, all the same financial obligations of Merck would apply, and we would retain all of our option rights with respect to the relevant compounds if Merck exercises its license option when the first compound arising under the program completes the first proof-of-concept study.

Past Equity Investments by Merck

Concurrently with the execution of our Collaboration Agreement with Merck, we entered into a stock purchase agreement with Merck for the purchase of 8,833,333 shares of our Series E convertible preferred stock, for an aggregate purchase price of approximately $106.0 million. In addition, concurrent with the closing of our initial public offering, or IPO, in April 2019, we issued 4,121,683 shares of our common stock to Merck in a private placement at a price of $16.00 per share for proceeds of $65.9 million, which resulted in Merck owning

approximately 19.9% of our outstanding shares as of the time of the IPO. If Merck elects to further extend the research phase of our collaboration until March 17, 2024, it has the option to purchase an additional $5.0 million of our common stock at a price per share equal to the last closing price of our shares on the date it notifies us of its desire to exercise such option, with such option subject to an overall cap on Merck's ownership interest of 19.9%.

Manufacturing

We do not own, and have no plans to establish, any manufacturing facilities. We currently use third-party contract development and manufacturing organizations or contract manufacturing organizations, which we refer to collectively as CMOs, to manufacture and supply all of the raw materials, drug substances and drug products for our research and development programs, including all the clinical trial materials used in the clinical trials of our clinical-stage product candidates. We have established relationships with several CMOs, including Lonza Ltd. The activities of our CMOs are overseen by an experienced group of employees and third-party consultants.

We plan to continue to rely on CMOs to manufacture commercial quantities of any products for which we successfully obtain regulatory approval, as well as to provide packaging, storage and distribution of any approved products. We have not entered into long-term clinical or commercial supply agreements with any of our CMOs. In addition, each of our product candidates relies on a single contract manufacturer for supplies of its drug substance and drug product.

Sales and Marketing

We do not currently have any approved products and do not expect to have any approved products in the near term. As a result, we have no marketing, sales or commercial product distribution capabilities.

In order to commercialize any of our wholly-owned product candidates that successfully obtain regulatory approval, we must either develop a sales and marketing infrastructure or collaborate with third parties that have sales and marketing experience. If we expect that the indication or indications for which we are seeking approval for a particular product candidate have a relatively small number of prescribing physicians for the relevant patient population, we may elect to establish a commercialization structure to market and sell that product if it is approved, particularly for the U.S. market. If, however, a product would benefit from the support of a large sales and marketing force or for markets outside of the United States, we plan to seek support through partnerships with large pharmaceutical or biotechnology companies or companies with established commercialization capabilities in territories outside the United States.

For product candidates subject to the Merck collaboration that are optioned by Merck, Merck will be responsible for all commercialization activities for any resulting approved product, subject to our option to co-detail such product in the United States. If we elect to exercise our co-detail option, we will need to develop a U.S.-based commercial sales force to support those efforts.

We do not expect to make the decision about whether to establish a commercialization infrastructure for any wholly-owned approved products or to establish a U.S.-based commercial sales force in connection with the exercise of our co-detail option for a Merck optioned approved product until shortly before the time such products are approved for commercial sale, if they are approved at all.

Competition

The biopharmaceutical industry is characterized by intense competition and rapid innovation. Although we believe that we hold a strong position in research in certain areas of liver and metabolic diseases, retinal diseases and cancer, our competitors may be able to develop other compounds or drugs that are able to achieve similar or better results. Our competitors include multinational pharmaceutical companies, specialized biotechnology companies, universities and other research institutions. Smaller or earlier-stage companies also may prove to be significant competitors, particularly through collaborative arrangements with large, established companies. We believe the key competitive factors that will affect the development and commercial success of our product candidates are their efficacy, safety and tolerability profile, and reliability.

There are many pharmaceutical companies, biotechnology companies, public and private universities and research organizations actively engaged in the research and development of products that may be competitive to our products. A number of pharmaceutical companies, including AbbVie, Allergan, AstraZeneca,

Bayer, Boehringer Ingelheim, Bristol-Myers Squibb, Eisai, Eli Lilly, GlaxoSmithKline, Johnson & Johnson, Merck, Novartis, Novo Nordisk, Pfizer, Roche, Sanofi and Takeda, as well as large and small biotechnology companies such as 89Bio, Akero, Albireo, Alentis, Amgen, Apellis, Ascletis, Axcella, AVEO, Biond, Bird Rock, Can-Fite, CatalYm GmbH, Cirius, Enanta, Galectin, Galmed, Genfit, Gilead, Glympse, Immune-Onc, ImmunOS, Immuron, Intercept, Inventiva, Iveric, Jounce, Madrigal, MannKind, MediciNova, Metacrine, Mirum, Nalpropion, NextCure, North Sea, Promethera, Salix, Scholar Rock, Seal Rock, Terns, Tiziana, Viking and Vivus, are pursuing the development or marketing of pharmaceuticals that target the same diseases that we are targeting. It is probable that the number of companies seeking to develop products and therapies for the treatment of liver and metabolic diseases, retinal diseases and cancer will increase. For example, we are aware of other companies, including Enanta, Gilead, Intercept, Metacrine, Novartis and Terns that are seeking to develop FXR agonist drug candidates that modulate FGF19 for the treatment of NASH. Additionally, we are aware that Apellis is seeking to develop a PEGylated peptide inhibitor of C3 for GA. Many of these and other existing or potential competitors have substantially greater financial, technical, human and other resources than we have and may be better equipped to develop, manufacture and market technologically superior products. In addition, many of these competitors have significantly greater experience than we have in undertaking preclinical studies and human clinical trials of new pharmaceutical products and in obtaining regulatory approvals of human therapeutic products. Accordingly, our competitors may succeed in obtaining FDA approval for superior products or for other products that would compete with our product candidates. In addition, other technologies or products may be developed that have an entirely different approach or means of accomplishing the intended purposes of our products, which might render our technology and products noncompetitive or obsolete.

For more information regarding the competition that our most advanced product candidates face, or may face, see the discussion of specific competition for each product candidate in “Business—Key Therapeutic Areas and Pipeline Programs” above.

Intellectual Property

Our intellectual property is critical to our business and our success depends, in part, on our ability to obtain and maintain intellectual property protection for our product candidates, technology and know-how, to defend and enforce our intellectual property rights, in particular, our patent rights, to preserve the confidentiality of our trade secrets and to operate without infringing the proprietary rights of others.

We seek to protect the proprietary technology that we believe is important to our business through a variety of methods, including seeking and maintaining patents and patent applications intended to cover our product candidates, their compositions, their methods of use and the processes for their manufacture and any other aspects of inventions that are commercially important to the success of our business. We seek to obtain domestic and international patent protection and, in addition to filing and prosecuting patent applications in the United States, we may file counterpart patent applications in additional countries where we believe such foreign filing is likely to be beneficial.

As of December 31, 2020, our patent portfolio includes over 500 patents and applications, including over 40 issued U.S. patents and over 40 pending U.S. patent applications covering our product candidates, certain aspects of our proprietary technology, and related inventions and improvements. Our patent portfolio also includes over 400 patents and patent applications in jurisdictions outside of the United States that, in many cases, are counterparts to our U.S. patents and patent applications. A description of the patents and patent applications relating to our six most advanced product candidates are described above. The patent landscape surrounding our product candidates is crowded, and we do not know if our pending patent applications will be issued with the claims we are seeking or if our issued patents will withstand challenges from third parties.

Not all patent applications result in the issuance of patents. Patent applications in the United States and certain other jurisdictions are maintained in secrecy for 18 months or potentially longer, so public disclosure of discoveries via the publication of patent applications or in the scientific literature is often delayed. As a result, we cannot be certain of the priority of inventions covered by our patent applications and may be subject to claims of priority from third parties or the United States Patent and Trademark Office, or USPTO, against which we will need to defend ourselves.

In addition, the scope of claims that may be allowed in any granted patent may be significantly reduced from the coverage claimed in the initial patent application. Further, the scope of the claims in an issued patent may be reinterpreted and, in some cases, narrowed or even cancelled after issuance by courts upon review. In

addition, many jurisdictions allow third parties to challenge issued patents in administrative proceedings which may result in further narrowing or cancellation of patent claims. As a result, even issued patents may not provide sufficient protection from competitors.

When patents are issued, the term of each individual patent will depend on the legal term for patents in the countries in which it is granted. In most countries, including the United States, the patent term is 20 years from the earliest claimed filing date of a non-provisional patent application in the applicable country. The actual term of any patent that may issue from the above-described patent applications claiming one of our product candidates could be longer than described above due to patent term adjustment or patent term extension, if available, or shorter if we are required to file terminal disclaimers.

Any changes we make to the composition, formulation, method of delivery or other attributes of our current and future product candidates to cause them to have what we view as more advantageous properties may not be covered by our existing patents and patent applications, and we may be required to file new applications and/or seek other forms of protection.

Even if patents are issued, if a third party engages in activities covered by valid claims of our patents, we may be required to engage in enforcement actions in the courts to enforce our patents. Not all enforcement proceedings are successful. We also must take care not to infringe the valid patents of third parties. Third-party patent rights that purport to cover our product candidates or their discovery, use or manufacture may require us to challenge their validity in court or administrative proceedings and prevail in such challenges, to alter our development or commercial strategy or our product candidates or their uses and manufacture, to obtain licenses to such patents and/or to stop certain activities altogether. We hold various licenses with third parties to their intellectual property, including those with Horizon Discovery Ltd., or Horizon, and Lonza Sales AG, or Lonza, described below. The patent positions of biotechnology companies like ours are generally uncertain and involve complex legal, scientific and factual questions. We may not obtain or maintain adequate patent protection for any of our programs and product candidates. For more discussion of the risks related to our patents and patent applications and our intellectual property generally, see "Risk Factors - Risks Related to Our Intellectual Property" in Part I, Item 1A of this Annual Report on Form 10-K.

In addition to patent protection, we also rely on trademark registration, trade secrets, know how, other proprietary information and continuing scientific innovation to develop and maintain our competitive position. We seek to maintain the confidentiality of proprietary information to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection. As a part of these efforts, 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 their respective relationships with us. These agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. Our agreements with employees also provide that all inventions conceived by the employee in the course of employment with us or from the employee's use of our confidential information are our exclusive property. Although we take these and other steps to safeguard our proprietary information and trade secrets, these agreements may be breached or 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 proprietary information that is not otherwise protect by patent. For information regarding the risks related to our intellectual property, see "Risk Factors - Risks Related to Our Intellectual Property."

Licensing Arrangements

Horizon License

In September 2019, we entered into a license agreement with Horizon in which we obtained a non-exclusive, non-transferable and non-sub-licensable license to use their proprietary GS knockout CHO K1 manufacturing cell line. We refer to this license as the Horizon License. The Horizon License will continue for ten years and allows us to manufacture and commercialize any current or future product candidates within the contractual term, including our product candidates that are currently subject to our collaboration with Merck.

Pursuant to the Horizon License, we paid Horizon a one-time, non-creditable and non-refundable license fee of $1.2 million, of which 50% was reimbursed by Merck. We are also subject to a license fee of $200,000 for

each future strategic partner. We have the right to terminate the Horizon License upon written notice to Horizon and each party may also terminate the Horizon License in the event of the other party's uncured material breach.

Lonza License

In October 2014, we entered into a Multi-Product License Agreement, or the Lonza License, with Lonza under which we obtained a worldwide, non-exclusive license to use Lonza's glutamine synthetase gene expression system, known as GS Xceed™, to manufacture and commercialize our proprietary products, including our product candidates that are currently subject to our collaboration with Merck.

Pursuant to the Lonza License, we paid Lonza an upfront fee of £250,000. Upon the initiation of the first Phase 2 clinical trial, the first Phase 3 clinical trial and the first commercial sale of any product manufactured using GS Xceed™, we are required to pay Lonza one-time milestone payments of £100,000, £100,000 and £150,000, respectively. We are also required to pay low single-digit royalties to Lonza based on net sales of any product manufactured using GS Xceed™. Our royalty obligation to Lonza continues on a product-by-product basis until the later of the expiration of the last-to-expire licensed patent or ten years after the first commercial sale of the product. We are also required to pay an annual license fee to Lonza of up to £300,000 per product if a party other than Lonza, we, our affiliates or our strategic partners (including Merck) manufactures certain product candidates for commercial activities. We are currently required to pay this fee for MK-3655 and NGM120. In accordance with the Lonza License, for certain additional product candidates, we are instead required to pay an annual license fee to Lonza of £25,000 per product candidate prior to the initiation of clinical development, and following the initiation of clinical development, £100,000, £150,000 or £300,000 annually per product candidate, respectively, if such product candidate is in a Phase 1, Phase 2 and Phase 3 clinical trial. We are currently required to pay this fee for NGM621.

The Lonza License continues until the expiration of the royalty term. We have the right to terminate the Lonza License upon written notice to Lonza. Each party may terminate the Lonza License for the other party's uncured material breach or bankruptcy. In addition, Lonza may terminate the Lonza License if we participate in the opposition or challenge of any Lonza patent or patent application licensed to us under the Lonza License.

Government Regulation

Product Approval in the United States

The FDA and other regulatory health authorities at federal, state and local levels, as well as in foreign countries as described in more detail below, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring and post-approval reporting of biologics, such as those we are developing. We, along with third-party contractors, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies and health authorities of the countries in which we wish to conduct studies or seek approval or licensure of our product candidates.

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

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA's current Good Laboratory Practice, or cGLP, regulation;
- submission to the FDA of an IND, which must become effective before clinical trials may begin and must be updated annually or when significant changes are made;
- approval by an independent Institutional Review Board, or IRB, at each clinical site before a trial is commenced;
- performance of adequate and well-controlled human clinical trial(s) to establish the safety, purity and potency of the proposed biologic product candidate for its intended purpose;
- preparation of and submission to the FDA of a BLA after completion of all pivotal clinical trials, including payment of substantial fees under the Prescription Drug User Fee Act, or PDUFA;

- a determination by the FDA within 60 days of its receipt of a BLA to file the application for review;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the proposed product is produced to assess compliance with current Good Manufacturing Practices, or cGMP, and to assure that the facilities, methods and controls are adequate to preserve the biological product's continued safety, purity and potency, and of selected clinical investigation sites to assess compliance with current Good Clinical Practices, or cGCP;
- 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 to permit commercial marketing of the product for specific indications for use in the United States.

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 following approval may subject an applicant to administrative actions or judicial sanctions. These actions and sanctions could include, among other actions, the FDA's refusal to approve pending applications, withdrawal of an approval, license revocation, a clinical hold, untitled or warning letters, voluntary or mandatory 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 fines or penalties. Any agency or judicial enforcement action could have a material adverse effect on our business, the market acceptance of our products and our reputation.

Preclinical and Clinical Development

Prior to beginning the first clinical trial with a product candidate, an IND sponsor must submit an IND to the FDA. An IND is a request for authorization from the FDA to administer an IND product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for clinical studies. The IND also includes results of animal and *in vitro* studies assessing the toxicology, PK, pharmacology and pharmacodynamic characteristics of the product; chemistry, manufacturing and controls information; and any available human data or literature to support the use of the investigational product. An IND must become effective before human clinical trials may begin. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises concerns or questions regarding safety or conduct of the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can begin. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with cGCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical trials are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. Furthermore, an IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial begins at that site and must monitor the study until completed.

Phase 1, Phase 2, Phase 3 and other types of clinical trials may not be completed successfully within any specified period, if at all. The FDA, an IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some trials also include oversight by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board or committee, which provides authorization for whether a trial may move forward at designated checkpoints based on access to certain data from the trial and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

For purposes of BLA approval, human clinical trials are typically conducted in three sequential phases that may overlap.

- ***Phase 1—***The investigational product is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, the side effects associated with increasing doses and, if possible, to gain early evidence on effectiveness.

- ***Phase 2—***The investigational product is administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.

- ***Phase 3—***The investigational product is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval.

In some cases, the FDA may require, or companies may voluntarily pursue, additional clinical trials after a product is approved to gain more information about the product. These are called Phase 4 studies and may be made a condition to approval of the BLA. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication and are commonly intended to generate additional safety data regarding use of the product in a clinical setting or in some cases to support full approval for products that are approved via an accelerated pathway as described below. Concurrent with clinical trials, companies may complete additional animal studies and develop additional information about the biological characteristics of the product candidate and must 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 candidate and, among other things, for biologics, must develop methods for testing the identity, strength, quality, purity and potency of the product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

BLA Submission and Review

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, nonclinical studies and clinical trials are submitted to the FDA as part of a BLA requesting approval to market the product for one or more indications. The BLA must include all relevant data available from pertinent preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls and proposed labeling, among other things. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data. The submission of a BLA requires payment of a substantial application user fee to FDA, unless a waiver or exemption applies.

Once a BLA has been submitted, the FDA generally makes a decision on the acceptance of the application for filing within 60 days of receipt. The FDA's goal is to review standard applications within ten months after it accepts the application for filing, or, if the application qualifies for priority review, six months after the FDA accepts the application for filing. In both standard and priority reviews, the review process is often significantly extended by FDA requests for additional information or clarification. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. The FDA may convene an advisory committee to provide clinical insight on application review questions. Before approving a BLA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with cGCP. If the FDA determines that the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information.

Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

After the FDA evaluates a BLA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A Complete Response letter will describe all of the deficiencies that the FDA has identified in the BLA, except that where the FDA determines that the data supporting the application are inadequate to support approval, the FDA may issue the Complete Response letter without first conducting required inspections, testing submitted product lots and/or reviewing proposed labeling. In issuing the Complete Response letter, the FDA may recommend actions that the applicant might take to place the BLA in condition for approval, including requests for additional information or clarification, completion of other significant and time-consuming requirements related to clinical trials, and/or conduct of additional preclinical studies or manufacturing activities. Even if such data and information are submitted, the FDA may determine that the BLA does not satisfy the criteria for approval. FDA approval of a BLA must be obtained before a biologic may be marketed in the United States. The FDA may delay or refuse approval of a BLA, require additional testing or information and/or require post-marketing testing and surveillance to monitor safety or efficacy of a product.

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the BLA with a Risk Evaluation and Mitigation Strategy, or REMS, to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy to manage a known or potential serious risk associated with a product and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may require one or more Phase 4 post-marketing studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization and may limit further marketing of the product based on the results of these post-marketing studies.

Expedited Programs

A sponsor may seek to develop and obtain approval of its product candidates under programs designed to accelerate the FDA review and approval of marketing applications for new drugs and biologics that meet certain criteria, such as the Fast Track program, priority review, accelerated approval, breakthrough therapy designation and Real-Time Oncology Review, or ROTR, Pilot Program.

Fast Track Designation

The FDA Fast Track program is intended to facilitate development and expedite review of new drugs and biologics that are intended to treat a serious or life-threatening disease or condition and that demonstrate potential to address an unmet medical need. For a Fast Track-designated product, there may be more frequent meetings and communication with the FDA, and early and frequent communication between the FDA and sponsor is encouraged throughout the entire development and review process. The FDA may consider sections of a BLA for review on a rolling basis if certain conditions are satisfied, including an agreement with the FDA on the proposed schedule for submission of portions of the application and the payment of applicable user fees before the FDA may initiate a review. The product may also be eligible for priority review and accelerated approval. 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.

Priority Review

Generally, the FDA follows a two-tiered system of review times, standard review and priority review. For a product that receives priority review designation, the FDA has the goal of taking action on the marketing application within six months of the 60-day filing date, compared to ten months under standard review. However, 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. A priority review designation is applicable for products that, if approved, would be significant improvements in the safety or effectiveness of the

treatment, diagnosis, or prevention of serious conditions when compared to marketed products. The FDA decides on the review designation for every application, however an applicant may expressly request priority review. The FDA informs the applicant of a priority review designation within 60 days of the receipt of the original marketing application. If criteria are not met for priority review, the application is subject to the standard FDA review period of ten months after FDA accepts the application for filing. Priority review designation does not change the scientific or medical standard for approval, or the quality of evidence necessary to support approval.

Accelerated Approval

In addition, the FDA may base accelerated approval for drugs and biologics for serious conditions that fill an unmet medical need on whether the drug or biologic has an effect on a surrogate or an intermediate clinical endpoint. A surrogate endpoint used for accelerated approval is a marker, such as a laboratory measurement, radiographic image, physical sign or other measure that is thought to predict clinical benefit but is not itself a measure of clinical benefit. Likewise, an intermediate clinical endpoint is a measure of a therapeutic effect that is considered reasonably likely to predict the clinical benefit of a product, such as an effect on irreversible morbidity and mortality, or IMM. The FDA bases its decision on whether to accept the proposed surrogate or intermediate clinical endpoint on the scientific support for that endpoint. As a condition of accelerated approval, the FDA will generally require the sponsor to perform adequate and well-controlled post-marketing clinical studies to verify and describe the anticipated effect on IMM or other clinical benefit. Where confirmatory trials verify clinical benefit, FDA will generally terminate the requirement. Approval of a product may be withdrawn or the labeled indication of the product changed, if trials fail to verify clinical benefit or do not demonstrate sufficient clinical benefit to justify the risks associated with the product, for example, if the product shows a significantly smaller magnitude or duration of benefit than was anticipated based on the observed effect on the surrogate endpoint. In addition, the FDA currently requires as a condition for accelerated approval the pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

Breakthrough Therapy Designation

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, such as substantial treatment effects observed early in clinical development. If the FDA designates a breakthrough therapy, it may take actions appropriate to expedite the development and review of the application, which may include holding meetings with the sponsor and the review team throughout the development of the therapy; providing timely advice to, and interactive communication with, the sponsor regarding the development of the drug to ensure that the development program to gather the nonclinical and clinical data necessary for approval is as efficient as practicable; involving senior managers and experienced review staff, as appropriate, in a collaborative, cross-disciplinary review; assigning a cross-disciplinary project lead for the FDA review team to facilitate an efficient review of the development program and to serve as a scientific liaison between the review team and the sponsor; and considering alternative clinical trial designs when scientifically appropriate, which may result in smaller trials or more efficient trials that require less time to complete and may minimize the number of patients exposed to a potentially less efficacious treatment. Breakthrough therapy designation comes with all of the benefits of Fast Track designation, which means that the sponsor may file sections of the BLA for review on a rolling basis if certain conditions are satisfied, including an agreement with the FDA on the proposed schedule for submission of portions of the application and the payment of applicable user fees before the FDA may initiate a review.

Real-Time Oncology Review Pilot Program

The FDA has announced the availability of the RTOR pilot program for oncology product candidates that are likely to demonstrate substantial improvements over available therapy, which may include drugs previously granted breakthrough therapy designation for the same or other indications and candidates meeting other criteria for other expedited programs, such as Fast Track and priority review. Submissions for RTOR consideration should also have straightforward study designs and endpoints that can be easily interpreted (such as overall survival or progression free survival). Acceptance into the RTOR pilot does not guarantee or influence approvability of the application, which is subject to the usual benefit-risk evaluation by FDA reviewers, but the program allows FDA to review data earlier, before an applicant formally submits a complete application. The RTOR pilot program does not affect FDA's PDUFA timelines.

Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or the time period for FDA review or approval may not be shortened. Furthermore, Fast Track designation, priority review, accelerated approval, breakthrough therapy designation and ROTR pilot program do not change the standards for product approval.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States for which there is no reasonable expectation that the cost of developing and making available in the United States a drug or biologic for this type of disease or condition will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. The orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review or approval process.

If a product that has orphan drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusive approval (or exclusivity), which means that the FDA may not approve any other applications, including a full BLA, to market the same biologic for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity by means of greater effectiveness, greater safety or providing a major contribution to patient care or in instances of drug supply issues. Orphan drug exclusivity does not prevent FDA from approving a different drug or biologic for the same disease or condition, or the same drug or biologic for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the BLA application fee.

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

Rare Pediatric Disease Designation and Priority Review Vouchers

Under the Federal Food, Drug and Cosmetic Act, or FDCA, as amended, the FDA incentivizes the development of drugs and biologics that meet the definition of a “rare pediatric disease,” defined to mean a serious or life-threatening disease in which the serious or life-threatening manifestations primarily affect individuals aged from birth to 18 years and the disease affects fewer than 200,000 individuals in the United States or affects more than 200,000 in the United States and for which there is no reasonable expectation that the cost of developing and making in the United States a drug for such disease or condition will be recovered from sales in the United States of such drug. The sponsor of a product candidate for a rare pediatric disease may be eligible for a voucher that can be used to obtain a priority review for a subsequent human drug or biologic application after the date of approval of the rare pediatric disease drug product, referred to as a priority review voucher, or PRV. A sponsor may request rare pediatric disease designation from the FDA prior to the submission of its BLA. A rare pediatric disease designation does not guarantee that a sponsor will receive a PRV upon approval of its BLA. Moreover, a sponsor who chooses not to submit a rare pediatric disease designation request may nonetheless receive a PRV upon approval of their marketing application if they request such a voucher in their original marketing application and meet all of the eligibility criteria. If a PRV is received, it may be sold or transferred an unlimited number of times. Congress has extended the PRV program through September 30, 2024, with the potential for PRVs to be granted through September 30, 2026.

Pediatric Information and Pediatric Exclusivity

Under the Pediatric Research Equity Act, or PREA, certain BLAs and certain supplements 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. The Food and Drug Administration Safety and Innovation Act, or FDASIA, amended the FDCA to require that a sponsor who is planning to submit a marketing application for a drug that includes a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration submit an initial Pediatric Study

Plan, or PSP. 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.

A drug or biologic product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued “Written Request” for such a study.

Post-Approval Requirements

Any products manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing user fee requirements, under which FDA assesses an annual program fee for each product identified in an approved BLA.

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 FDA 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. FDA regulations also impose reporting requirements upon sponsors and their third-party manufacturers. Manufacturers and other entities involved in the manufacture and distribution of approved 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, which impose certain procedural and documentation requirements upon sponsors and their third-party manufacturers. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance and other aspects of regulatory 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. Biologic manufacturers and their subcontractors 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, which impose certain procedural and documentation requirements upon sponsors and their third-party manufacturers. Changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements upon sponsors and their third-party manufacturers. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may also place other conditions on approvals including the requirement for a 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. Product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following initial marketing. The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical studies to assess new safety risks; or

imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

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

The FDA closely regulates the marketing, labeling, advertising and promotion of biologics. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses and misbranding. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective actions, including corrective advertising, and potential civil and criminal penalties, including monetary penalties. Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products, and a company that is found to have improperly promoted off-label uses may be subject to significant liability, including investigation by federal and state authorities. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use or first publication (or thirty days in advance of their first use if approved via the accelerated approval pathway). 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.

Biosimilars and Reference Product Exclusivity

The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively referred to as the ACA, signed into law in 2010, includes a subtitle called the Biologics Price Competition and Innovation Act of 2009, or BPCIA, which created an abbreviated approval pathway for biological products that are shown to be similar to or interchangeable with an FDA-approved reference biological product.

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 biological product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic without such alternation or switch. Complexities associated with the larger, and often more complex, structure of biological products as compared to small molecule drugs, as well as the processes by which such products are manufactured, pose significant hurdles to implementation that are still being worked out by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of

the reference product if the FDA approves a full BLA for the competing product containing that applicant's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products.

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

Other U.S. Healthcare Laws and Compliance Requirements

In the United States, our current and future operations are subject to regulation by various federal, state and local authorities in addition to the FDA, including but not limited to, the Centers for Medicare & Medicaid Services, or CMS, other divisions of the United States Department of Health and Human Services, or HHS, such as the Office of Inspector General, Office for Civil Rights and the Health Resources and Service Administration, the U.S. Department of Justice, or DOJ, and individual U.S. Attorney offices within the DOJ, and state and local governments. For example, our clinical research, sales, marketing and scientific/educational grant programs may have to comply with the anti-fraud and abuse provisions of the Social Security Act, the federal Anti-Kickback Statute, the false claims laws, the privacy and security provisions of the Health Insurance Portability and Accountability Act, or HIPAA, and similar state laws, each as amended, as applicable.

The federal Anti-Kickback Statute prohibits, among other things, any person or entity, from knowingly and willfully offering, paying, soliciting or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for purchasing, leasing, ordering or arranging for the purchase, lease or order of any item or service reimbursable, in whole or in part, under Medicare, Medicaid or other federal healthcare programs. The term remuneration has been interpreted broadly to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between therapeutic product manufacturers on 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 exceptions and safe harbors are drawn narrowly and practices that involve remuneration that may be alleged to be intended to induce prescribing, purchasing or recommending may be subject to scrutiny if they do not qualify for an exception or safe harbor. Failure to meet all of the requirements of a particular applicable statutory exception or regulatory safe harbor does not make the conduct per se illegal under the Anti-Kickback Statute. Instead, the legality of the arrangement will be evaluated on a case-by-case basis based on a cumulative review of all of its facts and circumstances. Our practices may not in all cases meet all of the criteria for protection under a statutory exception or regulatory safe harbor.

Additionally, the intent standard under the Anti-Kickback Statute was amended by the ACA to a stricter standard such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the ACA codified case law that 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 False Claims Act, or FCA.

The federal false claims and civil monetary penalty laws, including the FCA, which imposes significant penalties and can be enforced by private citizens through civil *qui tam* actions, prohibit any person or entity from, among other things, knowingly presenting, or causing to be presented, a false or fraudulent claim for payment to, or approval by, the federal government, including federal healthcare programs, such as Medicare and Medicaid, knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or knowingly making a false statement to improperly avoid, decrease or conceal an obligation to pay money to the federal government. A claim includes "any request or demand" for money or property presented to the U.S. government. For instance, historically, pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Companies also have been prosecuted for causing false claims to be submitted because of the companies' marketing of the product for unapproved, off-label, and thus generally non-reimbursable, uses.

HIPAA created additional federal criminal statutes that prohibit, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud or to obtain, by means of false or fraudulent pretenses, representations or promises, any money or property owned by, or under the control or custody of, any

healthcare benefit program, including private third-party payors, willfully obstructing a criminal investigation of a healthcare offense and knowingly and willfully falsifying, concealing or covering up by trick, scheme or device, a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Like the Anti-Kickback Statute, the ACA amended the intent standard for certain healthcare fraud statutes under HIPAA such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

Also, many states have similar, and typically more prohibitive, fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

We may be subject to data privacy and security regulations by both the federal government and the states in which we conduct our business. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and its implementing regulations, imposes requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's privacy and security standards directly applicable to business associates, independent contractors or agents of covered entities that receive or obtain protected health information in connection with providing a service on behalf of a covered entity. HITECH also created four 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 HIPAA and seek attorneys' fees and costs associated with pursuing federal civil actions. In addition, many state laws govern the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways, are often not pre-empted by HIPAA, and may have a more prohibitive effect than HIPAA, thus complicating compliance efforts.

We may develop products that, once approved, may be administered by a physician. Under currently applicable U.S. law, certain products not usually self-administered (including injectable drugs) may be eligible for coverage under Medicare through Medicare Part B. Medicare Part B is part of original Medicare, the federal health care program that provides health care benefits to the aged and disabled, and covers outpatient services and supplies, including certain pharmaceutical products, that are medically necessary to treat a beneficiary's health condition. As a condition of receiving Medicare Part B reimbursement for a manufacturer's eligible drugs, the manufacturer is required to participate in other government healthcare programs, including the Medicaid Drug Rebate Program and the 340B Drug Pricing Program. The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the Secretary of HHS as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. Under the 340B Drug Pricing Program, the manufacturer must extend discounts to entities that participate in the program.

In addition, many pharmaceutical manufacturers must calculate and report certain price reporting metrics to the government, such as average sales price and best price. Penalties may apply in some cases when such metrics are not submitted accurately and timely. Further, these prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. It is difficult to predict how Medicare coverage and reimbursement policies will be applied to our products in the future and coverage and reimbursement under different federal healthcare programs are not always consistent. Medicare reimbursement rates may also reflect budgetary constraints placed on the Medicare program.

Additionally, the federal Physician Payments Sunshine Act, or the Sunshine Act, within the ACA, and its implementing regulations, require that certain manufacturers of drugs, devices, biological and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) report annually to CMS information related to certain payments or other transfers of value made or distributed to physicians (defined to include defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, or to entities or individuals at the request of, or designated on behalf of, the physicians and teaching hospitals and to report annually certain ownership and investment interests held by physicians and their immediate family members. Beginning in 2022, applicable manufacturers also will be required to report such information regarding its payments and other transfers of value to physician assistants, nurse practitioners, clinical nurse specialists, anesthesiologist assistants, certified registered nurse anesthetists and certified nurse midwives during the previous year. Failure to report accurately could result in penalties.

In addition, many states also govern the reporting of such payments or other transfers of value, many of which differ from each other in significant ways, are often not pre-empted and may have a more prohibitive effect than the Sunshine Act, thus further complicating compliance efforts.

In order to distribute products commercially, we must comply with state laws that require the registration of manufacturers and wholesale distributors of drug and biological products in a state, including, in certain states, manufacturers and distributors who ship products into the state even if such manufacturers or distributors have no place of business within the state. Some states also impose requirements on manufacturers and distributors to establish the pedigree of product in the chain of distribution, including some states that require manufacturers and others to adopt new technology capable of tracking and tracing product as it moves through the distribution chain. Several states have enacted legislation requiring pharmaceutical and biotechnology companies to establish marketing compliance programs, file periodic reports with the state, make periodic public disclosures on sales, marketing, pricing, clinical trials and other activities and/or register their sales representatives, as well as to prohibit pharmacies and other healthcare entities from providing certain physician prescribing data to pharmaceutical and biotechnology companies for use in sales and marketing, and to prohibit certain other sales and marketing practices. All of our activities are potentially subject to federal and state consumer protection and unfair competition laws.

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. Ensuring business arrangements with third parties comply with applicable healthcare laws and regulations is a costly endeavor. If our operations are found to be in violation of any of the federal and state healthcare laws described above or any other current or future governmental regulations that apply to us, we may be subject to penalties, including without limitation, civil, criminal and/or administrative penalties, damages, fines, disgorgement, individual imprisonment, exclusion from participation in government programs, such as Medicare and Medicaid, injunctions, private *qui tam* actions brought by individual whistleblowers in the name of the government, refusal to allow us to enter into government contracts, contractual damages, reputational harm, administrative burdens, diminished profits and future earnings, 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, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

The Foreign Corrupt Practices Act

The Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering or authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with accounting provisions requiring us 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.

Environmental, Health and Safety Regulation

In addition to the foregoing, state and federal laws regarding safe working conditions, environmental protection and hazardous substances, including the Occupational Safety and Health Act, the Resource Conservancy and Recovery Act and the Toxic Substances Control Act, affect our business. These and other laws govern our use, handling and disposal of various biological, chemical and radioactive substances used in, and wastes generated by, our operations. We may incur significant costs to comply with such laws and regulations now or in the future. If our operations result in contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and governmental fines. We believe that we are in material compliance with applicable environmental laws and regulations and that continued compliance therewith will not have a material adverse effect on our business. We cannot predict, however, how changes in these laws and regulations may affect our future operations.

European Union Drug Development

In the European Union, our future products may be subject to extensive regulatory requirements. As in the United States, medicinal products can be marketed only if a marketing authorization from the competent regulatory agencies has been obtained.

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

The EU clinical trials legislation currently is undergoing a transition process mainly aimed at harmonizing and streamlining clinical-trial authorization, simplifying adverse-event reporting procedures, improving the supervision of clinical trials and increasing their transparency. In April 2014, the EU adopted a new Clinical Trials Regulation (EU) No 536/2014, which is set to replace the current Clinical Trials Directive 2001/20/EC. It will overhaul the current system of approvals for clinical trials in the EU. Specifically, the new regulation, which will be directly applicable in all member states, aims at simplifying and streamlining the approval of clinical trials in the EU. For instance, the new Clinical Trials Regulation provides for a streamlined application procedure via a single entry point and strictly defined deadlines for the assessment of clinical trial applications. It is expected that the new Clinical Trials Regulation (EU) No 536/2014 will apply following confirmation of full functionality of the Clinical Trials Information System, the centralized EU portal and database for clinical trials foreseen by the regulation, through an independent audit.

European Union Drug Review and Approval

In the European Economic Area, or EEA, which consists of the 27 Member States of the European Union, as well as Norway, Iceland and Liechtenstein, medicinal products can only be commercialized after obtaining a marketing authorization, or MA. There are two types of marketing authorizations.

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

- National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member States through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure. Under the Decentralized Procedure an identical dossier is submitted to the competent authorities of each of the Member States in which the MA is sought, one of which is selected by the applicant as the Reference Member State, or RMS. The competent authority of the RMS prepares a draft assessment report, a draft summary of the product characteristics, or SPC, and a draft of the labeling and package leaflet, which are sent to the other Member States (referred to as the Concerned Member States) for their approval. If the Concerned Member States 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 the RMS and the Concerned Member States.

A Community MA may be granted only to a Marketing Authorization Holder, or MAH, that is established in the EEA. Regulation (EC) No 1901/2006 provides that prior to obtaining a MA in the EEA, applicants have to demonstrate compliance with all measures included in an EMA-approved Pediatric Investigation Plan, or PIP,

covering all subsets of the pediatric population, unless the EMA has granted (1) a product-specific waiver, (2) a class waiver or (3) a deferral for one or more of the measures included in the PIP.

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.

PRIME Designation in the European Union

In March 2016, the EMA launched an initiative to facilitate development of product candidates in indications, often rare, for which few or no therapies currently exist. The PRIority MEdicines, or PRIME, scheme is intended to encourage drug development in areas of unmet medical need and provides accelerated assessment of products representing substantial innovation reviewed under the centralized procedure. Products from small- and medium-sized enterprises, or SMEs, may qualify for earlier entry into the PRIME scheme than larger companies. Many benefits accrue to sponsors of product candidates with PRIME designation, including but not limited to, early and proactive regulatory dialogue with the EMA, frequent discussions on clinical trial designs and other development program elements and accelerated marketing authorization application assessment once a dossier has been submitted. Importantly, a dedicated Agency contact and rapporteur from the CHMP or CAT are appointed early in the PRIME scheme facilitating increased understanding of the product at EMA's Committee level. A kick-off meeting initiates these relationships and includes a team of multidisciplinary experts at the EMA to provide guidance on the overall development and regulatory strategies.

European Union Drug Marketing

Marketed products in the EU are subject to substantial continuing regulation, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution and advertising and promotion of the product. For example, much like the Anti-Kickback Statute prohibition in the United States, the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is also prohibited in the European Union. The provision of benefits or advantages to physicians is governed by the national anti-bribery laws of European Union Member States, and infringement of these laws could result in substantial fines and imprisonment. Payments made to physicians in certain European Union Member States must also be publicly disclosed, and 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.

EU regulations applicable to marketed products exist at the regional, national and local levels, and regulations applicable at the EU level may be adopted and implemented differently by individual Member States. These regulations, and their differing implementations in Member States, increase our legal and financial compliance costs and may make some activities more time-consuming and expensive.

Before products become available to patients in the EU, they are generally subject to decisions on pricing and reimbursement by the applicable authorities in a Member State. Key criteria to determine the reimbursement status and pricing of a product may include the product's therapeutic value, medical need, safety, and cost effectiveness. Obtaining pricing and reimbursement approval of a product from a government is a time-consuming and costly process, and significant uncertainty exists as to the pricing and reimbursement status of any product candidates for which we may seek marketing approval in the EU. Our ability to commercialize any such products successfully in the EU will depend, in part, on the outcome of these decisions.

European Union New Chemical Entity Exclusivity

In the European Union, new chemical entities, sometimes referred to as new active substances, qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. The data exclusivity, if granted, prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. The overall ten-year period will be extended to a maximum of 11 years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation

prior to their authorization, are determined to bring a significant clinical benefit in comparison with currently approved therapies.

European Union Orphan Designation and Exclusivity

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

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

European Data Collection

The collection and use of personal health data in the EEA is governed by the General Data Protection Regulation ((EU) 2016/679), or GDPR, which became effective May 25, 2018. The GDPR applies to any company established in the EEA and to companies established outside the EEA that process personal data in connection with the offering of goods or services to data subjects in the EU or the monitoring of the behavior of data subjects in the European Union. The GDPR enhances data protection obligations for controllers and processors of personal data, including stringent requirements relating to the consent of data subjects, expanded disclosures about how personal data is used, requirements to conduct privacy impact assessments for high-risk processing, limitations on retention of personal data and mandatory data breach notification and privacy by design requirements, and creates direct obligations on service providers acting as data processors. The GDPR also imposes strict rules on the transfer of personal data outside of the EEA to countries that do not ensure an adequate level of protection, such as the U.S. Failure to comply with the requirements of the GDPR and the related national data protection laws of the EEA Member States may result in fines up to 20 million Euros or 4% of a company's global annual revenues for the preceding financial year, whichever is higher. Moreover, the GDPR grants data subjects the right to claim compensation for damages resulting from infringement of the GDPR. Given the breadth and depth of changes in data protection obligations, maintaining compliance with the GDPR will require significant time, resources and expense, and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects. Further, the United Kingdom's decision to leave the EU, often referred to as Brexit, has created uncertainties with regard to data protection regulation in the United Kingdom.

Rest of the World Regulation

For other countries outside of the European Union and the United States, such as the United Kingdom and 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, clinical trials must be conducted in accordance with cGCP requirements and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki. In light of Brexit, the United Kingdom (with the exception of Northern Ireland) will be considered a third country with respect to the EEA and has separate regulatory requirements. The Medicines and Healthcare products Regulatory Agency, or MHRA, will take on additional regulatory responsibilities for medical products marketed in the UK, as pan-EU regulatory procedures before the EMA will no longer apply in the UK, and biologics will require an additional national marketing authorization in the UK. Failure to comply with applicable foreign laws and regulatory requirements may result in, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, and operating restrictions.

Additional Laws and Regulations Governing International Operations

If we further expand our operations outside of the United States, we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The FCPA prohibits

any U.S. individual or business from paying, offering, authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations. Likewise, the UK Bribery Act of 2010 applies to companies that carry on all or part of their business in the UK, and prohibits bribing another person or being bribed, bribing a foreign public official with the intent to influence and obtain or retain business or an advantage, and failure by a commercial party to prevent bribery, including where the prohibited conduct or its effects occurred entirely outside the UK.

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

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

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

Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we may obtain regulatory approval. In the United States and in foreign markets, sales of any products for which we receive regulatory approval for commercial sale will depend, in part, on the extent to which third-party payors provide coverage and establish adequate reimbursement levels for such products. In the United States, third-party payors include federal and state healthcare programs, private managed care providers, health insurers and other organizations. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid in the United States, and commercial payors are critical to new product acceptance.

Our ability to commercialize any products successfully also will depend, in part, on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which therapeutics they will pay for and establish reimbursement levels. 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 therapeutic 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.

We cannot be sure that reimbursement will be available for any product that we commercialize and, if coverage and reimbursement are available, what the level of reimbursement will be. Coverage may also be more limited than the purposes for which the product is approved by the FDA or comparable foreign regulatory

authorities. Reimbursement may impact the demand for, or the price of, any product for which we obtain regulatory approval.

Third-party payors are increasingly challenging the price, examining the medical necessity and reviewing the cost-effectiveness of medical products, therapies and services, in addition to questioning their safety and efficacy. Obtaining reimbursement for our products may be particularly difficult because of the higher prices often associated with branded drugs and drugs administered under the supervision of a physician. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of our products, in addition to the costs required to obtain FDA approvals. Our product candidates may not be considered medically necessary or cost-effective. 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 product on a payor-by-payor basis, with no assurance that coverage and adequate reimbursement will be obtained. A payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize any product candidate that we successfully develop.

Different pricing and reimbursement schemes exist in other countries. In the EU, governments influence the price of pharmaceutical products through their pricing and reimbursement rules and control of national health care systems that fund a large part of the cost of those products to consumers. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical trials that compare the cost effectiveness of a particular product candidate to currently available therapies. Other member states allow companies to fix their own prices for medicines but monitor and control company profits. The downward pressure on health care costs has become intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country.

The marketability of any product candidates for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, emphasis on managed care, the increasing influence of health maintenance organizations and additional legislative changes in the United States have increased, and we expect will continue to increase, the pressure on healthcare pricing. The downward pressure on the rise in healthcare costs in general, particularly prescription medicines, medical devices and surgical procedures and other treatments, has become very intense. 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.

Healthcare Reform

In the United States and some foreign jurisdictions, there have been, and continue to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect the ability to profitably sell product candidates for which marketing approval is obtained. Among policy makers and payors in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives.

For example, the ACA has substantially changed healthcare financing and delivery by both governmental and private insurers. Among the ACA provisions of importance to the pharmaceutical and biotechnology industries are the following:

- an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in some government healthcare programs;

- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13% of the Average Manufacturer Price, or the AMP, for most branded and generic drugs, respectively, and a cap on the total rebate amount for innovator drugs at 100% of the AMP;

- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts, which through subsequent legislative amendments, were increased to 70% in 2019, off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturers' outpatient drugs to be covered under Medicare Part D;

- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;

- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;

- expansion of the entities eligible for discounts under the 340B Drug Discount Program;

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

- expansion of healthcare fraud and abuse laws, including the FCA and the Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance;

- 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;

- requirements to report certain financial arrangements with physicians and teaching hospitals; and

- establishment of a Center for Medicare and Medicaid Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending.

There have been legal and political challenges to certain aspects of the ACA. For example, former President Trump signed several executive orders and other directives designed to delay, circumvent or loosen certain requirements mandated by the ACA. Additionally, the United States Supreme Court is currently reviewing the constitutionality of the ACA, but it is unclear when a decision will be made. Although the United States Supreme Court has not yet ruled on the constitutionality of the ACA, on January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. It is unclear how the Supreme Court ruling, other such litigation, and the healthcare reform measures of the Biden administration will impact the ACA. The ultimate content, timing or effect of any healthcare reform legislation on the U.S. healthcare industry is also unclear.

We anticipate that the ACA, if substantially maintained in its current form, will continue to result in additional downward pressure on coverage and the price that we receive for any approved product, and could seriously harm our business. Any reduction in reimbursement from Medicare and other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our products. Such reforms could have an adverse effect on anticipated revenue from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop product candidates.

Further legislation or regulation could be passed that could harm our business, financial condition and results of operations. Other legislative changes have been proposed and adopted since the ACA was enacted. Aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect beginning on April 1, 2013, will stay in effect through 2027 unless additional Congressional action is taken.

However, COVID-19 relief support legislation suspended the 2% Medicare sequester from May 1, 2020 through March 31, 2021.

Additionally, there has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several U.S. Congressional inquiries, presidential executive orders and proposed and enacted federal 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. The Trump administration used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. For example, on July 24, 2020 and September 13, 2020, the Trump administration announced several executive orders related to prescription drug pricing that attempt to implement several of the administration's proposals. On November 20, 2020, HHS finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The implementation of the rule has been delayed by the Biden administration from January 1, 2022 to January 1, 2023 in response to ongoing litigation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a new safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which have also been delayed pending review by the Biden administration until March 22, 2021. Further, on November 20, 2020, CMS issued an interim final rule implementing President Trump's Most Favored Nation executive order, which would tie Medicare Part B payments for certain physician-administered drugs to the lowest price paid in other economically advanced countries, effective January 1, 2021. On December 28, 2020, the United States District Court in Northern California issued a nationwide preliminary injunction against implementation of the interim final rule. However, it is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. Individual states in the United States have also become increasingly active in passing legislation and implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. Further, it is possible that additional governmental action is taken in response to COVID-19.

Human Capital

Our team of talented scientists and industry professionals is the foundation of our company and fuels our historical and prospective achievements for patients. We consider the intellectual capital of our employees to be an essential driver of our business and key to our future opportunities. As of December 31, 2020, we had 210 employees, of which approximately 165 (79%) are engaged in research and development activities, 86 hold Ph.D. and/or M.D. degrees and an additional 50 hold a masters or other post-graduate degree. Every NGM team member plays a vital role in furthering our goals and impacting our progress towards fully realizing our mission to develop transformative therapies for patients.

To succeed in our mission, we must attract, recruit, retain, develop and motivate qualified clinical, nonclinical, scientific, manufacturing, regulatory, management and other personnel needed to support our business and operations. Based in the San Francisco Bay Area, we face significant competition for experienced employees from a large and diverse group of biotechnology and pharmaceutical companies. As a result of intense recruitment efforts within biotech, we face higher turnover rates than other industries. In 2020, particularly after the COVID-19 pandemic necessitated remote work for most employees, we experienced a higher-than-normal rate of employees leaving the company to pursue other opportunities. This turnover was mitigated by a robust recruiting effort, with 70 new employees hired last year. We maintain a comprehensive set of metrics, including recruitment yield, employee engagement, total rewards benchmarking, turnover and exit interviews, to guide our human capital management efforts.

We believe that we can best address competitive challenges by enhancing the reputation of NGM as a great place to work, which includes nurturing our workplace culture, providing competitive compensation and benefits programs and supporting employee career development. To that end, we continue to invest resources and energy into being an employer of choice – attracting and engaging individuals who are innovative, curious, driven, diligent, collaborative and of the highest scientific integrity and ethics. Some of our key efforts in this area and management of our human capital assets generally are described here.

Compensation and Benefits

Our compensation philosophy is to provide pay and benefits that are competitive in the biotechnology and pharmaceutical industry where we compete for talent. We monitor our compensation programs closely and review them at least annually to provide what we consider to be a very competitive mix of compensation and health, welfare and retirement benefits for all our employees. Our compensation package for all employees includes market-competitive base salaries, annual performance bonuses and stock option grants. Our benefits programs include company sponsored medical, dental and vision health care coverage, life and AD&D insurance, a 401(k) plan with a matching employer contribution, paid time off and family leave and an employee stock purchase plan, among others benefits. At the end of 2020, we undertook a detailed review of our compensation by position and level and made adjustments necessary to ensure that we continue to provide competitive compensation. We are focused on fairness in pay equity across gender and ethnicity among similar roles and responsibilities throughout our organization, after accounting for legitimate business factors that can explain differences, such as performance, time at grade level, education and tenure. Our efforts extend beyond pay equity to include fairness in gender and ethnic representation at all levels in the organization.

Diversity, Equity and Inclusion

Our goal is a diverse and inclusive workforce – not just because it is the right thing to do but because we believe that such a workforce is key to our long-term success. As of December 31, 2020, NGM employed 101 women (48%) and 109 men (52%), and 61% of our employees self-identify as non-white, including 10% that are from traditionally underrepresented groups. Our leadership, including employees at or above the vice president level and members of our board of directors, includes 36% women and 32% who self-identify as non-white. To champion our efforts in this area, we formed a cross functional team of employees to drive our diversity, equity and inclusion initiatives that are organized around five pillars: training and education; communication and awareness; diverse candidate pipelines; community outreach; and career advancement and advocacy. In 2020 and into 2021, we have focused on anti-black racism. Our recent efforts have included mandatory unconscious bias and discrimination training, an employee-led diversity page on our intranet, voluntary participation in a program to encourage allyship through twice-weekly exercises in conjunction with Black History Month, conducting a survey to understand employee sentiment around race-related issues to establish a baseline for tracking future progress, planning a pilot 2021 internship program and specific efforts to provide the company with a more diverse candidate pipeline. In addition to internal efforts, NGM continues its practice of quantifying racial, ethnic and gender diversity within completed clinical studies, and in 2021 intends to begin publishing those metrics internally and educating ourselves on industry best-practices to improve recruitment and retention of women and minorities in our clinical trials.

Communication and Engagement

We believe that part of what sets NGM apart from other companies is our culture and, in particular, our focus on providing timely and transparent communications and creating a strong sense of belonging and inclusiveness. The COVID-19 pandemic made it unsafe for us to provide the many traditions and celebrations that contribute to what makes NGM a special place to work: monthly themed happy hours; weekly group lunch programs, often with scientific updates of interest; and events including an annual anniversary party, Thanksgiving potluck and holiday white elephant party, among many others. In 2020, we shifted to a virtual setting and continued to emphasize communication and employee engagement through quarterly all-employee virtual town halls; weekly emails from the CEO; reflection emails from a different employee each week; regular, virtual coffee chats for small groups with our CEO and other members of senior management; our annual employee engagement survey; and company-wide virtual celebrations.

Health, Wellness and Safety

We are committed to the health and safety of our employees. Early in 2020, we formed the CARE, or COVID Awareness and Re-Entry, team to handle issues related to the ongoing COVID-19 pandemic. In addition to advising the company on matters related to compliance with federal, state and local guidance, the CARE team engages in ongoing, frequent communications with employees on matters related to personal safety – particularly for those essential workers required to work on site. We also partner with a third-party provider to provide daily symptom screenings, backed by the support of medical professionals, when warranted. Ongoing activities that continue to promote employee wellness include external support from our employee assistance program as well as recently added mental wellness and health advocacy services. We look forward to resuming all-employee access to our on-site gym, boot camp and other exercise-related options when conditions permit.

None of our employees is subject to a collective bargaining agreement or represented by a trade or labor union. We consider our relations with our employees to be good.

Corporate and Available Information

We were incorporated in Delaware in December 2007 and commenced operations in 2008. Our principal executive offices are located at 333 Oyster Point Blvd., South San Francisco, CA 94080-7014, and our telephone number is (650) 243-5555. Our website address is http://www.ngmbio.com.

We file or furnish electronically with the U.S. Securities and Exchange Commission, or the SEC, annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. We make copies of these reports available free of charge through the “SEC Filings” tab on the “Investors & Media” page of our website as soon as reasonably practicable after we file or furnish them with the SEC.

Information contained on or accessible through our websites is not incorporated into, and does not form a part of, this Annual Report or any other report or document we file with the SEC, and any references to our websites are intended to be inactive textual references only.

Item 1A. Risk Factors.

An investment in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below before deciding whether to make an investment decision with respect to our common stock. You should also refer to the other information contained in this Annual Report on Form 10-K, including "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and related notes. Our business, financial condition, results of operations and prospects could be materially and adversely affected by any of these risks or uncertainties. In any such case, the trading price of our common stock could decline, and you could lose all or part of your investment. We caution you that the risks, uncertainties and other factors referred to below and elsewhere in this Annual Report on Form 10-K may not contain all of the risks, uncertainties and other factors that may affect our future results and operations. Moreover, new risks will emerge from time to time. It is not possible for our management to predict all risks.

Risks Related to Our Financial Condition and Capital Needs

We have incurred net losses every year since our inception and have no source of product revenue. We expect to continue to incur significant and increasing operating losses and may never become profitable.

We have no products approved for commercial sale and have not generated any revenue from product sales to date, and we expect to 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 year since commencing operations. Our net losses were $102.5 million, $42.8 million and $0.5 million for the years ended December 31, 2020, 2019 and 2018, respectively. As of December 31, 2020, we had an accumulated deficit of $298.6 million.

We have spent, and expect to continue to spend, significant resources to fund research and development of, and seek regulatory approvals for, our product candidates. We expect to incur substantial and increasing operating losses over the next several years as our research, development, manufacturing, preclinical studies, clinical trial and related activities increase. We also expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following the end of the current two-year extension of the research phase of our collaboration with Merck through March 16, 2022, regardless of whether we are able to reach agreement with Merck on the terms of a modified collaboration. As a result, our expenses and accumulated deficit will also increase significantly in future periods. We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business, including those resulting from the evolving effects of the COVID-19 pandemic. The size of our future net losses will depend, in part, on the rate of future growth of our expenses, whether Merck will exercise its option to extend the research phase of our collaboration or whether and on what terms we will reach agreement with Merck on a modified collaboration and our ability to otherwise continue to generate revenue, if at all, under the Merck collaboration, and to generate any revenue outside of the Merck collaboration. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

In addition, we will not be able to generate product revenue unless and until one of our product candidates successfully completes clinical trials, receives regulatory approval and is successfully commercialized. As our product candidates are in Phase 2 trials or in earlier stages of development, we do not expect to receive product revenue from our product candidates for a number of years, if ever. Our ability to generate future product revenue from our current or future product candidates also depends on a number of additional factors, including our or our current collaborator's and potential future collaborators' ability to:

- successfully complete research and clinical development of current and future product candidates;
- establish and maintain supply and manufacturing relationships with third parties, and ensure adequate, scaled up and legally compliant manufacturing of bulk drug substances and drug products to maintain sufficient supply;
- launch and commercialize any product candidates for which we obtain marketing approval, if any, and, if launched independently by us without a collaborator, successfully establish a sales force and marketing and distribution infrastructure;

- demonstrate the necessary safety data (and, if accelerated approval is obtained, verify the clinical benefit) post-approval to ensure continued regulatory approval;
- obtain coverage and adequate product reimbursement from third-party payors, including government payors, for any approved products;
- achieve market acceptance for any approved products;
- establish, maintain, protect and enforce our intellectual property rights; and
- attract, hire and retain qualified personnel.

Because of the numerous risks and uncertainties associated with pharmaceutical product development, including that our product candidates may not advance through development or be approved for commercial sale, we are unable to predict if or when we will generate product revenue or achieve or maintain profitability. Even if we successfully complete development and regulatory processes, we anticipate incurring significant costs associated with launching and commercializing any products. If we fail to become profitable or do not sustain profitability on a continuing basis, we may be unable to continue our operations at planned levels and be forced to reduce or cease our operations.

All of our revenue for recent periods has been received from a single collaboration partner.

In recent years, all of our revenue has been from our collaboration partner, Merck. Other than our agreement with Merck, we currently have no agreements that could provide us with material, ongoing future revenue and we may never enter into any agreements. Under our Collaboration Agreement, Merck agreed to reimburse us for research and development activities up to certain specified funding caps during the current two-year extension of the research phase through March 16, 2022. If our research and development expenses for product candidates subject to the Merck collaboration exceed the funding caps provided in our Collaboration Agreement, which happened in the fiscal year ended December 31, 2020 and could happen in the future, we will be required to devote our own financial resources toward the development of such product candidates or, if we are unwilling or unable to do so, pause or suspend such development to remain within the funding caps. In addition, while we cannot predict whether or when Merck will elect to extend the research phase of the collaboration through March 16, 2024 or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the current research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms. Accordingly, we will require significant additional capital in order to proceed with development and commercialization of our current and potential future product candidates, including any product candidate that had been subject to the Merck collaboration but Merck decides not to proceed with under the terms of a modified collaboration or after the end of the research phase, or we will need to enter into additional collaboration or license agreements in order to fund such development and commercialization. Neither may be possible and as a result, we may be required to delay, scale back or discontinue development of such product candidates. For more information, see “Risks Related to Our Dependence on Merck and Other Third Parties” below.

We will require substantial additional capital to finance our operations, which may not be available to us on acceptable terms, or at all. As a result, we may not have the resources to complete the development and commercialization of our current and potential future product candidates.

As a research and development company, our operations have consumed substantial amounts of cash since inception and we will require substantial additional capital to finance our operations and pursue our strategy. In this regard, we do not have any committed external source of funds, other than pursuant to the current terms of

our collaboration with Merck, which is limited in scope and duration, and may be unilaterally terminated by Merck under certain circumstances. In addition, as described in more detail under “Risks Related to Our Dependence on Merck and Other Third Parties” below, the level of future annual research support or other funding from Merck following the end of the current research phase is uncertain, and even if Merck elects to extend the current research phase, such annual research support from Merck is expected to be meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase through March 16, 2022. We also expect our research and development expenses to increase substantially in connection with our ongoing activities regardless of whether we are able to reach agreement with Merck on the terms of a modified collaboration, particularly to the extent that product candidates whose costs will not be included in a modified Merck collaboration, such as aldafermin and other product candidates Merck decides not to proceed with under the terms of a modified collaboration or after the end of the research phase, advance in clinical development. In addition, we may be required to develop and implement additional clinical study policies and procedures to mitigate the evolving effects of the COVID-19 pandemic, which could significantly increase our research and development expenses.

We believe that our existing cash, cash equivalents and short-term marketable securities will be sufficient to fund our operations for at least the next twelve months. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. In addition, our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially as a result of a number of factors, including the factors discussed elsewhere in this “Risk Factors” section. Our future funding requirements, both short- and long-term, will depend on many factors, including:

- the initiation, progress, timing, delays, costs and results of preclinical studies and clinical trials for our current and future product candidates;
- whether and on what terms Merck exercises, if at all, its remaining option to extend the research phase of the collaboration, including whether such exercise would trigger an extension payment to us under the terms of a modified collaboration;
- whether and on what terms we and Merck agree to a modified collaboration, including the level of annual research support from Merck, if any, under a modified collaboration and, relatedly, the scope and extent of our funding obligations with respect to the development of our current and potential future product candidates, including with respect to any such product candidates whose costs will not be included in a modified Merck collaboration such as aldafermin and other product candidates Merck decides not to proceed with under the terms of a modified collaboration or after the end of the research phase;
- whether Merck exercises its option to license product candidates upon completion of proof-of-concept studies for each such candidate in humans;
- whether Merck terminates the research phase of the collaboration under pre-specified circumstances set forth in the Collaboration Agreement or terminates a program that it has licensed (such as Merck’s termination of its license for NGM395 and NGM386);
- whether we exceed the funding caps provided in the Collaboration Agreement;
- the outcome, timing and cost of seeking and obtaining regulatory approvals from the FDA and comparable foreign regulatory authorities, including the potential for such authorities to require that we perform more studies than those that we currently expect or to change their requirements on studies that had previously been agreed to;
- the cost to establish, maintain, expand, enforce and defend the scope of our intellectual property portfolio, including the amount and timing of any payments we may be required to make, or that we may receive, in connection with licensing, preparing, filing, prosecuting, defending and enforcing any patents or other intellectual property rights;
- the effect of products that may compete with our product candidates or other market developments;

- market acceptance of any approved product candidates, including product pricing and product reimbursement by third-party payors;
- the cost of acquiring, licensing or investing in additional businesses, products, product candidates and technologies;
- the cost and timing of selecting, auditing and potentially validating a manufacturing site for commercial-scale manufacturing;
- the cost of establishing sales, marketing and distribution capabilities for our product candidates for which we may receive regulatory approval and that we determine to commercialize ourselves or in collaboration with partners; and
- the extent to which any of the foregoing costs are the responsibility of Merck.

We plan to finance our future cash needs through public or private equity or debt offerings, including under the Open Market Sale Agreement℠, or the Sales Agreement, we entered into with Jefferies LLC in June 2020, government or other third-party funding, product collaborations, strategic alliances, licensing arrangements or a combination of these. Additional capital may not be available in sufficient amounts, on reasonable terms or when we need it, if at all, and our ability to raise additional capital may be adversely impacted by worsening global economic conditions and the disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from, among other things, the evolving effects of the COVID-19 pandemic. If we are unable to raise adequate additional capital, we may be prevented from pursuing development and commercialization efforts, which will have a material adverse effect on our business, operating results and prospects.

Raising additional capital may cause dilution to our existing stockholders, lead to restrictions on our operations or require us to relinquish rights to our product candidates or intellectual property.

If we raise additional funds by issuing equity securities, as we did most recently in January 2021, our stockholders may experience dilution. Debt financing, if available, may involve restrictive covenants. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders. Furthermore, any securities that we may issue may have rights senior to those of our common stock and could contain covenants or protective rights that would lead to restrictions on our operations and potentially impair our competitiveness, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. If adequate funds are not available when we need them, we may need to:

- significantly delay, scale back or discontinue research and discovery efforts and the development or commercialization of any product candidates, or cease all operations;
- seek strategic alliances for research and development programs when we otherwise would not, at an earlier stage than we would otherwise desire or on terms less favorable than might otherwise be available; or
- enter into product collaborations that would generally require us to relinquish, or license on potentially unfavorable terms, our rights to intellectual property, product candidates or products that we otherwise would seek to develop or commercialize ourselves, and we may not be able to enter into such agreements on acceptable terms, if at all.

Our ability to use net operating loss carryforwards to offset taxable income could be limited.

We plan to use our current year operating losses to offset taxable income from any revenue generated from operations, including corporate collaborations. To the extent that our taxable income exceeds any current year operating losses, we plan to use our net operating loss carryforwards to offset income that would otherwise be taxable. Our net operating loss carryforwards generated in tax years ending on or prior to December 31, 2017 are only permitted to be carried forward for 20 years under applicable U.S. tax law. Under the Tax Cuts and JOBS Act, or the 2017 Tax Act, as modified by the Coronavirus Aid, Relief and Economic Security Act, or the CARES Act, our federal net operating losses generated in tax years beginning after December 31, 2017 may be carried forward indefinitely, but the deductibility of such federal net operating losses generated in tax years beginning

after December 31, 2020, is limited to 80% of taxable income. It is uncertain if and to what extent various states will conform to the 2017 Tax Act or the CARES Act.

In addition, under Section 382 of the U.S. Internal Revenue Code of 1986, as amended, or the Code, and corresponding provisions of state law, if we experience an "ownership change," generally defined as a greater than 50% change, by value, in equity ownership over a three-year period, our ability to use our pre-change net operating loss carryforwards to offset our post-change income may be limited. Due to our initial public offering and other shifts in our stock ownership, we have experienced ownership changes in the past and may experience ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which are outside our control. As a result, our use of federal net operating loss carryforwards could be limited. State net operating loss carryforwards may be similarly limited. In addition, at the state level, there may be periods during which the use of net operating losses is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed. For example, California recently imposed limits on the usability of California net operating loss carryforwards and certain tax credits to offset California taxable income or California tax liabilities in tax years beginning after 2019 and before 2023. Any such limitations may result in greater tax liabilities than we would incur in the absence of such limitations and any increased liabilities could adversely affect our business, results of operations, financial position and cash flows.

Risks Related to Our Dependence on Merck and Other Third Parties

We depend on our collaboration with Merck and may depend in the future on collaborations with additional third parties for the development and commercialization of our product candidates. If those collaborations are not successful, we may not be able to capitalize on the market potential of our product candidates.

The Merck collaboration involves a complex allocation of rights, provides for substantial research and development support, currently provides for additional payments upon Merck's election, if exercised in its unilateral discretion, to further extend the term of the research phase for an additional two years and provides us with either milestone payments based on the achievement of specified clinical development, regulatory and commercial milestones and royalty-based revenue if certain product candidates are successfully commercialized or a cost and profit sharing arrangement with the possibility that we would provide sales representatives to co-detail the product candidates that Merck elects to advance in the United States. We cannot predict the success of the collaboration, whether or when Merck will elect to extend the research phase of the collaboration or on what terms, whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, whether Merck will exercise its option to license additional product candidates or whether Merck will terminate its license to a licensed program. In addition, see the risk factor titled "*Merck may elect not to extend the research phase of our collaboration and we may otherwise be unable to reach agreement with Merck on the terms of a modified collaboration and regardless of whether we and Merck reach agreement on the terms of a modified collaboration, our collaboration with Merck involves numerous risks, any of which could materially and adversely affect our business and financial condition*" below.

We may seek other third-party collaborators for the development and commercialization of any product candidates that are not subject to the Merck collaboration, including aldafermin, NGM395 and NGM386 or any other product candidate that Merck decides not to proceed with under the terms of a modified collaboration or after the end of the research phase. If we enter into any such arrangements with any third parties, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates. Our ability to generate revenue from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates, including our collaboration with Merck, pose risks to us, including the following:

- Collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations. For example, under the current terms of our collaboration with Merck, once proof-of-concept data in humans has been generated and Merck has exercised its option to acquire an exclusive license for a product candidate, our ability to influence the

resources Merck devotes to such product candidate are substantially reduced until such time, if any, that we exercise our right to participate in a cost and profit-sharing arrangement. Even after we exercise that right to participate in a cost and profit-sharing arrangement, our ability to influence Merck will be limited.

- Collaborators might opt not to pursue development and commercialization of our product candidates or not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors, such as an acquisition that diverts resources or creates competing priorities. For example, we and Merck are negotiating in good faith certain modifications to the terms of our collaboration, that may include, among other things, focusing NGM's research and development under the collaboration on therapeutic areas of particular interest to Merck, and we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase, In addition, under the current terms of the Collaboration Agreement, it is possible for Merck to unilaterally terminate the MK-3655 program and any other program (whether or not we have exercised our cost and profit sharing option) upon prior written notice, such as it did for NGM386 and NGM395, without triggering a termination of the remainder of the Collaboration Agreement. Moreover, regardless of our current negotiations with Merck and the terms of any modified Collaboration Agreement, Merck may elect not to exercise its option to extend the research phase, and Merck might also opt not to designate any of our product candidates for further development during the tail period following the end of the research phase or exercise any of its options to acquire a license to a product candidate that has generated proof-of-concept data.

- Collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing.

- Collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our medicines or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours.

- A collaborator with marketing and distribution rights might not commit sufficient resources to the marketing and distribution of our product candidates.

- Collaborators might 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 proprietary information or expose us to potential litigation.

- Disputes may arise between the collaborators and us that result in the delay or termination of the research, development or commercialization of our medicines or product candidates or that result in costly litigation or arbitration that diverts management attention and resources.

- We may lose certain valuable rights under circumstances identified in our collaborations, including, in the case of our collaboration with Merck, if we undergo a change in control.

- Collaborations might be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.

- Collaboration agreements might not lead to development or commercialization of product candidates in the most efficient manner, or at all. If a present or future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program under such collaboration could be delayed, diminished or terminated.

Merck may elect not to extend the research phase of our collaboration and we may otherwise be unable to reach agreement with Merck on the terms of a modified collaboration and regardless of whether we and

Merck reach agreement on the terms of a modified collaboration, our collaboration with Merck involves numerous risks, any of which could materially and adversely affect our business and financial condition.

Under the terms of the collaboration, Merck was required to notify us no later than March 17, 2021 of its unilateral decision whether to exercise its option to extend the research phase of the collaboration for an additional two-year term through March 16, 2024. In March 2021, Merck initiated discussions with us with respect to elements of the ongoing collaboration that might be optimized to better address the evolving interests and priorities of both NGM and Merck during the remainder of the current research phase through March 16, 2022 and during any extension of the current research phase and any tail period (which tail period is discussed under "Business—Our Collaboration with Merck" in Part I, Item 1A of this Annual Report on Form 10-K). In this regard, the parties are negotiating in good faith certain modifications to the terms of the collaboration. Such modifications may include, among other things, focusing NGM's research and development under the collaboration on therapeutic areas of particular interest to Merck, while enabling NGM to conduct research and development outside of these therapeutic areas, which would, if mutually agreed to, allow NGM to discover and develop product candidates on its own or with third parties in other areas of interest. In order to allow negotiations to proceed, the parties have agreed to extend the March 17, 2021 deadline for Merck to deliver its extension notification decision until June 30, 2021. While we cannot predict whether or when Merck will elect to extend the research phase of the collaboration or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the current research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms and we cannot otherwise assure you that Merck will elect to extend the research phase or that we will reach agreement with Merck on modified terms.

In addition, the level of future research funding from Merck following the end of the current research phase is uncertain. For example, if Merck does not elect to extend the research phase, we expect that Merck would decide not to designate certain of our product candidates for development during the tail period and it is possible that Merck could decide not to designate any of our product candidates for development during the tail period, in which case research funding from Merck would be substantially reduced or eliminated following the end of the current research phase. In addition, Merck is not required to designate any of our product candidates for development during the tail period until the three-month period prior to the end of the research phase, which could delay or preclude our ability to move forward with the development of certain of our product candidates, and could otherwise result in uncertainty regarding the future prospects of certain of our product candidates. Moreover, our stock price could decline as a result of such uncertainty and/or Merck's failure to designate certain of our product candidates for development during the tail period. Even if Merck elects to designate certain product candidates for development during the tail period, there are limits on Merck's funding obligations and Merck has the ability to terminate the tail period early. In addition, in the event that Merck decides to take over any designated product candidates for development during the tail period, we could be subject to disputes with Merck with respect to their obligation to use commercially reasonable efforts with respect to such development, which could delay or preclude the further development of the affected product candidate, and we could otherwise be subject to disputes with Merck over the scope of the parties' respective rights under the Collaboration Agreement.

In addition, under the Collaboration Agreement, Merck has the unilateral right to terminate all or part of the agreement at certain times and under certain circumstances. Merck also may unilaterally terminate its annual funding of the research program prior to the end of the research phase if we are acquired by a third party or if we are in material uncured breach of our obligations under the research and early development program. After the current research phase of the collaboration or, if Merck again exercises its option to extend the research phase under modified collaboration terms, after such extension period, Merck may unilaterally terminate the overall agreement for convenience upon written notice and subject to certain limitations.

Subject to certain limitations, Merck may partially terminate the Collaboration Agreement for convenience as it relates to MK-3655 or any future licensed program. For example, Merck terminated its license to our GDF15 receptor agonist program, including NGM395 and NGM386, in May 2019. Merck may also unilaterally terminate the agreement as it relates to its rights to research and develop small molecule compounds. It may also unilaterally terminate the agreement with respect to a specific licensed program in the event of an uncured material breach by us. If Merck terminates a program as a result of our uncured material breach, then we would lose our option to participate in global cost and profit sharing if not yet exercised as of the time of termination and lose our co-detailing option (whether or not exercised as of that time) for the relevant licensed program.

If Merck terminates funding or terminates the Collaboration Agreement, if we are unable to reach agreement with Merck on the terms of a modified collaboration and Merck decides not to extend the research phase of the collaboration or shifts the focus of its research and development funding or if Merck declines to designate our product candidates for development during the tail period, it would delay or preclude our ability to complete our research and development programs, which would materially and adversely affect our business and our stock price would likely decline.

We may not be able to obtain and maintain the relationships with third parties that are necessary to develop, commercialize and manufacture some or all of our product candidates.

In addition to our dependence on our collaboration with Merck, we expect to depend on other collaborators, partners, licensees, CROs, clinical data management organizations, clinical investigators, CMOs and other third parties to support our discovery efforts, to formulate product candidates, to conduct our clinical trials and certain aspects of our research and preclinical studies, to manufacture clinical and commercial scale quantities of our drug substances and drug products and to market, sell and distribute any products we successfully develop and for which we obtain regulatory approval. Any problems we experience with any of these third parties could delay our research efforts or the development, commercialization and manufacturing of our products or product candidates, which could harm our results of operations.

We cannot guarantee that we or, as applicable, our collaborator will be able to successfully negotiate agreements for, or maintain relationships with, collaborators, partners, licensees, CROs, clinical data management organizations, clinical investigators, CMOs and other third parties on favorable terms, if at all. If we or our collaborator are unable to obtain or maintain these agreements, we may not be able to clinically develop, formulate, manufacture, obtain regulatory approvals for or commercialize our product candidates, which will, in turn, adversely affect our business. If we or our collaborator need to enter into alternative arrangements, it would delay our product development activities and such alternative arrangements may not be available on terms acceptable to us.

We expect to continue to expend substantial management time and effort to enter into relationships with third parties and, if we successfully enter into such relationships, to manage these relationships. In addition, our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For example, we will remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. However, we cannot control the amount or timing of resources our contract partners will devote to our research and development programs, product candidates or potential product candidates, and we cannot guarantee that these parties will fulfill their obligations to us under these arrangements in a timely fashion, if at all. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our medicines. In addition, we base our expense accruals related to clinical trials on our estimates of the services received and efforts expended pursuant to contracts with multiple research institutions and CROs that conduct and manage clinical trials on our behalf and, if their estimates are not accurate, it could negatively affect the accuracy of our financial statements.

Any agreements we have or may enter into with these third parties may give rise to disputes regarding the rights and obligations of the parties. Disagreements could develop over contract interpretation, rights to ownership or use of intellectual property, the scope and direction of research and development, the approach for regulatory approvals or commercialization strategy. We are conducting research programs in a range of therapeutic areas, and our pursuit of these opportunities could result in conflicts with the other parties to these agreements that may be developing or selling pharmaceuticals or conducting other activities in these same

therapeutic areas. Any disputes or commercial conflicts could lead to the termination of our agreements, delay progress of our product development programs, compromise our ability to renew agreements or obtain future agreements, lead to the loss of intellectual property rights, result in increased financial obligations for us or result in costly litigation.

In addition, we are less knowledgeable about the reputation and quality of third-party contractors in countries outside of the United States where we conduct discovery research or preclinical and clinical development and manufacturing of our product candidates and, therefore, we may not choose the best parties for these relationships.

We may seek to establish additional collaborations, and, if we are not able to establish them on commercially reasonable terms, we may have to alter our development and commercialization plans.

Our drug development programs and the potential commercialization of our product candidates will require substantial additional cash to fund expenses. For product candidates not partnered with Merck, such as aldafermin, NGM395 and NGM386 or any other product candidate that Merck decides not to proceed with under the terms of a modified collaboration or after the end of the research phase, we may decide to collaborate with other pharmaceutical and biotechnology companies for their development and potential commercialization. We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors, including the potential market for the subject product candidate.

We also may be restricted under existing collaboration agreements from entering into future agreements on certain terms with potential collaborators. For example, under the current terms of our Collaboration Agreement with Merck, we may not directly or indirectly research, develop, manufacture or commercialize, except pursuant to the Collaboration Agreement, any medicine or product candidate that modulates a target then subject to the collaboration with specified activity. The FGF19 program, including aldafermin, is excluded from this provision, notwithstanding that both aldafermin and MK-3655 signal, in part, through the FGFR1c pathway. During the tail period following the research term of the collaboration, we may not directly or indirectly research, develop or commercialize, outside of the collaboration, any medicine or product candidate with specified activity against any collaboration target that has been designated a tail target.

We may not be able to negotiate potential future collaborations on a timely basis, on acceptable terms or at all. If we are unable to do so, we may have to delay, scale back or discontinue the development of any product candidate for which we are seeking a collaboration, 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.

Risks Related to Our Business and Industry

Our product candidates must undergo rigorous clinical trials before seeking regulatory approvals, which could delay or prevent commercialization of our product candidates.

All of our product candidates will be subject to rigorous and extensive clinical trials before we can seek regulatory approval from the FDA and comparable foreign regulatory authorities. Clinical trials may be delayed, suspended or terminated at any time for reasons including:

- ongoing discussions with the FDA or comparable foreign authorities regarding the scope or design of our clinical trials, including discussions with the FDA regarding initiation of our planned Phase 3 trial of aldafermin;
- delays in obtaining, or the inability to obtain, required approvals from institutional review boards, or IRBs, or other governing entities at clinical trial sites selected for participation in our clinical trials;
- delays in key trial activities and patient enrollment, including as a result of the evolving effects of the COVID-19 pandemic;

- delays in reaching agreement on acceptable terms with prospective CROs;
- deviations from the trial protocol by clinical trial sites and investigators, or failures to conduct the trial in accordance with regulatory requirements;
- lower than anticipated retention rates of participants in clinical trials, including patients dropping out due to side effects, disease progression or concerns about the COVID-19 pandemic;
- delays in patients completing a trial or returning for post-treatment follow-up;
- failure of third parties, such as CROs, to satisfy their contractual duties to us or meet expected deadlines;
- for clinical trials in selected patient populations, delays in identification and auditing of central or other laboratories and the transfer and validation of assays or tests to be used to identify selected patients and test any patient samples;
- implementation of new, or changes to, guidance or interpretations from the FDA or comparable foreign authorities with respect to approval pathways for product candidates we are pursuing;
- the need to repeat clinical trials as a result of inconclusive or negative results, poorly executed testing or changes in required endpoints;
- insufficient supply or deficient quality of drug substance, drug product or other clinical trial material necessary to conduct our clinical trials, as well as delays in the testing, validation, manufacturing and delivery to clinical trial sites of such material;
- withdrawal of clinical trial sites or investigators from our clinical trials for any reason, including as a result of changing standards of care or the ineligibility of a site to participate in our clinical trials;
- unfavorable FDA or comparable foreign authority inspection or review of a clinical trial site or records of any clinical or preclinical investigation;
- drug-related adverse effects or tolerability issues experienced by participants in our clinical trials;
- changes in government regulations or administrative actions or lack of adequate funding to continue the clinical trials;
- our ability to hire and retain key R&D personnel; or
- the placement of a clinical hold on a trial by the FDA or comparable foreign authorities.

In particular, we or our partners may be unable to enroll the patients we need to complete clinical trials on a timely basis, or at all. For example, there is significant competition for recruiting patients with NASH in clinical trials. In the first quarter of 2020, we announced that enrollment in our ALPINE 2/3 clinical trial of aldafermin had been delayed beyond our initial projections. In addition, clinical trial enrollment generally continues to be negatively affected by the effects of the COVID-19 pandemic, including in our ongoing ALPINE 4, CATALINA and NGM120 trials, as a result of delays in additional clinical trial site initiation, suspension of enrollment at clinical trial sites or patient reluctance to participate in a clinical trial during quarantines or shelter-in-place orders or otherwise, particularly in medically vulnerable patient populations. If the evolving effects of the COVID-19 pandemic persist or become more severe, we could experience significant disruptions to our clinical development timelines, which would adversely affect our business, financial condition, results of operations and growth prospects.

We cannot guarantee that we will be able to successfully accomplish required regulatory and/or manufacturing activities or all of the other activities necessary to initiate and complete clinical trials. As a result, our preclinical studies and clinical trials may be extended, delayed or terminated, and we may be unable to obtain regulatory approvals or successfully commercialize our products. We also have only limited experience in conducting late-stage clinical trials required to obtain regulatory approval. In any event, 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.

Our product development costs will increase if we continue to experience delays in clinical testing. Significant clinical trial delays could also shorten any periods during which we may have the exclusive right to

commercialize our product candidates or allow our competitors to bring products to market before we do, which would impair our ability to successfully commercialize our product candidates and may harm our business, results of operations and prospects. Our or our collaborators' inability to timely complete clinical development could result in additional costs to us or impair our ability to generate product revenue or development, regulatory, commercialization and sales milestone payments and royalties on product sales.

If clinical trials of our product candidates fail to product positive results or to demonstrate safety and efficacy to the satisfaction of regulatory authorities, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.

Our product candidates are in various stages of development and our most advanced product candidate, aldafermin, is still only in Phase 2 development. Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we or our collaborators must conduct extensive preclinical studies and clinical trials to demonstrate the safety and efficacy of the product candidates in humans. Preclinical studies and clinical trials are expensive, take several years to complete and may not yield results that support further clinical development or product approvals. In addition, there is a high failure rate for drugs and biologic products proceeding through clinical trials and failure can occur at any stage of testing. Moreover, additional clinical trials may be required if clinical trial results are negative or inconclusive, which would require us to incur additional costs and significant delays. In addition, data obtained from preclinical and clinical activities are subject to varying interpretations, which may delay, limit or prevent regulatory approval. In any event, it is impossible to predict when or if any of our product candidates will prove safe and effective in humans or will receive regulatory approval. Owing in part to the complexity of biological pathways, our product candidates might not demonstrate in patients the biochemical and pharmacological properties we anticipate based on laboratory studies or earlier-stage clinical trials, and they may interact with human biological systems or other drugs in unforeseen, ineffective or harmful ways.

In addition, the design of a clinical trial can determine whether its results will support approval of a product, and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. Because we have limited experience designing clinical trials, we may be unable to design and execute a clinical trial to support regulatory approval.

Further, we expect that certain of our current product candidates will, and future product candidates may, require chronic administration. The need for chronic administration increases the risk that participants in our clinical trials will fail to comply with our dosing regimens. If participants fail to comply, we may not be able to generate clinical data in our trials acceptable to the FDA or foreign regulatory authorities. The need for chronic administration also increases the risk that our clinical drug development programs may not uncover all possible adverse events that patients who take our products may eventually experience. The number of patients exposed to treatment with, and the average exposure time to, our product candidates in clinical development programs may be inadequate to detect rare adverse events or chance findings that may only be detected once our products are administered to more patients and for longer periods of time.

If we are unable to successfully discover, develop or enable our collaborators to develop drugs that are effective and safe in humans, we will not have a viable business.

Our most advanced clinical-stage product candidate, aldafermin, and MK-3655, which is being developed by our collaborator, Merck, are being developed for the treatment of NASH, an indication for which there are no approved products. This makes it difficult to predict the timing, cost and potential success of their clinical development and regulatory approval for the treatment of NASH.

We are developing aldafermin, and our collaborator is developing MK-3655, for the treatment of NASH, an indication for which there are no approved products. Implementation of new, or changes to, guidance or interpretations from the FDA or comparable foreign authorities with respect to approval pathways, such as draft guidance documents from the FDA for the development of products for the treatment of NASH that issued in 2018 and 2019 and from the European Medicines Agency, or EMA, that issued in 2018, may impact the path for regulatory approval for NASH therapies. Further, as we and other companies advance clinical trials for potential NASH therapies, we expect that the path for regulatory approval for NASH therapies may continue to evolve as companies refine their regulatory approval strategies and interact with regulatory authorities. Such evolution may impact our future clinical trial designs, including trial size and endpoints, in ways that we cannot currently predict.

In addition, certain of our competitors have recently experienced regulatory setbacks for NASH therapies following communications from the FDA. We currently do not know the impact, if any, that these setbacks could have on the path for regulatory approval for NASH therapies generally or for aldafermin and MK-3655 in particular. If the clinical trials for aldafermin and MK-3655 are not designed in a manner that, even if successful, support regulatory approval due to shifting approval pathways or for other reasons, those product candidates may be delayed in obtaining approval or may never be approved which could have a material adverse effect on our business, operating results and prospects.

Success in preclinical studies or earlier-stage clinical trials may not be indicative of results in future clinical trials.

To date, the data supporting our drug discovery and development programs are derived from laboratory and preclinical studies and earlier-stage clinical trials. Success in preclinical studies and earlier-stage clinical trials does not ensure that later clinical trials will generate the same results or otherwise provide adequate data to demonstrate the effectiveness and safety of our product candidates. In this regard, despite the results reported in our Phase 1 and 2 clinical trials for aldafermin, in Phase 1 clinical trials for MK-3655, NGM621 and NGM120 and in preclinical studies for our other product candidates, including NGM707 and NGM438, future clinical trials in humans may show that one or more of our product candidates are not safe and effective, in which event we may need to abandon development of such product candidates. In fact, many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials even after achieving promising results in preclinical studies and earlier-stage clinical trials. Similarly, preliminary data and interim results from clinical trials may not be predictive of final results. For example, the results we obtained in our Phase 1 trials of aldafermin and in our completed Phase 2 trial, including the data from the fourth and final 24-week expansion cohort of that trial in patients with NASH with fibrosis stage F2 or F3, may not be indicative of the future results we obtain from our ongoing ALPINE 2/3 and ALPINE 4 trials and any Phase 3 trial. In addition, some of our clinical trials involve small patient populations, sometimes at single sites, and the results of these clinical trials may be subject to substantial variability and may not be indicative of either future interim results or final results.

We may not successfully identify new product candidates to expand our development pipeline.

The success of our business depends primarily upon our ability to identify and validate new therapeutic candidates, and to identify, develop and commercialize protein and antibody therapeutics. Research programs to identify new product candidates require substantial technical, financial and human resources, and our research methodology may not successfully identify medically-relevant protein or antibody therapeutics or new product candidates. In addition, our drug discovery efforts tend to identify and select novel, untested proteins in the particular disease indication we are pursuing, which we may fail to validate after further research work. Moreover, our research efforts may initially show promise in discovering potential new protein and antibody therapeutics, yet fail to yield product candidates for clinical development for multiple reasons. For example, potential product candidates may, on further study, be shown to have inadequate efficacy, harmful side effects, suboptimal drug profiles or other characteristics suggesting that they are unlikely to be commercially viable products. Our inability to successfully identify new product candidates to advance into clinical trials could have a material adverse effect on our business, operating results and prospects.

We are subject to many manufacturing risks, any of which could substantially increase our costs and limit supply of our product candidates and any future products.

We have limited process development capabilities and have access only to external manufacturing capabilities. We do not have, and we do not currently plan to acquire or develop, the facilities or capabilities to manufacture bulk drug substance or filled drug product for use in clinical trials or commercialization. Our reliance on third-party manufacturers entails risks to which we would not be subject if we manufactured product candidates or products ourselves, including risks related to reliance on third parties for regulatory compliance and quality assurance, the possibility of breach of the manufacturing agreement by third parties because of factors beyond our control (including a failure to manufacture our product candidates or any products we may eventually commercialize in accordance with our specifications) and the possibility of termination or nonrenewal of agreements by third parties, based on their own business priorities, at a time that is costly or damaging to us. In addition, we do not have a long-term supply agreement with any third-party manufacturer.

To date, aldafermin and our other product candidates have been manufactured by third-party manufacturers solely for preclinical studies and relatively small clinical trials. These manufacturers may not be able to scale production to the larger quantities required for large clinical trials and for commercialization. In this regard, if any of our product candidates are approved by the FDA or other regulatory agencies for commercial sale, we or our collaborator may need to manufacture it in large quantities. We intend to use third-party manufacturers for commercial quantities of aldafermin, NGM120, NGM621, NGM707 and NGM438, to the extent we advance these product candidates, and will rely on Merck to determine whether to utilize a third-party manufacturer or Merck's internal manufacturing capacity for MK-3655 and other licensed product candidates. The process of manufacturing aldafermin and our other product candidates is complex, highly regulated and subject to several risks, including:

- the process of manufacturing biologics is susceptible to product loss due to contamination, equipment failure, improper installation or operation of equipment, vendor or operator error and improper storage conditions. Even minor deviations from normal manufacturing processes could result in reduced production yields, product defects and other supply disruptions. If microbial, viral or other contaminations are discovered in our products or in the manufacturing facilities in which our products are made, the manufacturing facilities may need to be closed for an extended period of time to investigate and eliminate the contamination;

- a third-party manufacturer of a product candidate subject to our collaboration with Merck may fail to qualify upon an audit by Merck;

- the manufacturing facilities in which our products are made could be adversely affected by equipment failures, labor and raw material shortages, turnover of qualified staff, financial difficulties of our contract manufacturers, including as a result of the evolving effects of the COVID-19 pandemic, natural disasters, power failures, local political unrest and numerous other factors; and

- any adverse developments affecting manufacturing operations or the scale up of manufacturing operations for our products may result in shipment delays, inventory shortages, lot failures, product withdrawals or recalls or other interruptions in the supply of our product candidates. We may also have to record inventory write-offs and incur other charges and expenses for product candidates or drug substances that fail to meet specifications or cannot be used before their expiration dates. In addition, for out of specification materials, we may need to undertake costly remediation efforts or seek costlier manufacturing alternatives.

We also have a single source of supply for aldafermin and most of our other product candidates, including the drug substances used in manufacturing them. Single sourcing minimizes our leverage with our contract manufacturers, who may take advantage of our reliance on them to increase the pricing of their manufacturing services. Single sourcing also imposes a risk of interruption in supply in the event of manufacturing, quality or compliance difficulties. In addition, we do not currently have arrangements in place for redundant supply for bulk drug substances or drug product. If one of our suppliers fails or refuses to supply us for any reason, it would take a significant amount of time and cost to implement and execute the necessary technology transfer to, and to qualify, a new supplier. The FDA or comparable foreign regulatory authority must approve manufacturers of drug substance and drug product. If there are any delays in qualifying new suppliers or facilities or a new supplier is unable to meet the requirements of the FDA or comparable foreign regulatory authority for approval, there could be a shortage of drug substance or drug product for use in clinical trials with respect to the affected product candidates.

In addition, the operations of our third-party manufacturers may be requisitioned, diverted or allocated by U.S. or foreign government orders such as under emergency, disaster and civil defense declarations in connection with the COVID-19 pandemic or otherwise. As an example, in 2020, the Defense Production Act was invoked pursuant to which the U.S. government may, among other things, require domestic industries to provide essential goods and services needed for the national defense, such as drug material or other supplies needed to treat COVID-19 patients or to produce or distribute vaccines, which could require our third-party manufacturers to allocate manufacturing capacity in a way that delays or interrupts our supply of clinical trial material.

We have entered into third-party supply agreements for the production of aldafermin for our clinical trials with Lonza Ltd, or Lonza, for Phase 3 and commercial supplies of the aldafermin drug substance. If our third-party suppliers, including Lonza or our aldafermin drug product manufacturer, are not able to provide us with sufficient

quantities of aldafermin for our clinical trials on a timely basis, or at all, whether due to production shortages or other supply delays or interruptions resulting from the ongoing COVID-19 pandemic or otherwise, our clinical trials or regulatory approval may be delayed. In this regard, although significant portions of our research and development resources are focused, and will continue to be focused, on activities required to prepare aldafermin for potential regulatory approval for the treatment of NASH, including manufacturing of clinical trial material and preparation for potential Phase 3 testing, if Lonza and/or our drug product manufacturer experience difficulties in scaling production or experience product loss due to contamination, equipment failure, improper installation or operation of equipment, vendor or operator error, turnover of qualified staff or improper storage conditions, the potential Phase 3 testing of aldafermin would be delayed, perhaps substantially, which could materially and adversely affect our business. Moreover, our aldafermin drug product manufacturer has advised us that it could be required under orders of the U.S. government to allocate manufacturing capacity to the manufacture or distribution of COVID-19 vaccines. If Lonza and/or our aldafermin drug product manufacturer become subject to acts or orders of U.S. or foreign government entities to allocate manufacturing capacity to the manufacture or distribution of COVID-19 vaccines or medical supplies needed to treat COVID-19 patients, this could also delay, perhaps substantially, our ongoing and planned aldafermin trials, which could materially and adversely affect our business.

Each of our product candidates uses certain raw materials for its manufacture, such as reagents that support cell growth. Some of these materials only have a single supplier and are purchased as necessary without a long-term supply agreement in place. In addition, our drug products require the use of pre-filled syringes or syringe components which have been the subject of shortages amplified by the COVID-19 pandemic due to their use in, among other things, COVID-19 vaccine production. Any significant delay in the acquisition or decrease in the availability of these raw materials, pre-filled syringes or syringe components could considerably delay the manufacture of our product candidates or the conduct of our clinical trials, which could adversely impact the timing or completion of any ongoing and planned trials or the timing of regulatory approvals, if any, of our product candidates.

The manufacture of biologic products is complex, highly regulated and requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers of biologic products often encounter difficulties in production, particularly in scaling up and validating initial production and ensuring the avoidance of contamination. These problems include difficulties with production costs and yields, quality control, including stability of the product, quality assurance testing, operator error and shortages of qualified personnel, as well as compliance with strictly enforced federal, state and foreign regulations. We cannot ensure that any stability or other issues relating to the manufacture of our product candidates will not occur in the future.

Any delay or interruption in the supply of clinical trial material could delay the completion of clinical trials, increase the costs associated with maintaining clinical trial programs and, depending upon the period of delay, require us to commence new clinical trials at additional expense or terminate clinical trials completely.

Our product candidates may cause undesirable side effects or adverse events or have other properties or safety risks, which could delay or prevent continued clinical development or their regulatory approval or limit the commercial profile of any approved label.

Adverse events, undesirable side effects or similar safety issues caused by our product candidates could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or other comparable foreign regulatory authorities. Additional clinical trials may be required to evaluate the safety profile of our product candidates. Patients in certain of our ongoing or planned clinical trials, particularly those with NASH with more advanced fibrosis and patients with cancer, also often commonly enter our trials with significant comorbidities or advanced life-threatening illness and/or are treated in the trial with our product candidate in combination with other medications, including chemotherapy or other approved cancer treatments. As a result, patients in our clinical trials can be expected to experience some adverse events, including death, or side effects that are not or may not be related to treatment with our product candidates. Nonetheless, the occurrence of adverse events or side effects, whether or not related to our product candidates, could impact the success of our clinical trials.

In clinical trials of aldafermin to date, a number of serious adverse events, or SAEs, most of which have been mostly classified as mild to moderate, have been reported in the aldafermin treatment arms of our completed Phase 1 and Phase 2 clinical trials of aldafermin, including one patient receiving aldafermin in Cohort 1

of our Phase 2 clinical trial who experienced an SAE, acute pancreatitis, that was assessed as possibly related to aldafermin. Patients have also experienced, and we have reported, SAEs in our completed trials of MK-3655, NGM621 and NGM120. SAEs reported in our ongoing Phase 2 CATALINA trial of NGM621, which remains blinded, include worsening of vision in non-study eye. We expect that patients in our clinical trials will continue to experience adverse events and SAEs and we will continue to monitor those SAEs for any signals of concern regarding the safety and tolerability of our product candidates. If patients in any of our clinical trials experience a high or unacceptable severity and prevalence of side effects, including particularly SAEs, it could affect patient recruitment or the ability of enrolled patients to complete their treatment in a clinical trial or result in failure to obtain regulatory approval for our product candidates or product liability claims.

In addition, significant increases in serum levels of low-density lipoprotein, or LDL, cholesterol were observed in clinical trials of aldafermin in patients with NASH and type 2 diabetes. Serum levels of LDL cholesterol were brought back to baseline levels with concomitant statin use in patients with NASH; however, the impact of these drug-induced changes in LDL cholesterol are unknown. Generally, sustained and prolonged LDL cholesterol elevations in untreated patients are associated with cardiovascular disease through atherosclerotic plaque development. While in Cohorts 2, 3 and 4 of our completed Phase 2 clinical trial of aldafermin we demonstrated the ability of concomitant statin use to mitigate the serum LDL cholesterol elevations driven by aldafermin activity, aldafermin's impact on LDL may negatively impact market acceptance of an approved aldafermin product.

Our product candidates, including aldafermin, which is an engineered variant of the human hormone fibroblast growth factor 19, or FGF19, protein, are protein or antibody therapeutics. Protein and antibody therapeutics can sometimes induce host immune responses that can cause the production of anti-drug antibodies, or ADAs. In some cases, ADAs have no effect. In other cases, ADAs may neutralize the effectiveness of the product candidate, can require that higher doses be used to obtain a therapeutic effect or can cross react with substances naturally occurring in a subject's body which can cause unintended effects, including potential impacts on efficacy and adverse events. Some patients treated with aldafermin in our completed clinical trials have developed ADAs against aldafermin, and in some cases, those antibodies were neutralizing or appeared to cross react with the patient's naturally occurring FGF19. We are developing an assay to measure the presence of ADAs against aldafermin for our ongoing NASH program, which will need to be used to test patient samples and then evaluated by regulatory agencies. The presence of ADAs was also observed in our Phase 1 MK-3655 trial. If we or Merck as appropriate, are required to undertake substantial additional testing as a result of the detection of ADAs in subjects using aldafermin, MK-3655 or any other product candidate, the costs of our clinical trials may increase. If we or Merck determine that ADAs are causing safety or efficacy concerns when using any of our product candidates, we or Merck may need to delay or halt clinical trials of our product candidates and the affected product candidates may never obtain regulatory approval. We cannot provide assurance that the detection of ADAs will not be higher than we have observed historically or that observed rates will not later be found to limit drug exposure or cause adverse safety events, or that the detection of ADAs will not otherwise result in the non-approvability of any of our product candidates.

In clinical trials to date, NGM621 has been delivered to clinical sites in vials and then administered to patients using commercially available single-use syringes. The manufacturer of a commercially available single-use syringe widely used by ophthalmologists for IVT injections, including by most investigators in the Phase 2 CATALINA trial, has issued a notice that such single-use syringes should not be used for ocular medications due to an increased potential for adverse eye conditions. We have not experienced any safety concerns in our ongoing or completed NGM621 clinical trials relating to syringe use; however, we have communicated with the FDA and our study investigators regarding this issue and are evaluating alternative syringes that may be suitable for intraocular use. However, if any patient in our clinical trials experiences a safety event due to the use of these commercially available single-use syringes, we could be required to delay or halt our clinical trials or may be subject to product liability claims.

Future results of our trials could reveal a high and unacceptable severity and prevalence of side effects, SAEs, ADAs, safety issues or other negative or otherwise unexpected characteristics. The occurrence of those issues could affect patient recruitment or the ability of enrolled patients to complete their treatment in a clinical trial, result in failure to obtain regulatory approval for our product candidates or product liability claims or impact market acceptance of our products. Any of these occurrences could materially and adversely affect our business, financial condition and prospects.

Our most advanced clinical-stage product candidate, aldafermin, is a modified version of a human hormone that has been associated with liver cancer in rodent testing.

The aldafermin IND that we filed in February 2014 for type 2 diabetes was placed on clinical hold by the FDA Division of Metabolism and Endocrinology Products pending receipt of additional information relating to the potential risk of proliferative effects of aldafermin in the livers of non-human primates and mice based on concerns relating to the observation that human FGF19 can induce hepatocellular proliferation in rodents. We withdrew this IND in January 2015, as we determined that we would not further study aldafermin in type 2 diabetes after we analyzed the results of the Phase 2 clinical trial of aldafermin in type 2 diabetes and made the determination to pursue NASH and other liver indications. To date, the FDA Division of Hepatology and Nutrition, which is responsible for the NASH indication, has not requested any additional information regarding the potential for aldafermin to induce hepatocellular proliferation. We have received feedback from the FDA Carcinogenicity Assessment Committee that our preclinical data through six-month chronic toxicology studies in mice and monkeys support a single species, two-year carcinogenicity assessment in rats. The human hormone and the rodent ortholog for FGF19 share a sequence identity of approximately 50%, which means that the results of these studies of aldafermin in rats are not necessarily predictive of the potential risk of carcinogenicity in humans. To our knowledge, neither FGF19 nor any variant thereof other than aldafermin has ever been tested in humans. We believe we have identified a modified version of FGF19 that does not exhibit the cancer-causing effects of native human FGF19 in rodents. We believe that aldafermin will have a superior therapeutic profile to FGF19 based on preclinical data showing reduced fasting blood glucose levels, fed insulin levels and bile acid suppression in animals. However, we may be incorrect in these beliefs, and we cannot be sure that regulators will view our product candidate as safe or that physicians will view our product candidates as safe and superior to alternative treatments. Concerns about the association between FGF19 and liver cancer could have an adverse effect on our ability to develop and commercialize aldafermin.

We have no experience in sales, marketing and distribution and may have to enter into agreements with third parties to perform these functions, which could prevent us from successfully commercializing our product candidates.

We currently have no sales, marketing or distribution capabilities. To commercialize our product candidates outside of the Merck collaboration, or to commercialize products subject to the Merck collaboration for which we may in the future exercise our co-detailing rights in the United States, we must either develop our own sales, marketing and distribution capabilities or make arrangements with third parties to perform these services for us. If we exercise our co-detailing rights in the United States with respect to the Merck collaboration, we will be responsible for the costs of fielding such a sales force, subject to partial offset pursuant to the formula by which profits are allocated, and the risks of attracting, retaining, motivating and ensuring the compliance of such a sales force with the various requirements of the Merck collaboration and applicable law. If we decide to market any of our products on our own, we will have to commit significant resources to developing a marketing and sales force and supporting distribution capabilities. If we decide to enter into arrangements with third parties for performance of these services, we may find that they are not available on terms acceptable to us, or at all. If we are not able to establish and maintain successful arrangements with third parties or build our own sales and marketing infrastructure, we may not be able to commercialize our product candidates, which would adversely affect our business, operating results and prospects.

We may fail to select or capitalize on the most scientifically, clinically and commercially promising or profitable product candidates.

We have limited technical, managerial and financial resources to determine which of our product candidates should proceed to initial clinical trials, later-stage clinical development and potential commercialization. We may make incorrect determinations in allocating resources among these product candidates. Our decisions to allocate our research and development, management and financial resources toward particular product candidates or therapeutic areas may not lead to the development of viable commercial products and may divert resources from better opportunities. Similarly, our decisions to delay or terminate drug development programs, such as our decision to suspend activities related to NGM386, NGM395, NGM621 administered systemically and NGM217 to concentrate our resources on other product candidates, also may be incorrect and could cause us to miss valuable opportunities.

Under the current terms of our Collaboration Agreement with Merck, we have the right, exercisable during a specified period prior to the commencement of Phase 3 clinical testing of the applicable product candidate, to convert our economic participation from a milestones and net sales royalty arrangement into a cost and profit share arrangement. If we exercise the cost and profit share right, we have the ability to participate in a co-detailing relationship in the United States. Due to the limited exercise period, we may have to choose whether a product candidate will be subject to a cost and profit share arrangement before we have as much information as we would like, including whether and when such program may receive FDA approval of the applicable BLA. As a result of such incomplete information or due to incorrect analysis by us, we may select a cost and profit share program that later proves to have less commercial potential than an alternative, or none at all, or may pass on a cost and profit-sharing program that proves commercially successful.

We must attract and retain highly skilled employees in order to succeed. If we are not able to retain our current senior management team, especially Dr. Jin-Long Chen, or continue to attract and retain qualified scientific, technical and business personnel, our business will suffer.

To succeed, we must recruit, retain, manage and motivate qualified clinical, scientific, technical and management personnel and we face significant competition for experienced personnel. If we do not succeed in attracting and retaining qualified personnel, particularly at the management level, it could adversely affect our ability to execute our business plan and harm our operating results. An important element of our strategy is to take advantage of the research and development expertise of our current management. The loss of any one of our executive officers, including, in particular, Dr. Jin-Long Chen, our Chief Scientific Officer, could result in a significant loss in the knowledge and experience that we, as an organization, possess and could cause significant delays, or outright failure, in the development and further commercialization of our product candidates.

To fully realize the research and development support committed under our collaboration with Merck, we will need to maintain a significant number of qualified research and development personnel. There is intense competition for qualified personnel, including management, in the technical fields in which we operate, and we may not be able to attract and retain qualified personnel necessary for the successful research, development and future commercialization, if any, of our product candidates. In particular, the hiring environment in the San Francisco Bay Area, where we are headquartered, is extremely competitive. Many of the other pharmaceutical companies that we compete against for qualified personnel have greater financial and other 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 unable to continue to attract and retain high-quality personnel, the rate and success with which we can discover and develop product candidates and our business will be limited.

We may encounter difficulties in managing our growth, which could adversely affect our operations.

Since executing the Collaboration Agreement in 2015, we have significantly increased our headcount and advanced our pipeline and the complexity of our operations, which has placed a strain on our administrative and operational infrastructure. We expect this strain to continue as we seek to maintain our growth and seek to obtain and manage relationships with third parties. Our ability to manage our operations and growth effectively depends upon the continual improvement of our procedures, remote work policies, reporting systems and operational, financial and management controls, particularly in light of the evolving effects of the COVID-19 pandemic. We may not be able to expand or identify sufficiently-sized facilities to accommodate our growth, particularly given our location in South San Francisco, California and the current high demand for, and restricted supply of, research and development facilities in this market. We may not be able to implement administrative and operational improvements in an efficient or timely manner and may discover deficiencies in existing systems and controls. If we do not meet these challenges, we may be unable to take advantage of market opportunities, execute our business strategies or respond to competitive pressures, which in turn may slow our growth or give rise to inefficiencies that would increase our losses.

We face substantial competition, which may result in others discovering, developing or commercializing products before or more successfully than us.

The biopharmaceutical industry is intensely competitive and subject to rapid and significant technological change. Our competitors include multinational pharmaceutical companies, specialized biotechnology companies

and universities and other research institutions. A number of pharmaceutical and biotechnology companies are pursuing the development or marketing of pharmaceuticals that target the same diseases that are targeted by our most advanced product candidates. It is probable that the number of companies seeking to develop products and therapies for the treatment of liver and metabolic diseases, retinal diseases and cancer will increase. Many of our competitors have substantially greater financial, technical, human and other resources than we do and may be better equipped to develop, manufacture and market technologically superior products. In addition, many of these competitors have significantly greater experience than we have in undertaking preclinical studies and human clinical trials of new pharmaceutical products and in obtaining regulatory approvals of human therapeutic products. Accordingly, our competitors may succeed in obtaining FDA approval for superior products or for other products that would compete with our product candidates. Many of our competitors have established distribution channels and commercial infrastructure to support the commercialization of their products, whereas we have no such channel or capabilities. In addition, many competitors have greater name recognition and more extensive collaborative relationships. Smaller and earlier-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies.

Our competitors may obtain regulatory approval of their products more rapidly than us or may obtain patent protection or other intellectual property rights that limit our ability to develop or commercialize our product candidates. Our competitors may also develop drugs that are more effective, more convenient, more widely used and less costly or have a better safety profile than our products and these competitors may also be more successful than us in manufacturing and marketing their products. If we are unable to compete effectively against these companies, then we may not be able to commercialize our product candidates or achieve a competitive position in the market. These companies also compete with us in recruiting and retaining qualified scientific, management and commercial personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Although we believe there are no FDA-approved therapies that specifically target the signaling pathways that our current product candidates are designed to modulate or inhibit, there are numerous currently approved therapies for treating the same diseases or indications (other than NASH) for which our product candidates may be useful and many of these currently approved therapies act through mechanisms similar to our product candidates. Many of these approved drugs are well-established therapies or products and are widely accepted by physicians, patients and third-party payors. Some of these drugs are branded and subject to patent protection, and others are available on a generic basis. Insurers and other third-party payors may also encourage the use of generic products or specific branded products. We expect that if our product candidates are approved, they will be priced at a significant premium over competitive generic products, including branded generic products. This may make it difficult for us to differentiate our products from currently approved therapies, which may adversely impact our business strategy. In addition, many companies are developing new therapeutics, and we cannot predict what the standard of care will be as our product candidates progress through clinical development. For more information regarding the competition that our most advanced product candidates face, or may face, see the discussion of specific competition for each product candidate in “Business—Key Therapeutic Areas and Pipeline Programs” in Part I, Item 1 of this Annual Report on Form 10-K.

Our product candidates may not achieve adequate market acceptance among physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

Even if our product candidates receive regulatory approval, they may not gain adequate market acceptance among physicians, patients, healthcare payors and others in the medical community. Demonstrating the safety and efficacy of our product candidates and obtaining regulatory approvals will not guarantee future revenue. The degree of market acceptance of any of our approved product candidates will depend on a number of factors, including:

- the efficacy and safety profile of the product candidate as demonstrated in clinical trials;
- the timing of market introduction of the product candidate, as well as competitive products;
- the clinical indications for which the product candidate is approved;
- acceptance of the product candidate as a safe and effective treatment by clinics and patients;
- the potential and perceived advantages of the product candidate over alternative treatments, including any similar generic treatments;

- the inclusion or exclusion of the product candidate from treatment guidelines established by various physician groups and the viewpoints of influential physicians with respect to the product candidate;
- the cost of treatment relative to alternative treatments;
- the availability of coverage and adequate reimbursement and pricing by third parties and government authorities as described below;
- the relative convenience and ease of administration;
- the frequency and severity of adverse events;
- the effectiveness of sales and marketing efforts; and
- any unfavorable publicity relating to the product candidate.

For example, aldafermin is currently administered via a once-daily subcutaneous injection. While we are undertaking efforts to develop formulations and presentations of aldafermin that allow for more convenient or less frequent dosing, there is no assurance that these efforts will be successful which may negatively impact market acceptance of an approved aldafermin product. In addition, see the risk factor titled "*Our product candidates may cause undesirable side effects or adverse events or have other properties or safety risks, which could delay or prevent continued clinical development or their regulatory approval or limit the commercial profile of any approved label*" above. If any product candidate is approved but does not achieve an adequate level of acceptance by such parties, we may not generate or derive sufficient revenue from that product candidate and may not become or remain profitable.

Even if we commercialize any of our product candidates, alone or with our partners, these products may become subject to unfavorable pricing regulations, third-party reimbursement practices or healthcare reform initiatives, which could harm our business.

The regulations that govern marketing approvals, pricing and reimbursement for new drug products vary widely from country to country. Current and future legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. In many regions, including Europe, Japan and Canada, the pricing of prescription drugs is controlled by the government. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. Regulatory agencies in those countries could determine that the pricing for our products should be based on prices of other commercially available drugs for the same disease, rather than allowing us to market our products at a premium as new drugs. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay or limit our commercial launch of the product, possibly for lengthy time periods, which could negatively impact the revenue we generate from the sale of the product in that particular country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if our product candidates obtain marketing approval.

Our commercial success also depends on coverage and adequate reimbursement of our product candidates by third-party payors, including government payors, private health insurers, health maintenance organizations and other organizations, which may be difficult or time-consuming to obtain, may be limited in scope and may not be obtained in all jurisdictions in which we may seek to market our products. Governments and private insurers closely examine medical products to determine whether they should be covered by reimbursement and, if so, the level of reimbursement that will apply. Government authorities and other third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that coverage and reimbursement will be available for any product that we or our partners commercialize and, if reimbursement is available, what the level of reimbursement will be. Coverage and reimbursement may impact the demand for, or the price of, any product candidate for which we or our partners obtain marketing approval. If coverage and reimbursement are not available or reimbursement is available only to limited levels, we and our

partners may not be able to successfully commercialize any product candidate for which marketing approval is obtained.

There may be significant delays in obtaining coverage and reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which the drug is approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for coverage and reimbursement does not imply that a drug will be paid for in all cases or at a rate that covers our costs, including costs of research, development, manufacture, sale and distribution. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may only be temporary. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost drugs and may be incorporated into existing payments for other services. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Our inability to promptly obtain coverage and profitable reimbursement rates from both government-funded and private payors for any approved products that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

The advancement of healthcare reform may negatively impact our ability to profitably sell our product candidates, if approved.

Third-party payors, whether domestic or foreign, or governmental or commercial, are developing increasingly sophisticated methods of controlling healthcare costs. The United States and many foreign jurisdictions have enacted or proposed legislative and regulatory changes affecting 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 for which we obtain marketing approval.

In March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively referred to as the ACA, was enacted, which includes measures that have significantly changed the way health care is financed by both governmental and private insurers. There have been executive, judicial and congressional challenges to certain aspects of the ACA.

In addition, while Congress has not passed comprehensive legislation repealing the ACA, it has introduced legislation to modify certain provisions. Congress likely will consider other legislation to modify or replace additional elements of the ACA. It is unclear how these efforts to repeal and replace the ACA, or other appeals, will impact the ACA and our business. For example, the 2017 Tax Act repealed the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage that is commonly referred to as the “individual mandate.” In December 2019, a U.S. District Court upheld a ruling that the ACA is unconstitutional in its entirety because the “individual mandate” was repealed by Congress. The Supreme Court of the United States is currently reviewing this case, although it is unclear when a decision will be made. It is also unclear how the Supreme Court ruling, other such litigation and the healthcare reform measures of the Biden administration will impact the ACA or our business.

Recently, there has also been increasing executive, legislative and enforcement interest in the United States with respect to drug pricing practices. There have been U.S. congressional inquiries, presidential executive orders and proposed and enacted 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 that the healthcare reform measures that have been adopted and may be adopted in the future may result in more rigorous coverage criteria and additional downward pressure on the price that we receive for any approved product and could seriously harm our future revenues. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our products.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. It is also possible that additional governmental action is taken in response to the COVID-19 pandemic. Such reforms could have an adverse effect on anticipated revenue from product candidates that we may

successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop product candidates.

We cannot predict the likelihood, nature or extent of healthcare reform initiatives that may arise from future legislation or administrative action, particularly under the new Biden administration. If we or any third parties we may engage are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we or such third parties are not able to maintain regulatory compliance, our product candidates may lose any regulatory approval that may have been obtained and we may not achieve or sustain profitability.

Our international operations may expose us to business, regulatory, political, operational, financial, pricing and reimbursement risks associated with doing business outside of the United States.

Our business is subject to risks associated with conducting business internationally. Some of our suppliers and clinical trial sites are located outside of the United States. Furthermore, if we, Merck or any future collaborator succeeds in developing any of our product candidates, we intend to market them in the European Union, or the EU, and other jurisdictions in addition to the United States. If approved, we, Merck or any future collaborator may hire sales representatives and conduct physician and patient association outreach activities outside of the United States. Doing business internationally involves a number of challenges and risks, including but not limited to:

- multiple, conflicting and changing laws and regulations, such as privacy regulations, tax laws, export and import restrictions, employment laws, regulatory requirements and other governmental approvals, permits and licenses;
- failure by us to obtain and maintain regulatory approvals for the use of our products in various countries;
- rejection or qualification of foreign clinical trial data by the competent authorities of other countries;
- delays or interruptions in the supply of clinical trial material resulting from any events affecting raw material supply or manufacturing capabilities abroad, including those that may result from the ongoing COVID-19 pandemic;
- additional potentially relevant third-party patent rights;
- complexities and difficulties in obtaining, maintaining, protecting and enforcing our intellectual property;
- difficulties in staffing and managing foreign operations;
- complexities associated with managing multiple payor reimbursement regimes, government payors or patient self-pay systems;
- limits on our ability to penetrate international markets;
- financial risks, such as longer payment cycles, difficulty collecting accounts receivable, the impact of local and regional financial crises on demand and payment for our products and exposure to foreign currency exchange rate fluctuations;
- natural disasters, political and economic instability, including wars, terrorism and political unrest, outbreak of disease, including COVID-19 and related shelter-in-place orders, travel, social distancing and quarantine policies, boycotts, curtailment of trade and other business restrictions; and
- regulatory and compliance risks that relate to anti-corruption compliance and record-keeping that may fall within the purview of the U.S. Foreign Corrupt Practices Act, its accounting provisions or its anti-bribery provisions or provisions of anti-corruption or anti-bribery laws in other countries.

Any of these factors could harm our ongoing international clinical operations and supply chain, as well as any future international expansion and operations and, consequently, our business, financial condition, prospects and results of operations.

Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of any products that we may develop.

We face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and will face an even greater risk if we or our collaborator commercializes any resulting products. Product liability claims may be brought against us by subjects enrolled in our clinical trials, patients, healthcare providers or others using, administering or selling our products. If we cannot successfully defend ourselves against claims that our product candidates or products that we may develop caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or products that we may develop;
- termination of clinical trial sites or entire trial programs;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend the related litigation;
- substantial monetary awards to trial subjects or patients;
- loss of revenue;
- diversion of management and scientific resources from our business operations; and
- the inability to commercialize any products that we may develop.

Our clinical trial liability insurance coverage may not adequately cover all liabilities that we may incur. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise. Our inability to obtain product liability insurance at an acceptable cost or to otherwise protect against potential product liability claims could prevent or delay the commercialization of any products or product candidates that we develop. We intend to expand our insurance coverage for products to include the sale of commercial products if we obtain marketing approval for our product candidates in development, but we may be unable to obtain commercially reasonable product liability insurance for any products approved for marketing. Large judgments have been awarded in class action lawsuits based on drugs that had unanticipated side effects. If we are sued for any injury caused by our products, product candidates or processes, our liability could exceed our product liability insurance coverage and our total assets. Claims against us, regardless of their merit or potential outcome, may also generate negative publicity or hurt our ability to obtain physician endorsement of our products or expand our business.

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

Healthcare providers, including physicians, and third-party payors will play a primary role in the recommendation and prescription of any product candidates for which we or our collaborator obtains marketing approval. Our arrangements with healthcare providers, third-party payors and customers 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 research, market, sell and distribute our products for which we or our collaborator obtains marketing approval. Restrictions under applicable federal and state healthcare laws and regulations, include the following:

- the federal Anti-Kickback Statute prohibits persons from, among other things, knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, the referral of an individual for the furnishing or arranging for the furnishing, or the purchase, lease or order, or arranging for or recommending purchase, lease or order, of any good or service for which payment may be made under a federal healthcare program, such as Medicare and Medicaid;

- the federal False Claims Act, or FCA, imposes criminal and civil penalties, including through civil whistleblower or *qui tam* actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;

- the federal Health Insurance Portability and Accountability Act, or HIPAA, imposes criminal liability for knowingly and willfully executing a scheme to defraud any healthcare benefit program, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense or knowingly and willfully making false statements relating to healthcare matters;

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and its implementing regulations, also imposes obligations on certain covered entity healthcare providers, health plans and healthcare clearinghouses, and their business associates that perform certain services involving the use or disclosure of individually identifiable health information as well as their covered subcontractors, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information;

- the federal Open Payments program, created under Section 6002 of the ACA and its implementing regulations, requires manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the United States Department of Health and Human Services, or HHS, information related to "payments or other transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals and applicable manufacturers and applicable group purchasing organizations to report annually to the HHS ownership and investment interests held by physicians (as defined above) and their immediate family members. Beginning in 2022, applicable manufacturers also will be required to report such information regarding its payments and transfers of value to physician assistants, nurse practitioners, anesthesiologist assistants, clinical nurse specialists, certified registered nurse anesthetists and certified nurse midwives during the previous year; 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; 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 local laws requiring the registration of pharmaceutical sales representatives; 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, marketing expenditures or pricing; and state and foreign laws that govern 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.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental 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 our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, additional regulatory oversight, imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found not to be in compliance with applicable laws, that person or entity may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

Our operations are vulnerable to interruption by fire, earthquake, power loss, telecommunications failure, terrorist activity and other events beyond our control, which could harm our business.

Our facilities have experienced electrical blackouts as a result of a shortage of available electrical power. Future blackouts, which may be implemented by the local electricity provider in the face of high winds and dry conditions, could disrupt our operations. Our facility is located in a seismically active region. We have not undertaken a systematic analysis of the potential consequences to our business and financial results from a major earthquake, fire, power loss, terrorist activity or other disasters and do not have a comprehensive recovery plan for such disasters. In addition, we do not carry sufficient insurance to compensate us for actual losses from interruption of our business that may occur, and any losses or damages incurred by us could harm our business. In addition, the sole supplier of clinical drug substance for NGM120, NGM621, NGM707 and NGM438 is located in a region that has experienced political unrest. If our operations or the operations of third parties providing services to us experiences are disrupted by any such occurrences, our business and future prospects may be negatively affected.

Our business is currently adversely affected and could be materially and adversely affected in the future by the effects of disease outbreaks, epidemics and pandemics, including by the evolving effects of the COVID-19 pandemic. The COVID-19 pandemic continues to adversely impact our business and could materially and adversely affect our operations, as well as the businesses or operations of our manufacturers, CROs or other third parties with whom we conduct business.

Disease outbreaks and epidemics in regions where we have concentrations of clinical trial sites or other business operations or pandemics, such as the COVID-19 pandemic, could adversely affect our business, including by causing significant disruptions in our operations and/or in the operations of third-party manufacturers and CROs upon whom we rely. For example, the COVID-19 pandemic has presented a substantial public health and economic challenge around the world and is affecting employees, patients, communities and business operations, as well as the United States and international economy and financial markets. In this regard, the COVID-19 pandemic and government measures taken in response have had a significant impact, both direct and indirect, on businesses and commerce, as significant reductions in business-related activities have occurred, supply chains have been disrupted and manufacturing and clinical development activities have been curtailed or suspended.

Remote work policies, quarantines, shelter-in-place and similar government orders, shutdowns or other restrictions on the conduct of business operations related to the COVID-19 pandemic could materially and adversely affect our operations. Following guidance from federal, state and local authorities, we transitioned to a remote work environment for the vast majority of our employees in March 2020, while maintaining essential in-person laboratory work and other essential business functions in order to advance key research and development initiatives, supported by the implementation of updated onsite safety procedures. In June 2020, following updated guidance from federal, state and local authorities, we re-opened our laboratory facilities for research activities that cannot be conducted remotely with heightened safety measures designed to minimize occupational exposure and reduce transmission of COVID-19 within our workplace. Although we have re-opened our laboratory facilities under these heightened safety measures, we may be forced to, or determine that we should, resume a more restrictive remote work model. In connection with these measures, we may be subject to claims based upon, arising out of or related to COVID-19 and our actions and responses thereto, including any determinations that we have made and may make in the future with respect to our onsite operations. Further, the effects of current and future governmental shelter-in-place orders and our remote work policies may materially and adversely impact productivity, disrupt our business and delay our clinical programs and timelines, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations on our ability to conduct our business in the ordinary course. For example, since we transitioned to a remote work model in March 2020, we experienced higher-than-normal employee turnover and an increased rate of hiring new employees. We cannot predict whether this higher turnover rate will continue and what its impact will be on productivity, whether these trends will continue or be exacerbated, when we will be permitted to return to an office-based working model or whether we will be required to adopt a more restrictive work model. Continuation of current or similar, and perhaps more severe, disruptions in our operations could materially and adversely impact our business, financial condition, results of operations and growth prospects.

As the pandemic continues, there may be continuing negative impacts on our ability to initiate new clinical trial sites, maintain enrollment of existing patients and enroll new patients, which may affect timelines in the

future. Our ability to attract additional clinical trial sites and principal investigators to conduct our clinical trials and to conduct the necessary clinical trial site initiation procedures has been and may continue to be impacted by quarantines, shelter-in-place and similar restrictions imposed by federal, state and local governments. These restrictions may also continue to prohibit or discourage patients from enrolling in, or continuing to participate in, our clinical trials. Principal investigators and clinical trial site staff, as healthcare providers, may have heightened exposure to COVID-19 and if their health is impacted by COVID-19 it could adversely impact the conduct of our clinical trials at their sites. Similarly, potential participants in our clinical trials, many of whom are particularly vulnerable, may be unwilling to enroll in, and enrolled patients may be unwilling to continue to participate in, our clinical trials due to concerns about traveling to sites for required screening and clinical trial visits and procedures. In this regard, we have experienced, from to time, a slower pace of clinical site initiation and enrollment than anticipated in certain of our clinical trials, including the ALPINE 4, CATALINA and NGM120 trials, and we have experienced a higher dropout rate than anticipated in our ALPINE 2/3 trial after we completed enrollment, due to factors such as the vulnerability of our studied patient populations, clinical trial site suspensions, reallocation of medical resources and the challenges of working remotely due to shelter-in-place and similar government orders, among other factors. Enrolled patients may also be unable to comply with clinical trial protocols if quarantines, shelter-in-place and similar restrictions continue to impede patient movement or interrupt healthcare services. Accordingly, we have developed and implemented additional clinical study policies and procedures designed to help protect patients from COVID-19 exposure as a result of their trial participation, which include the use of telemedicine visits, remote monitoring of patients and clinical trial sites, and other measures designed to ensure that data from clinical trials that may be disrupted as result of the pandemic are collected pursuant to the study protocol and consistent with current Good Clinical Practices, or cGCPs, with any material protocol deviation reviewed and approved by the clinical trial site IRB. If any of the foregoing efforts to mitigate the impact of the COVID-19 pandemic are not successful, or if the effects of the COVID-19 pandemic persist or become more severe, it could materially and adversely affect our clinical development timelines and our ability to obtain regulatory approvals of our product candidates and could significantly increase our costs.

We also could see an adverse impact on our ability to report clinical trial results, or interact with regulators, IRBs and ethics committees or other important agencies due to limitations in regulatory authority employee resources or otherwise. Moreover, we rely on CROs and other third parties to assist us with clinical development activities, and we cannot guarantee that they will continue to perform their contractual duties in a timely and satisfactory manner as a result of the COVID-19 pandemic.

Quarantines, shelter-in-place and similar government orders could impact personnel at third-party manufacturing facilities in the United States and other countries, or the availability or cost of materials, which would disrupt our supply chain and delay our clinical development efforts. Likewise, the operations of our third-party manufacturers may be requisitioned, diverted or allocated by U.S. or foreign government orders such as under emergency, disaster and civil defense declarations in connection with the COVID-19 pandemic or otherwise. Refer the risk factor titled “We are subject to many manufacturing risks, any of which could substantially increase our costs and limit supply of our product candidates and any future products.” In any event, if the effects of the COVID-19 pandemic persist or become more severe or more acutely impact geographies with particular relevance to our business, we could experience significant disruptions to our current and potential future clinical development timelines, impacts on our ability to obtain regulatory approvals of our product candidates and increases in our costs, all or any of which would adversely affect our business, financial condition, results of operations and growth prospects.

While the potential economic impact caused by, and the duration of, the COVID-19 pandemic may be difficult to assess or predict, the pandemic could result in significant and prolonged disruption of global financial markets, reducing our ability to access capital, which could in the future negatively affect the financial resources available to us. In addition, the current recession or additional market corrections resulting from, among other things, the spread of COVID-19 could materially affect our business and the value of our common stock. We also cannot predict how the evolving effects of the COVID-19 pandemic may influence the future decisions of Merck to license any programs available to it under the Collaboration Agreement, to exercise its remaining option to extend the research phase of the collaboration beyond March 16, 2022 or to reach agreement with us on the terms of a modified collaboration, if any.

While we expect the COVID-19 pandemic to continue to affect our business operations, the extent of the impact on our clinical development and regulatory efforts, our ability to raise sufficient additional capital on acceptable terms, if at all, the decisions of Merck and the value of and market for our common stock will depend

on future developments that are highly uncertain and cannot be predicted with confidence at this time. Such developments include the ultimate duration and severity of the pandemic, travel restrictions, quarantines, social distancing and business closure requirements in the United States and in other countries, and the effectiveness of actions taken globally to contain and treat COVID-19. To the extent the evolving effects of the COVID-19 pandemic adversely affects our business and results of operations, it also may have the effect of heightening many of the other risks and uncertainties described elsewhere in this ‘‘Risk Factors’’ section.

We, our CROs, our CMOs and other third parties we rely on could experience a cybersecurity incident that could harm our business.

We collect, store and transmit proprietary, confidential and sensitive information, including personal information in the course of our business. The information and data processed and stored in our technology systems, and those of our research collaborators, CROs, CMOs, contractors, consultants and other third parties on which we depend to operate our business, may be vulnerable to security breaches, loss, damage, corruption, unauthorized access, use or disclosure, or misappropriation. Such incidents also may result from errors or malfeasance by our personnel or the personnel of the third parties we work with, malware, viruses, software vulnerabilities, hacking, denial of service attacks, social engineering (including phishing), ransomware, credential stuffing or other cyberattacks, including attacks by state-sponsored organizations or sophisticated groups of hackers.

While we have developed systems and processes designed to protect the integrity, confidentiality and security of the confidential and personal information under our control, we cannot assure you that any security measures that we or our third-party service providers have implemented will be effective in preventing cybersecurity incidents. There are many different cyber-crime and hacking techniques, and as such techniques continue to evolve, we may be unable to anticipate attempted security breaches, identify them before our information is exploited or react in a timely manner.

As a result of the ongoing COVID-19 pandemic, certain functional areas of our workforce remain in a remote work environment and outside of our corporate network security protection boundaries, which imposes additional risks to our business, including increased risk of industrial espionage, phishing and other cybersecurity attacks, and unauthorized dissemination of proprietary or confidential information, any of which could have a material adverse effect on our business.

Despite our efforts to strengthen security and authentication measures, we have experienced an overall increase in cybersecurity incidents, none of which have caused material disruption to our business, or to our knowledge, involved a material security breach. In June 2019, a vendor that conducted bioanalytical services for some of our aldafermin clinical trials experienced a ransomware attack that resulted in a significant disruption to its IT systems but did not affect the integrity of our clinical sample data for aldafermin, as verified by independent vendors. More recently, in December 2020, we detected that an attacker had gained access to a single system on our network and unsuccessfully attempted to use that access to stage a broader attack against us. We or the third parties we rely on could experience a material system failure, security breach or other cybersecurity incident in the future, which could interrupt our operations disrupt our development programs and have a material adverse effect on our business, financial condition and results of operations. For example, the loss or corruption of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we rely on third parties for the manufacture of our product candidates, to analyze clinical trial samples and to conduct clinical trials, and cybersecurity incidents experienced by these third parties could have a material adverse effect on our business. Security breaches and other cybersecurity incidents affecting us or the third parties we rely on could also result in substantial remediation costs and expose us to litigation, regulatory enforcement action, fines, penalties and other liabilities.

We cannot be certain that our insurance coverage will be adequate for data security liabilities actually incurred, will continue to be available to us on economically reasonable terms, or at all, or that any insurer will not deny coverage as to any future claim. The successful assertion of one or more large claims against us that exceed available insurance coverage, or the occurrence of changes in our insurance policies, including premium increases or the imposition of large deductible or co-insurance requirements, could adversely affect our reputation, business, financial condition and results of operations.

We are subject to rapidly changing and increasingly stringent foreign and domestic laws and regulations relating to privacy and data protection. The restrictions imposed by these requirements or our failure to comply with them could harm our business.

We may collect, use or transfer personal information from clinical trials participants and other individuals located in the EU. Additionally, if any of our product candidates are approved, we may seek to commercialize those products in the EU. The collection and use of personal information, including health data, in the EU and EEA are governed by the General Data Protection Regulation ((EU) 2016/679), or GDPR. Companies that violate the GDPR can face private litigation, prohibitions on data processing and fines of up to the greater of 20 million Euros or 4% of their worldwide annual revenue. The GDPR requires us to give detailed disclosures about how we collect, use and share personal information; contractually commit to data protection measures in our contracts with vendors; maintain adequate data security measures; notify regulators and affected individuals of certain data breaches; meet extensive privacy governance and documentation requirements; and honor individuals' data protection rights, including their rights to access, correct and delete their personal information.

European data protection laws, including the GDPR, generally restrict the transfer of personal information from Europe, including the European Economic Area, United Kingdom and Switzerland, to the United States and most other countries unless the receiving country offers comparable data protection laws. Decisions by the Court of Justice of the European Union, or CJEU, indicate that the United States does not offer adequate data protection that is comparable to the GDPR; however, one of the primary safeguards allowing United States companies to continue to import personal information from the EU has been the European Commission's Standard Contractual Clauses, or SCCs. SCCs are standard contractual obligations that may be entered between a party exporting personal information from the EU and a party receiving the personal information in a third country. The CJEU adopted a decision in July 2020 validating that the SCCs can lawfully be used for personal information transfers from the EU to the United States, provided that the party exporting personal information from the EU conduct an analysis of the level of data protection available and take additional steps to guarantee adequate data protection, if needed. If adequate data protection cannot be guaranteed, EU citizens may complain to the data protection authorities, which may require data transfer under the contract to be suspended.

We continue to monitor changes in European data protection laws; however, uncertainty remains regarding any future regulations, interpretations or guidance that may be issued by the European authorities. At present, we primarily rely on individuals' explicit consent to transfer their personal information from Europe to the United States and other countries, but in certain cases we have relied or may rely on the SCCs. If we are unable to rely on explicit consent to transfer individuals' personal information from Europe, which can be revoked, or implement another valid compliance solution, we will face increased exposure to substantial fines under European data protection laws as well as injunctions against the export and processing of personal information from Europe. Our inability to import personal information from the European Economic Area, United Kingdom or Switzerland may also restrict our clinical trial activities in Europe; limit our ability to collaborate with CROs, service providers, contractors and other companies subject to European data protection laws; and require us to increase our data processing capabilities in Europe at significant expense.

In addition, there is currently a lack of clarity regarding the process for transferring personal information from the EU to the United Kingdom in compliance with the GDPR in light of Brexit. Pursuant to a post-Brexit trade deal between the United Kingdom and the EU, transfers of personal information from the European Economic Area to the United Kingdom are not considered restricted transfers under the GDPR for a period of up to six months from January 1, 2021. However, unless the EU Commission makes an adequacy finding with respect to the United Kingdom before the end of that period, transfers of European personal information to the United Kingdom will require an approved compliance mechanism to render such transfers lawful under the GDPR. As of February 2021, the European Commission has launched a process towards the adoption of an adequacy decision for transfers of personal data from the EU to the United Kingdom, having concluded that the United Kingdom ensures an essentially equivalent level of protection to that guaranteed under the GDPR; however, uncertainty remains regarding how data transfers to and from the United Kingdom ultimately will be regulated after Brexit. The UK has incorporated an amended version of the GDPR into UK law, which is independent from but aligned with the EU's GDPR. Non-compliance with the UK data protection law may result in monetary penalties of up to £17.5 million or 4% of worldwide revenue, whichever is higher. Additionally, other countries outside of Europe have enacted or are considering enacting similar cross-border data transfer restrictions and laws requiring local data residency, which could increase the cost and complexity of delivering our services and operating our business.

Privacy and data security laws in the United States are increasingly complex and changing rapidly. Just over a month after the GDPR took effect, the California legislature passed the California Consumer Privacy Act of 2018, or CCPA, which took effect on January 1, 2020. The CCPA gives California residents certain rights similar to the individual rights given under the GDPR, including the right to access and delete their personal information, opt-out of certain personal information sharing and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations. Since the enactment of the CCPA, new privacy and data security laws have been proposed in more than half of the states and in United States Congress, reflecting a trend toward more stringent privacy legislation in the United States. The CCPA itself will expand substantially as a result of California voters approving a November 2020 ballot measure that adopted the California Privacy Rights Act of 2020, which becomes fully effective on January 1, 2023, and will, among other things, create a new administrative agency to implement and enforce California's privacy laws. While certain clinical trials activities are exempt from the CCPA's requirements, other personal information that we handle may be subject to the CCPA, which may increase our compliance costs, exposure to regulatory enforcement action and other liabilities.

We use and generate materials that may expose us to material liability.

Our research programs involve the use of hazardous materials, chemicals and radioactive and biological materials. We are subject to foreign, federal, state and local environmental and health and safety laws and regulations governing, among other matters, the use, manufacture, handling, storage and disposal of hazardous materials and waste products. We may incur significant costs to comply with these current or future environmental and health and safety laws and regulations. In addition, we cannot completely eliminate the risk of contamination or injury from hazardous materials and may incur material liability as a result of such contamination or injury. In the event of an accident, an injured party may seek to hold us liable for any damages that result. Any liability could exceed the limits or fall outside the coverage of our workers' compensation, property and business interruption insurance and we may not be able to maintain insurance on acceptable terms, if at all. We currently carry no insurance specifically covering environmental claims.

Risks Related to Regulatory Approvals

The regulatory approval processes of the FDA and comparable foreign regulatory authorities are lengthy, time-consuming and inherently unpredictable. Our inability to obtain regulatory approval for our product candidates would substantially harm our business.

Currently, none of our product candidates has received regulatory approval and we do not expect our product candidates to be commercially available for several years, if at all. The time required to obtain approval from the FDA and comparable foreign regulatory authorities is unpredictable but typically takes many years following the commencement of preclinical studies and clinical trials and depends upon numerous factors, including the substantial discretion of the regulatory authorities. In addition, approval policies, regulations or the type and amount of preclinical and clinical data necessary to gain approval may change during the course of a product candidate's development and may vary among jurisdictions. It is possible that none of our existing or future product candidates will ever obtain regulatory approval.

Our product candidates could fail to receive regulatory approval from the FDA or a comparable foreign regulatory authority for many reasons, including:

- disagreement with the design or implementation of our clinical trials;
- failure to demonstrate that a product candidate is safe and effective for its proposed indication;
- failure of results of clinical trials to meet the level of statistical significance required for approval;
- failure to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- disagreement with our interpretation of data from preclinical studies or clinical trials;
- the insufficiency of data collected from clinical trials to support the submission and filing of a BLA or other submission or to obtain regulatory approval;

- failure to obtain approval of the manufacturing processes or facilities of third-party manufacturers with whom we contract for clinical and commercial supplies; or

- changes in the approval policies or regulations that render our preclinical and clinical data insufficient for approval.

The FDA or a comparable foreign regulatory authority may require more information, including additional preclinical or clinical data, to support approval, which may delay or prevent approval and commercialization, or we may decide to abandon the development program for other reasons. If we obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may grant approval contingent on the performance of costly post-marketing clinical trials or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate.

The FDA has a Fast Track program that is intended to expedite or facilitate the process for reviewing new drug products that meet certain criteria. Specifically, new drugs are eligible for Fast Track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition, and the FDA may grant accelerated approval based on a surrogate endpoint reasonably likely to predict clinical benefit. However, Fast Track designation does not guarantee, or in any way change the standards for, product approval. Accordingly, although aldafermin has received Fast Track designation from the FDA for NASH, we may not necessarily experience faster development timelines or achieve faster review or approval compared to conventional FDA procedures.

Many agents in development for NASH have, or are expected to, opt for an accelerated approval pathway and rely on surrogate endpoints for initial approval. If we seek accelerated approval for one of our product candidates, including aldafermin for NASH, based on a surrogate endpoint, the FDA may not accept such endpoint, may require additional studies or analysis or may not approve our product candidate on an accelerated basis, or at all. For example, in June 2020, Intercept Pharmaceuticals, Inc., or Intercept, announced that it had received a complete response letter regarding its New Drug Application for obeticholic acid for the treatment of NASH, in which the FDA indicated that it had determined that the predicted benefit of obeticholic acid based on a surrogate histopathologic endpoint was uncertain and did not sufficiently outweigh the potential risks to support accelerated approval for the treatment of patients with liver fibrosis due to NASH. The FDA recommended that Intercept submit additional post-interim analysis efficacy and safety data from its ongoing Phase 3 study in support of potential accelerated approval and that the long-term outcomes phase of the study should continue.

Our failure to obtain regulatory approval in international jurisdictions would prevent us from marketing our product candidates outside the United States.

If we or our collaborators succeed in developing any products, we intend to market them in the EU and other foreign jurisdictions in addition to the United States. In order to market and sell our products in other jurisdictions, we must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, we must secure product reimbursement approvals before regulatory authorities will approve the product for sale in that country. Obtaining 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. Further, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries and regulatory approval in one country does not ensure approval in any other country, while a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory approval process in others. If we fail to obtain approval of any of our product candidates by regulatory authorities in another country, we will be unable to commercialize our product in that country, and the commercial prospects of that product candidate and our business prospects could decline.

Even if our product candidates receive regulatory approval, they may still face future development and regulatory difficulties.

Even if we obtain regulatory approval for a product candidate, it would be subject to ongoing requirements by the FDA and comparable foreign regulatory authorities governing the manufacture, quality control, further development, labeling, packaging, storage, distribution, safety surveillance, import, export, advertising, promotion, recordkeeping and reporting of safety and other post-market information. The FDA and comparable foreign regulatory authorities will continue to closely monitor the safety profile of any product even after approval. If the FDA or comparable foreign regulatory authorities become aware of new safety information after approval of any of our product candidates, they may require labeling changes or establishment of a Risk Evaluation and Mitigation Strategy or similar strategy, impose significant restrictions on a product's indicated uses or marketing or impose ongoing requirements for potentially costly post-approval studies or post-market surveillance.

In addition, manufacturers of drug substance and drug products and their facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP regulations. If we or a regulatory agency discover previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory agency may impose restrictions on that product, the manufacturing facility or us, including requiring recall or withdrawal of the product from the market or suspension of manufacturing. If we, our product candidates or the manufacturing facilities for our product candidates fail to comply with applicable regulatory requirements, or undesirable side effects caused by such products are identified, a regulatory agency may:

- issue safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings about such product;
- mandate modifications to promotional materials or require us to provide corrective information to healthcare practitioners;
- require that we conduct post-marketing studies;
- require us to enter into a consent decree, which can include imposition of various fines, reimbursements for inspection costs, required due dates for specific actions and penalties for noncompliance;
- seek an injunction or impose civil or criminal penalties or monetary fines;
- suspend marketing of, withdraw regulatory approval of or initiate a recall of such product;
- suspend any ongoing clinical trials;
- refuse to approve pending applications or supplements to applications filed by us;
- suspend or impose restrictions on operations, including costly new manufacturing requirements; or
- seize or detain products or refuse to permit the import or export of products.

The occurrence of any event or penalty described above may inhibit our ability to commercialize our products and generate revenue.

Advertising and promotion of any product candidate that obtains approval in the United States will be heavily scrutinized by the FDA, Department of Justice, HHS, Office of Inspector General, state attorneys general, members of Congress and the public. Violations, including promotion of our products for unapproved (or off-label) uses, are subject to enforcement letters, inquiries and investigations and civil and criminal sanctions by the government. Additionally, comparable foreign regulatory authorities will heavily scrutinize advertising and promotion of any product candidate that obtains approval outside of the United States.

In the United States, engaging in the impermissible promotion of our products for off-label uses can subject us to false claims litigation under federal and state statutes, which can lead to civil and criminal penalties and fines and agreements that materially restrict the manner in which a company promotes or distributes drug products. These false claims statutes include the federal FCA, which allows any individual to bring a lawsuit against a pharmaceutical company on behalf of the federal government alleging submission of false or fraudulent claims, or causing to present such false or fraudulent claims, for payment by a federal program such as Medicare or Medicaid. If the government prevails in the lawsuit, the individual will share in any fines or settlement funds. Since 2004, these FCA lawsuits against pharmaceutical companies have increased significantly in volume and

breadth, leading to several substantial civil and criminal settlements regarding certain sales practices promoting off-label drug uses involving fines in excess of $1 billion. This growth in litigation has increased the risk that a pharmaceutical company will have to defend a false claim action, pay settlement fines or restitution, agree to comply with burdensome reporting and compliance obligations and be excluded from Medicare, Medicaid and other federal and state healthcare programs. If we do not lawfully promote our approved products, we may become subject to such litigation and, if we do not successfully defend against such actions, those actions may have a material adverse effect on our business, financial condition and results of operations.

The FDA's policies may change, and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained, which would adversely affect our business, prospects and ability to achieve or sustain profitability.

Even if we are able to obtain regulatory approvals for any of our product candidates, if they exhibit harmful side effects after approval, our regulatory approvals could be revoked or otherwise negatively impacted.

Even if we receive regulatory approval for aldafermin or any of our other product candidates, we will have tested them in only a small number of patients during our clinical trials. If our applications for marketing are approved and more patients begin to use our product, new risks and side effects associated with our products may be discovered. As a result, regulatory authorities may revoke their approvals. If aldafermin is approved by the FDA based on a surrogate endpoint pursuant to accelerated approval regulations (Subpart E regulations), we will be required to conduct additional clinical trials establishing clinical benefit on the ultimate outcome of NASH. Additionally, we may be required to conduct additional clinical trials, make changes in labeling of our product, reformulate our product or make changes and obtain new approvals for our and our suppliers' manufacturing facilities for aldafermin and our other product candidates. We might have to withdraw or recall our products from the marketplace. We may also experience a significant drop in the potential sales of our product if and when regulatory approvals for such product are obtained, experience harm to our reputation in the marketplace or become subject to lawsuits, including class actions. Any of these results could decrease or prevent any sales of our approved product or substantially increase the costs and expenses of commercializing and marketing our product.

Risks Related to Our Intellectual Property

Our success depends in significant part upon our ability to obtain and maintain intellectual property protection for our products and technologies.

Our success depends in significant part on our ability and the ability of our current or future licensors, licensees or collaborators to establish and maintain adequate intellectual property covering the product candidates that we plan to develop. In addition to taking other steps designed to protect our intellectual property, we have applied for, and intend to continue applying for, patents with claims covering our technologies, processes and product candidates when and where we deem it appropriate to do so. However, the patent prosecution process is expensive and time-consuming, and we and our current or future licensors, licensees or collaborators may not be able to prepare, file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we or our current or future licensors, licensees or collaborators will fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection for them. Pending and future patent applications filed by us or our current or future licensors', licensees' or collaborators' may not result in patents being issued that protect our technology or product candidates, or products resulting therefrom, in whole or in part, or that effectively prevent others from commercializing competitive technologies and products.

We have filed numerous patent applications both in the United States and in certain foreign jurisdictions to obtain patent rights to our inventions, with claims directed to compositions-of-matter, methods of use, formulations, combination therapy and other technologies relating to our product candidates. There can be no assurance that any of these patent applications will issue as patents or, for those applications that do mature into patents, whether the claims of the patents will exclude others from making, using or selling our product or product candidates, or products or product candidates that are substantially similar to ours. In countries where we have

not and do not seek patent protection, third parties may be able to manufacture and sell products that are substantially similar or identical to our products or product candidates without our permission, and we may not be able to stop them from doing so.

Similar to other biotechnology companies, our patent position is generally highly uncertain and involves complex legal and factual questions. In this regard, we cannot be certain that we or our current or future licensors, licensees or collaborators were the first to make an invention, or the first inventors to file a patent application claiming an invention in our owned or licensed patents or pending patent applications. In addition, even if patents are issued, given the amount of time required for the development, testing and regulatory review of our product candidates, any patents protecting such candidates might expire before or shortly after the resulting products are commercialized. Moreover, the laws and regulations governing patents could change in unpredictable ways that could weaken the ability of us and our current or future licensors, licensees or collaborators to obtain new patents or to enforce existing patents and patents we may obtain in the future. In any event, the issuance, scope, validity, enforceability and commercial value of our patent rights and those of our current or future licensors, licensees or collaborators are highly uncertain and may not effectively prevent others from commercializing competitive technologies and products.

In some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain or enforce the patents, covering technology that we license from or license to third parties and may be reliant on our current or future licensors, licensees or collaborators to perform these activities, which means that these patent applications may not be prosecuted, and these patents may not be enforced, in a manner consistent with the best interests of our business. If our current or future licensors, licensees or collaborators fail to establish, maintain, protect or enforce such patents and other intellectual property rights, such rights may be reduced or eliminated. If our current or future licensors, licensees or collaborators are not fully cooperative or disagree with us as to the prosecution, maintenance or enforcement of any patent rights, such patent rights could be compromised.

In addition, the legal protection afforded to inventors and owners of intellectual property in countries outside of the United States may not be as broad or effective as that in the United States and we may be unable to acquire and enforce intellectual property rights outside the United States to the same extent as in the United States, if at all. Accordingly, our efforts, and those of our licensors, licensees or collaborators, to enforce intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we own or license.

We do not currently own or have a license to any issued patents that cover our NGM621 product candidate, although it is disclosed and claimed in our pending U.S. non-provisional and/or national stage applications in particular foreign countries. Likewise, we do not currently own or have a license to any issued patents that cover our NGM707 and NGM438 product candidates, although these product candidates are disclosed and claimed in our pending U.S. provisional applications. The patent landscape surrounding all of our product candidates is crowded, and there can be no assurance that we will be able to secure patent protection that would adequately cover such product candidates, nor can there be any assurance that we would obtain sufficiently broad claims to be able to prevent others from selling competing products.

Any changes we make to our product candidates to cause them to have what we view as more advantageous properties may not be covered by our existing patents and patent applications, and we may be required to file new patent applications and/or seek other forms of protection for any such altered product candidates. The patent landscape surrounding the technology underlying our product candidates is crowded, and there can be no assurance that we would be able to secure patent protection that would adequately cover an alternative to our aldafermin molecule, including half-life extending formulation enhancements or the half-life extended variants of FGF19 that we are developing, NGM621, NGM707 and NGM438 or any of our other product candidates.

We may be unable to obtain intellectual property rights or technologies necessary to develop and commercialize our product candidates.

Several third parties are actively researching and seeking and obtaining patent protection in the liver and metabolic diseases, retinal diseases and cancer fields, and there are issued third-party patents and published third-party patent applications in these fields. The patent landscape around our product candidates is complex, and we are aware of several third-party patents and patent applications containing claims directed to

compositions-of-matter, methods of use and related subject matter, some of which pertain, at least in part, to subject matter that might be relevant to our product candidates. However, we may not be aware of all third-party intellectual property rights potentially relating to our product candidates and technologies.

Depending on what patent claims ultimately issue and how courts construe the issued patent claims, as well as the ultimate formulation and method of use of our product candidates, we may need to obtain a license to practice the technology claimed in such patents. There can be no assurance that such licenses will be available on commercially reasonable terms, or at all. If we are unable to successfully obtain rights to required third-party intellectual property rights or maintain the existing rights to third-party intellectual property rights we have, we might be unable to develop and commercialize one or more of our product candidates, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

We could lose the ability to continue the development and commercialization of our products or product candidates if we breach any license agreement related to those products or product candidates.

Our commercial success depends upon our ability, and the ability of our current and future licensors, licensees and collaborators, to develop, manufacture, market and sell our products and product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. A third party may hold intellectual property rights, including patent rights that are important or necessary to the development of our products. As a result, we are a party to a number of technology and patent licenses that are important to our business and we expect to enter into additional licenses in the future. If we fail to comply with the obligations under these agreements, including payment and diligence obligations, our licensors may have the right to terminate these agreements. In the event of a termination of these agreements, we may not be able to develop, manufacture, market or sell any product that is covered by these agreements or to engage in any other activities necessary to our business that require the freedom-to-operate afforded by the agreements, or we may face other penalties under the agreements. For example, we are party to license agreements with multiple vendors, including our licenses with Horizon and Lonza, under which we license cell lines and other technology used to produce multiple product candidates, including some that are currently subject to our collaboration with Merck. We require prior consent from some of these vendors to grant sub-licenses under these agreements. Therefore, these vendors may be able to prevent us from granting sub-licenses to third parties, which could affect our ability or Merck's ability to use certain desired manufacturers in order to manufacture our product candidates. In the event of a termination of our license agreements, our ability or Merck's ability to manufacture or develop any product candidates covered by these agreements may be limited or halted unless we can develop or obtain the rights to technology necessary to produce these product candidates.

Any of the foregoing could materially adversely affect the value of the product or product candidate being developed under any such agreement. Termination of these agreements or reduction or elimination of our rights under these agreements may result in our having to negotiate new or amended agreements, which may not be available to us on equally favorable terms, or at all, or cause us to lose our rights under these agreements, including our rights to intellectual property or technology important to our development programs.

We may become involved in lawsuits or other proceedings to protect or enforce our intellectual property, which could be expensive, time-consuming and unsuccessful and have a material adverse effect on the success of our business.

Third parties may infringe patents or misappropriate or otherwise violate intellectual property rights owned or controlled by us or our current or future licensors, licensees or collaborators. In the future, it may be necessary to initiate legal proceedings to enforce or defend these intellectual property rights, to protect trade secrets or to determine the validity or scope of intellectual property rights that are owned or controlled by us or our current or future licensors, licensees or collaborators. Litigation could result in substantial costs and diversion of management resources, which could harm our business and financial results.

If we or our current or future licensors, licensees or collaborators initiated legal proceedings against a third party to enforce a patent covering a product candidate, the defendant could counterclaim that such patent is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. In an infringement or

declaratory judgment proceeding, a court may decide that a patent owned by or licensed to us or our current or future licensors, licensees or collaborators is invalid or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that the patent does not cover the technology in question. An adverse result in any litigation proceeding could put one or more of the patents at risk of being invalidated, narrowed, held unenforceable or interpreted in such a manner that would not preclude third parties from entering the market with competing products.

Third parties may initiate legal proceedings against us or our current or future licensors, licensees or collaborators to challenge the validity or scope of intellectual property rights we own or control. For example, generic or biosimilar drug manufacturers or other competitors or third parties may challenge the scope, validity or enforceability of patents owned or controlled by us or our current or future licensors, licensees or collaborators. These proceedings can be expensive, lengthy and time-consuming, and many of our adversaries may have the ability to dedicate substantially greater resources to prosecuting these legal actions than us. Accordingly, despite our efforts, we or our current or future licensors, licensees or collaborators may not be able to prevent third parties from infringing upon or misappropriating intellectual property rights we own, control or have rights to, particularly in countries where the laws may not protect those rights as fully as in the United States.

There is a risk that some of our confidential information could be compromised by disclosure during litigation because of the substantial amount of discovery required. Additionally, many foreign jurisdictions have rules of discovery that are different than those in the United States and that may make defending or enforcing our patents extremely difficult. There also 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 material adverse effect on the price of shares of our common stock.

Third-party pre-issuance submission of prior art to the USPTO, opposition, derivation, revocation, reexamination, inter partes review or interference proceedings, or other pre-issuance or post-grant proceedings, as well as other patent office proceedings or litigation in the United States or other jurisdictions brought by third parties against patents or patent applications owned or controlled by us or our current or future licensors, licensees or collaborators, may be necessary to determine the inventorship, priority, patentability or validity of these patents or patent applications. An unfavorable outcome could leave our technology or product candidates without patent protection and allow third parties to commercialize our technology or product candidates without payment to us. Additionally, potential licensees or collaborators could be dissuaded from collaborating with us to license, develop or commercialize current or future product candidates if the breadth or strength of protection provided by our patents and patent applications is threatened. Even if we successfully defend such litigation or proceeding, we may incur substantial costs and it may distract our management and other employees.

Third parties may initiate legal proceedings against us alleging that we infringe their intellectual property rights or we may initiate legal proceedings against third parties to challenge the validity or scope of the third-party intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Third parties may initiate legal proceedings against us or our current or future licensors, licensees or collaborators alleging that we infringe their intellectual property rights. Alternatively, we may initiate legal proceedings to challenge the validity or scope of intellectual property rights controlled by third parties, including in oppositions, interferences, revocations, reexaminations, inter partes review or derivation proceedings before the USPTO or its counterparts in other jurisdictions. In this regard, we are aware of several third-party patents and patent applications containing claims directed to compositions-of-matter, methods of use and related subject matter, some of which pertain, at least in part, to subject matter that might be relevant to our product candidates. These proceedings can be expensive, lengthy and time-consuming, and many of our adversaries may have the ability to dedicate substantially greater resources to prosecuting these legal actions than us.

In addition, we may be subject to claims that we or our employees have used or disclosed confidential information or intellectual property, including trade secrets or other proprietary information, of any such employee's former employer, or that third parties have an interest in our patents as an inventor or co-inventor. Likewise, we and our current or future licensors, licensees or collaborators may be subject to claims that former employees, collaborators or other third parties have an interest in our owned or in-licensed patents, trade secrets, or other intellectual property as an inventor or co-inventor. Litigation may be necessary to defend against these claims.

Even if we believe third-party intellectual property claims are without merit, there is no assurance that a court would find in our favor on questions of infringement, validity, enforceability or priority. In order to successfully challenge the validity of any such U.S. patent in federal court, we would need to overcome a presumption of validity in favor of the granted third party patent. This is a high burden, requiring us to present clear and convincing evidence as to the invalidity of any such U.S. patent claim.

An unfavorable outcome in any such proceeding could require us and our current or future licensors, licensees or collaborators to cease using the related technology or developing or commercializing the product or product candidate, or to attempt to license rights to it from the prevailing party, which may not be available on commercially reasonable terms, or at all. Additionally, we could be found liable for monetary damages, including treble damages and attorneys' fees, if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business.

Risks Related to Ownership of Our Common Stock

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

The market price for our common stock has fluctuated significantly from time to time, for example, varying between a high of $32.05 on December 30, 2020 and a low of $8.81 on October 7, 2019. The trading price of our common stock has been and may continue to be highly volatile and subject to wide fluctuations in response to various factors, some of which we cannot control. In addition to the factors discussed in this "Risk Factors" section, these factors include:

- developments associated with our collaboration with Merck, including our failure to reach agreement with Merck on the terms of a modified collaboration, Merck's decision to not exercise its remaining unilateral option to extend the research phase of the collaboration, investor perceptions as to the terms of a modified Collaboration Agreement, if any, or any termination of the collaboration;
- the success of competitive products or technologies, including disclosure of interim data by our competitors;
- regulatory actions with respect to our product candidates or our competitors' product candidates or products;
- results of clinical trials of our product candidates or those of our competitors;
- timeline delays in our clinical trials, including delays resulting from the evolving effects of the global COVID-19 pandemic or otherwise;
- actual or anticipated changes in our growth rate relative to our competitors;
- announcements by us or our competitors or collaborators of significant acquisitions, strategic collaborations, joint ventures, collaborations or capital commitments;
- regulatory, legal or payor developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- the results of our efforts to in-license or acquire additional product candidates or products;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;

- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- share price and volume fluctuations attributable to inconsistent trading volume levels of our shares;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders or our other stockholders;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors; and
- general economic, industry and market conditions.

In addition, the stock market in general, and The Nasdaq Global Select Market and biotechnology companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies, including in connection with the ongoing COVID-19 pandemic, which has resulted in decreased stock prices for many companies notwithstanding the lack of a fundamental change in their underlying business models or prospects. Broad market and industry factors, including worsening economic conditions and other adverse effects or developments relating to the evolving effects of the COVID-19 pandemic, may negatively affect the market price of our common stock, regardless of our actual operating performance. The realization of any of the above risks or any of a broad range of other risks, including those described in this “Risk Factors” section, could have a dramatic and material adverse impact on the market price of our common stock.

Because of potential volatility in our trading price and trading volume, we may incur significant costs from class action securities litigation.

Holders of stock in companies that have a volatile stock price frequently bring securities class action litigation against the company that issued the stock. We may be the target of this type of litigation in the future. If any of our stockholders were to bring a lawsuit of this type against us, even if the lawsuit is without merit, we could incur substantial costs defending the lawsuit and the time and attention of our management could be diverted from other business concerns, either of which could seriously harm our business. Refer also to the risk factor entitled “Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall.”

An active trading market for our common stock may not be sustained.

Our common stock is currently listed on The Nasdaq Global Select Market under the symbol “NGM” and trades on that market. We cannot ensure that an active trading market for our common stock will be sustained. Accordingly, we cannot ensure the liquidity of any trading market, your ability to sell your shares of our common stock when desired or the prices that you may obtain for your shares.

Our principal stockholders, including entities affiliated with The Column Group, Merck and management, own a substantial percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

Our executive officers, directors, significant stockholders, including entities affiliated with The Column Group and Merck, and their respective affiliates beneficially own a substantial amount of our voting stock. These stockholders may be able to determine all matters requiring stockholder approval. For example, these stockholders may be able to control elections of directors, amendments of our organizational documents or approval of any merger, sale of assets or other major corporate transaction. The interests of this group of stockholders may not always coincide with your interests or the interests of other stockholders. In addition, if any of our significant stockholders decide to sell a meaningful amount of their ownership position and there is not sufficient demand in the market for such stocks, our stock price could fall.

We are an "emerging growth company" as defined in the JOBS Act and will be able to avail ourselves of reduced disclosure requirements applicable to emerging growth companies, which could make our common stock less attractive to investors and adversely affect the market price of our common stock.

For so long as we remain an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended, the JOBS Act, we may take advantage of certain exemptions from various requirements applicable to public companies that are not "emerging growth companies" including:

- the provisions of Section 404(b) of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, requiring that our independent registered public accounting firm provide an attestation report on the effectiveness of our internal control over financial reporting;

- the "say on pay" provisions (requiring a non-binding stockholder vote to approve compensation of certain executive officers) and the "say on golden parachute" provisions (requiring a non-binding stockholder vote to approve golden parachute arrangements for certain executive officers in connection with mergers and certain other business combinations) of the Dodd-Frank Wall Street Reform and Protection Act, or the Dodd-Frank Act, and some of the disclosure requirements of the Dodd-Frank Act relating to compensation of our chief executive officer; and

- the requirement to provide detailed compensation discussion and analysis in proxy statements and reports filed under the Exchange Act, and instead provide a reduced level of disclosure concerning executive compensation.

Because our independent registered public accounting firm is not required to provide an attestation report on the effectiveness of our internal control over financial reporting so long as we qualify as an "emerging growth company," the risk that material weaknesses or significant deficiencies in our internal control over financial reporting go undetected may be increased. Likewise, our election not to provide certain information, including certain financial information and certain information regarding compensation of our executive officers, that we would otherwise have been required to provide in filings we make with the SEC, may make it more difficult for investors and securities analysts to evaluate our company.

We may take advantage of these reporting exemptions until we are no longer an "emerging growth company", which in certain circumstances could be for up to five years. We will cease to be an "emerging growth company" upon the earliest of: (1) December 31, 2024; (2) the last day of the first fiscal year in which our annual gross revenue is $1.07 billion or more; (3) the date on which we have, during the previous rolling three-year period, issued more than $1 billion in non-convertible debt securities; and (4) the date on which we are deemed to be a "large accelerated filer" as defined in the Exchange Act.

With respect to the JOBS Act, we are also taking advantage of some, but not all, of the reduced regulatory and reporting requirements that are available to us so long as we qualify as an "emerging growth company." For example, we are not subject to the same new or revised accounting standards as other public companies that are not "emerging growth companies." As a result, changes in U.S. generally accepted accounting principles or their interpretation, the adoption of new guidance or the application of existing guidance to changes in our business could significantly affect our financial position and results of operations.

We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions and reduced requirements. 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 and may decline. In addition, if we lose our "emerging growth company" status sooner than anticipated, we may incur additional costs to comply with rules and regulations required for public companies, which may impact our financial position and results of operations.

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

For the trading days during the three months ended December 31, 2020, the average daily trading volume for our common stock on The Nasdaq Global Select Market was only 175,778 shares. As a result, sales of a substantial number of shares of our common stock in the public market, including pursuant to the Sales Agreement or the perception in the market that we or the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. In addition, as a result of the low trading volume of

our common stock, the trading of relatively small quantities of shares by our stockholders could disproportionately influence the market price of our common stock in either direction. The price for our shares could, for example, decline significantly in the event that a large number of shares of our common stock are sold on the market without commensurate demand, as compared to an issuer with a higher trading volume that could better absorb those sales without an adverse impact on its stock price. Moreover, certain holders of our common stock have rights, subject to certain conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders.

We 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. Any return to stockholders will therefore be limited to the appreciation of their stock, if any.

Some provisions of our charter documents, Delaware law and our agreement with Merck may have anti-takeover effects or could otherwise discourage an acquisition of us by others, even if an acquisition would benefit our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws, as well as provisions of Delaware law, could make it more difficult for a third party to acquire us or increase the cost of acquiring us, even if doing so would benefit our stockholders, or to remove our current management. 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;
- authorizing the issuance of “blank check” preferred stock, the terms of which we may establish and shares of which we may issue without stockholder approval;
- prohibiting cumulative voting in the election of directors, which would otherwise allow for less than a majority of stockholders to elect director candidates;
- prohibiting stockholder action by written consent, thereby requiring all stockholder actions to be taken at a meeting of our stockholders;
- eliminating the ability of stockholders to call a special meeting of stockholders; and
- establishing advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted upon at stockholder meetings.

These provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, who are responsible for appointing the members of our management. Because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, or DGCL, which may discourage, delay or prevent someone from acquiring us or merging with us whether or not it is desired by or beneficial to our stockholders. In addition, Section 203 of the DGCL prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder, which is generally a person that together with its affiliates owns, or within the last three years has owned, 15% of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner.

Certain provisions in our agreement with Merck may also deter a change of control. For example, under the current terms of our agreement with Merck, a change of control gives Merck the right to terminate the research phase of the collaboration as well as additional rights if our acquirer is a qualifying large pharmaceutical company or has a research, development or commercialization program that competes with a program licensed by Merck.

Any provision of our amended and restated certificate of incorporation, amended and restated bylaws, Delaware law or our agreement with Merck that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware and the federal district courts of the United States will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for the following types of actions or proceedings under Delaware statutory or common law: any derivative action or proceeding brought on our behalf; any action asserting a breach of a fiduciary duty; any action asserting a claim against us arising pursuant to the DGCL, our amended and restated certificate of incorporation or our amended and restated bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction. Furthermore, Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all such Securities Act actions. Accordingly, both state and federal courts have jurisdiction to entertain such claims. To prevent having to litigate claims in multiple jurisdictions and the threat of inconsistent or contrary rulings by different courts, among other considerations, our amended and restated certificate of incorporation further provides that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. While the Delaware courts have determined that such choice of forum provisions are facially valid, a stockholder may nevertheless seek to bring a claim in a venue other than those designated in the exclusive forum provisions. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated certificate of incorporation. This may require significant additional costs associated with resolving such action in other jurisdictions and there can be no assurance that the provisions will be enforced by a court in those other jurisdictions.

These exclusive forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage lawsuits against us and our directors, officers and other employees. If a court were to find either exclusive-forum provision in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur further significant additional costs associated with resolving the dispute in other jurisdictions, all of which could seriously harm our business.

General Risk Factors

New tax laws or regulations, changes to existing tax laws or regulations or changes in their application to us or our customers may have a material adverse effect on our business, cash flows, financial condition or results of operations.

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, which could adversely affect our business and financial condition. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to us. For example, the 2017 Tax Act sanctioned many significant changes to the U.S. tax laws. Future guidance from the U.S. Internal Revenue Service, or IRS, and other tax authorities with respect to the 2017 Tax Act may affect us, and certain aspects of the 2017 Tax Act may be repealed or modified in future legislation. For example, the CARES Act modified certain provisions of the 2017 Tax Act. Changes in corporate tax rates, the realization of net deferred tax assets relating to our operations, the taxation of foreign earnings and the deductibility of expenses under the 2017 Tax Act or future reform legislation could have a material impact on the value of our deferred tax assets, could result in significant one-time charges and could increase our future U.S. tax expense.

Future changes in financial accounting standards or practices may cause adverse and unexpected revenue fluctuations and adversely affect our reported results of operations.

Future changes in financial accounting standards may cause adverse, unexpected revenue fluctuations and affect our reported financial position or results of operations. Financial accounting standards in the United States are constantly under review and new pronouncements and varying interpretations of pronouncements have occurred frequently in the past and are expected to occur again in the future. As a result, we may be required to make changes in our accounting policies. Those changes could affect our financial condition and results of operations or the way in which such financial condition and results of operations are reported. Compliance with new accounting standards may also result in additional expenses. As a result, we intend to invest all reasonably necessary resources to comply with evolving standards, and this investment may result in increased general and administrative expenses and a diversion of management time and attention from business activities to compliance activities.

We incur increased costs as a result of operating as a public company, and our management devotes substantial time to new compliance initiatives.

As a public company, we incur significant legal, accounting, insurance and other expenses that we did not incur as a private company, and these expenses may increase even more after we are no longer an “emerging growth company.” As a public company, we are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act and the Dodd-Frank Act, as well as rules adopted, and to be adopted, by the SEC and The Nasdaq Global Select Market. Our management and other personnel devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations increase our legal and financial compliance costs and may make some activities more time-consuming and costly. The increased costs will increase our net loss. For example, these rules and regulations make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to incur substantial costs to maintain sufficient coverage. We cannot predict or estimate the amount or timing of additional costs we may incur in the future to respond to these requirements. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

Specifically, in order to comply with the requirements of being a public company, we need to undertake various actions, including implementing new internal controls and procedures and hiring new accounting or internal audit staff. The Sarbanes-Oxley Act requires that we maintain effective disclosure controls and procedures and internal control over financial reporting. We are continuing to develop and refine our disclosure controls and other procedures that are designed to ensure that information required to be disclosed by us in the reports that we file with the SEC is recorded, processed, summarized and reported within the time periods specified in the SEC’s rules and forms, and that information required to be disclosed in reports under the Exchange Act is accumulated and communicated to our principal executive and financial officers. Any failure to develop or maintain effective controls could adversely affect the results of periodic management evaluations. In the event that we are not able to demonstrate compliance with the Sarbanes-Oxley Act, that our internal control over financial reporting is perceived as inadequate or that we are unable to produce timely or accurate financial statements, investors may lose confidence in our operating results and the price of our common stock could decline. In addition, if we are unable to continue to meet these requirements, we may not be able to remain listed on The Nasdaq Global Select Market.

Our disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

We designed our disclosure controls and procedures to reasonably assure that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls.

Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

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

Our stock price and trading volume is heavily influenced by the way analysts and investors interpret our clinical trial results, financial information and other disclosures. If securities or industry analysts do not publish research or reports about our business, delay publishing reports about our business or publish negative reports about our business, regardless of accuracy, our stock price and trading volume could decline.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

We lease and occupy approximately 122,000 square feet of laboratory and office space in South San Francisco, California. The lease is scheduled to expire in December 2023. We believe that our current spaces are adequate and suitable for our needs. We also believe we will be able to obtain additional space, as needed, on commercially reasonable terms.

Item 3. Legal Proceedings.

None.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

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

Market Information

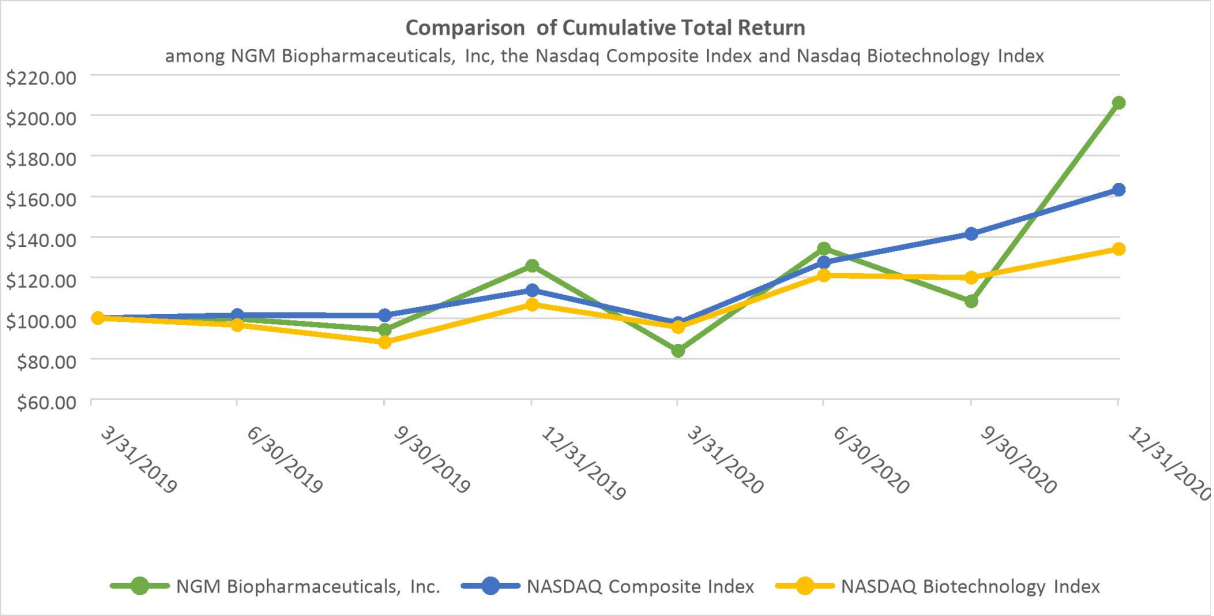
Our common stock has been listed on the Nasdaq Global Select Market under the symbol "NGM" since April 4, 2019. Prior to that date, there was no public trading market for our common stock.

Holders of Record

As of the close of business on March 10, 2021, there were 56 stockholders of record of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Performance Graph

The following stock performance graph compares the value of an investment in (i) our common stock, (ii) Nasdaq Composite Index and (iii) Nasdaq Biotechnology Index for the period from April 4, 2019 (the date our common stock commenced trading on the Nasdaq Global Select Market) through December 31, 2020. The figures represented below assume an investment of $100 in our common stock at the closing price on April 4, 2019 and in the Nasdaq Composite Index and Nasdaq Biotechnology Index on April 4, 2019 and the reinvestment of dividends into shares of common stock. However, no dividends have been declared on our common stock to date. The comparisons in the table are required by the Securities and Exchange Commission, or SEC, and are not intended to forecast or be indicative of possible future performance of our common stock.



	4/4/2019	12/31/2019	3/31/2020	6/30/2020	9/30/2020	12/31/2020
NGM Biopharmaceuticals, Inc.	$ 100.00	$ 125.78	$ 83.88	$ 134.29	$ 108.23	$ 206.09
NASDAQ Composite Index	100.00	113.70	97.57	127.46	141.51	163.31
NASDAQ Biotechnology Index	100.00	106.66	95.55	121.05	119.90	134.05

The information under "Performance Graph" is not deemed to be "soliciting material" or "filed" with the SEC or subject to Regulation 14A or 14C, or to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and is not to be incorporated by reference in any filing of NGM under the Securities Act of 1933, as amended, or the Securities Act, or the Exchange Act, whether made before or after the date of this Annual Report on Form 10-K and irrespective of any general incorporation language in those filings.

Recent Sales of Unregistered Securities

During the year ended December 31, 2020, we did not issue or sell any unregistered securities.

Issuer Purchases of Equity Securities

During the year ended December 31, 2020, we did not make any purchases of our own equity securities.

Use of Proceeds from Initial Public Offering of Common Stock

In April 2019, our Registration Statement on Form S-1 (No. 333-227608) was declared effective by the SEC for our initial public offering, or IPO, of common stock, and we sold an aggregate of 7,521,394 shares of common stock, including 854,727 shares sold pursuant to the underwriters' exercise of their option to purchase additional shares, at a public offering price of $16.00 per share. The aggregate net cash proceeds we received for shares sold in the IPO was $107.8 million, after deducting underwriting discounts, commissions and offering expenses. No payments for such expenses were made directly or indirectly to our officers or directors, to persons owning 10% or more of any class of our equity securities or to any of our affiliates. The sale and issuance of 6,666,667 shares in the IPO closed on April 8, 2019 and the sale of 854,727 additional shares pursuant to the underwriters' over-allotment option closed on May 7, 2019. Goldman Sachs & Co. LLC, Citigroup Global Markets Inc. and Cowen and Company, LLC acted as joint book-running managers for the offering. The proceeds from the IPO were used to fund ongoing operations, including the development of our product candidates and our clinical trials and research programs, and for working capital and general operating expenses. There has been no

material change in the planned use of proceeds as described in the prospectus for the IPO filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act on April 4, 2019. No payments were made from our IPO proceeds directly or indirectly to our officers or directors, to persons owning 10% or more of any class of our equity securities or to any of our affiliates, other than payments in the ordinary course of business to officers for salaries and to non-employee directors as compensation for Board or Board committee service.

Item 6. Selected Financial Data

We have elected to early adopt the amendment to Regulation S-K eliminating Item 301 of Regulation S-K and therefore are omitting disclosure under this Item 6.

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and related notes appearing elsewhere in this Annual Report. This discussion and analysis contains forward-looking statements that reflect our plans, estimates, expectations, assumptions and beliefs and involve risks and uncertainties. Our actual results and the timing of certain events could differ materially from those anticipated in these forward-looking statements as a result of several factors, including those discussed in the section titled "Risk Factors" included under Part I, Item 1A and elsewhere in this Annual Report on Form 10-K. See "Special Note Regarding Forward-Looking Statements" in this Annual Report on Form 10-K.

Overview of Our Business

We are a biopharmaceutical company focused on discovering and developing novel therapeutics based on scientific understanding of key biological pathways underlying liver and metabolic diseases, retinal diseases and cancer. These diseases represent a significant burden for patients and healthcare systems and, in some cases, are leading causes of morbidity and mortality. Our strategy is to leverage a combination of interrogating human biology and engineering powerful biologics to discover and develop promising product candidates and seek to move them rapidly into proof-of-concept studies and late-stage development, with the goal of delivering impactful first-in-class or best-in-class treatments to underserved patients suffering from grievous diseases. Since the commencement of our operations in 2008, we have generated a robust portfolio of product candidates ranging from early discovery to late-stage development. We aspire to operate one of the most productive research and development engines in the biopharmaceutical industry.

Pipeline Programs and Operations Updates

Our discovery engine supports our ability to advance multiple product candidates across our three key therapeutic areas. In 2020 and 2021 to date, we progressed the development of our leading product candidates, achieving important development milestones as described below:

- **Liver and metabolic diseases**.
    - **Aldafermin**. Aldafermin is an engineered analog of human hormone fibroblast growth factor 19, or FGF19, that is administered through a once-daily subcutaneous injection. Aldafermin is wholly-owned by us and is in Phase 2b development for the treatment of patients with non-alcoholic steatohepatitis, or NASH, with liver fibrosis stage 2, 3 or 4, or F2, F3 or F4. In 2020 and early 2021, we:
        - Presented positive liver histology and biomarker data from the final cohort, Cohort 4, in our adaptive Phase 2 clinical trial of aldafermin in patients with NASH in February 2020. Cohort 4 was a 24-week double-blind, randomized, placebo-controlled Phase 2 trial and the data from this cohort demonstrated statistically significant activity on the composite endpoint of both reversing fibrosis and resolving NASH. In the study, aldafermin continued to demonstrate a favorable tolerability profile. The results observed in Cohort 4 were consistent with data from the three previous cohorts.
        - Completed enrollment in the Phase 2b ALPINE 2/3 clinical trial of aldafermin in patients with NASH with F2 and F3 liver fibrosis in September 2020.
        - Initiated the Phase 2b ALPINE 4 clinical trial of aldafermin in patients with NASH with F4 liver fibrosis and well-compensated cirrhosis in February 2020.
        - ***Looking forward***: We expect to report topline results from the ALPINE 2/3 trial in the second quarter of 2021. In the ALPINE 4 trial, we are continuing enrollment, with a goal of enrolling approximately 160 patients across 70 sites in the United States, Europe, Hong Kong and Australia. We are leveraging the results of Cohort 4 of our Phase 2 clinical trial, as well as guidance from the U.S. Food and Drug Administration, or FDA, to inform early Phase 3 planning and design. We expect that the ALPINE 2/3 trial results will

provide further information to support our design of a pivotal clinical trial program to enable a potential biologics license application, or BLA, submission.

- **MK-3655** (formerly NGM313). MK-3655 is an agonistic antibody discovered by us that selectively activates fibroblast growth factor receptor 1c-beta-klotho, or FGFR1c/KLB, which regulates insulin sensitivity, blood glucose and liver fat and is administered every four weeks through a subcutaneous injection. MK-3655 is in Phase 2b development for the treatment of NASH and was optioned by Merck Sharp & Dohme Corp., or Merck, under our collaboration with Merck described below. In 2020, Merck:
  - Initiated a worldwide Phase 2b trial of MK-3655 in patients with NASH with F2 or F3 liver fibrosis in the fourth quarter of 2020 and is currently enrolling patients in that trial.

- **Retinal diseases**.
  - **NGM621**. NGM621 is a humanized Immunoglobulin 1, or IgG1, monoclonal antibody administered via intravitreal, or IVT, injection. NGM621 was engineered to potently inhibit the activity of complement C3 with the treatment goal of reducing disease progression in patients with geographic atrophy, or GA. Merck has a one-time option to license NGM621 upon completion of a proof-of-concept study in humans. In 2020 and early 2021, we:
    - Completed a Phase 1 clinical trial of NGM621 testing the safety and tolerability of single and multiple IVT injections in patients with GA and, at the American Academy of Ophthalmology 2020 Virtual meeting in November 2020, presented safety and pharmacokinetics, or PK, data from the Phase 1 trial demonstrating that NGM621 was well tolerated, with no patients experiencing serious adverse events, or SAEs, drug-related adverse events, or AEs, intraocular inflammation, endophthalmitis or choroidal neovascularization. No dose-related safety patterns or concerns were identified.
    - In July 2020, initiated the CATALINA Phase 2 clinical trial of NGM621 in patients with GA to evaluate NGM621's effects on disease progression when given every four weeks or every eight weeks. The CATALINA trial was designed to be a Phase 3-supportive or -enabling clinical trial.

- **Oncology**.
  - **NGM120**. NGM120, an antagonistic antibody that binds glial cell-derived neurotrophic factor receptor alpha-like, or GFRAL, and inhibits growth differentiation factor 15, or GDF15, signaling, for the potential treatment of cancer and cancer anorexia/cachexia syndrome, referred to as anti-cancer cachexia or CACS. We are currently conducting clinical trials to assess NGM120's effect on cancer-related cachexia and on cancer in patients with select advanced solid tumors and metastatic pancreatic cancer. Merck has a one-time option to license NGM120 upon completion of a proof-of-concept study in humans. In 2020 and early 2021, we:
    - Completed enrollment in two cohorts of a Phase 1a/1b dose-finding clinical trial of NGM120 in November 2020: a Phase 1a cohort evaluating NGM120 as a monotherapy in patients with select advanced solid tumors and a Phase 1b cohort evaluating NGM120 in combination with gemcitabine and Abraxane® (paclitaxel protein bound) in patients with metastatic pancreatic cancer. This trial is ongoing.
    - In January 2021, initiated a placebo-controlled expansion of the Phase 1b portion of the trial testing NGM120 in combination with gemcitabine and Abraxane as first-line treatment in patients with metastatic pancreatic cancer to assess NGM120's effect on both cancer and cancer-related cachexia, building upon our experiences in the Phase 1a/1b trial.
    - ***Looking forward***: We expect to report topline data from the Phase 1a/1b trial in the second half of 2021.
  - **NGM707**. NGM707 is a dual antagonist monoclonal antibody that inhibits Immunoglobulin-like transcript 2, or ILT2, and Immunoglobulin-like transcript 4, or ILT4. ILT2 and ILT4 are key myeloid and lymphoid checkpoints that may restrict anti-tumor immunity, enable tumors to evade

immune detection and contribute to T-cell checkpoint resistance. Merck has a one-time option to license NGM707 upon completion of a proof-of-concept study in humans. In 2020 and early 2021, we:

- Completed all preclinical studies of NGM707 to enable an investigational new drug application-, or IND-, submission.
- ***Looking forward***: We expect to commence a first-in-human Phase 1 clinical trial of NGM707 in patients with advanced solid tumors in mid-2021.

- **NGM438**. NGM438 is an antagonistic antibody that is designed to inhibit leukocyte-associated immunoglobulin-like receptor 1, or LAIR1, and promote immune detection and activation against advanced solid tumors. Merck has a one-time option to license NGM438 upon completion of a proof-of-concept study in humans. In 2020 and early 2021, we:
  - Advanced preclinical IND-enabling studies of NGM438 and began preparing an IND for a planned submission in the second half of 2021.
  - ***Looking forward***: We expect to commence a first-in-human Phase 1 clinical trial of NGM438 in patients with advanced solid tumors in the fourth quarter of 2021.

We have additional undisclosed programs that are in various stages of development ranging from functional validation to preclinical development.

The success of each of our product candidates may be affected by numerous factors, including preclinical data, clinical data, competition, manufacturing capability, sales capability, collaboration partners, regulatory matters, third-party payor matters and commercial viability. We do not have any products approved for sale and do not anticipate generating revenue from product sales for the foreseeable future, if ever.

Partnering has been and is expected to continue to be a key component of our strategy as we plan to continue to develop a broad portfolio of product candidates and, if approved, to commercialize the resulting products. Our existing research collaboration, product development and license agreement with Merck, or the Collaboration Agreement, which we entered into in 2015, has to date provided us with substantial financial support from Merck. The collaboration has also afforded us substantial freedom to pursue development efforts for our collaboration programs and product candidates. We are currently in discussions with Merck with respect to modifying certain terms of the collaboration, as described in more detail below. In addition, for any programs wholly-owned by us and not subject to the Merck collaboration, such as aldafermin, we may decide to pursue a strategic partner to progress, in whole or in part, the program or commercialize any resulting approved product.

In addition, all of our manufacturing activities are outsourced to third-party contract development and manufacturing organizations or third-party contract manufacturing organizations, which we refer to collectively as CMOs, who are generally single source suppliers of the drug product or drug substance they are manufacturing for us. We also utilize third-party contract research organizations, or CROs, to carry out many of our clinical development activities. We expect to be reliant on CMOs and CROs for these activities for the foreseeable future. Significant portions of our research and development resources are focused, and will continue to be focused, on activities required to prepare aldafermin for potential regulatory approval for the treatment of NASH, including manufacturing of clinical trial materials and preparation for potential Phase 3 testing. If our CROs fail to satisfy their contractual duties to us or meet expected deadlines or if our CMOs experience difficulties in scaling production or experience product loss due to contamination, equipment failure, improper installation or operation of equipment, vendor or operator error, turnover of qualified staff or improper storage conditions, our ongoing and planned aldafermin trials would be delayed, perhaps substantially, which could materially and adversely affect our business.

We seek to allocate our capital efficiently and strategically and fund our portfolio based on each program's scientific and other merits. Our discipline has been demonstrated by the suspension of development activities on multiple viable product candidates for portfolio management reasons in order to concentrate our resources on what we consider our most promising product candidates. For example, in 2020, we suspended development activities related to multiple metabolic disease product candidates in order to concentrate our resources on aldafermin and certain other product candidates subject to our Merck collaboration. Most recently, in December 2020, based on the overall clinical experience with both NGM386 (a once-daily GDF15 agonist product candidate we suspended development of earlier in 2020) and NGM395 (a long-acting GDF15 agonist product

candidate), we decided to suspend development of our GDF15 agonist program, including both NGM386 and NGM395, after we complete an ongoing Phase 1 clinical trial evaluating safety, tolerability and PK of NGM395 in obese but otherwise healthy adults. We remain interested in the potential applications of a GDF15 agonist, but we believe antagonizing the GDF15 receptor, GFRAL, with NGM120 in patients with cancer has a stronger near-term rationale for development. In mid-2020, we also suspended development of NGM217, an antibody binding an undisclosed target that is designed to restore pancreatic islet function and increase insulin production in patients with diabetes, after we completed a Phase 1 clinical trial of NGM217 assessing its safety, tolerability and PK in adults with autoimmune diabetes. This clinical trial demonstrated that NGM217 was well tolerated; however, we decided to suspend activities related to NGM217 to concentrate our resources on the development of other product candidates.

Merck Collaboration Update

The original research phase of the Collaboration Agreement with Merck was for five years. In March 2019, Merck exercised its option to extend the research phase of the collaboration through March 16, 2022. Under the terms of the collaboration, Merck was required to notify us no later than March 17, 2021 of its unilateral decision whether to exercise its option to extend the research phase of the collaboration for an additional two-year term through March 16, 2024. In March 2021, Merck initiated discussions with us with respect to elements of the ongoing collaboration that might be optimized to better address the evolving interests and priorities of both NGM and Merck during the remainder of the current research phase through March 16, 2022 and during any extension of the current research phase and any tail period after the end of the research phase. In this regard, the parties are negotiating in good faith certain modifications to the terms of the collaboration. Such modifications may include, among other things, focusing NGM's research and development under the collaboration on therapeutic areas of particular interest to Merck, while enabling NGM to conduct research and development outside of these therapeutic areas which would, if mutually agreed to, allow NGM to discover and develop product candidates on its own or with third parties in other areas of interest. In order to allow negotiations to proceed, the parties have agreed to extend the March 17, 2021 deadline for Merck to deliver its extension notification decision until June 30, 2021. While we cannot predict whether or when Merck will elect to extend the research phase of the collaboration or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms.

Financial Highlights

Since inception, we have funded our operations primarily through:

- fees received from collaboration partners, primarily Merck, which since inception through December 31, 2020 includes reimbursement of research and development expenses of $400.6 million, upfront cash licensing fees of $123.0 million, primarily from Merck, and a payment of $20.0 million from Merck to license MK-3655 and related compounds;
- proceeds from a private placement of convertible preferred stock prior to our initial public offering, or IPO, including approximately $106.0 million of our Series E convertible preferred stock purchased by Merck;
- net proceeds from our IPO in 2019 of approximately $107.8 million, together with proceeds from the concurrent private placement of shares of common stock to Merck of $65.9 million;
- net proceeds of $21.9 million from sales of 809,700 shares of our common stock at an average price of $27.94 per share in December 2020 under an Open Market Sale Agreement℠, or the Sales Agreement, we entered into with Jefferies LLC, or Jefferies, in June 2020; and

- net proceeds of approximately $134.7 million from the sale of 5,324,074 shares of our common stock in January 2021 upon completion of an underwritten public offering of our common stock, or the follow-on offering, which included the full exercise by the underwriters of their option to purchase additional shares.

At December 31, 2020, we had $295.2 million in cash, cash equivalents and short-term marketable securities, which does not include net proceeds of approximately $134.7 million from our follow-on offering in January 2021.

We have incurred net losses each year since our inception. Our consolidated net losses were $102.5 million, $42.8 million and $0.5 million for the years ended December 31, 2020, 2019 and 2018, respectively. As of December 31, 2020, we had an accumulated deficit of $298.6 million. Substantially all of our net losses have resulted from costs incurred in connection with our research and development, or R&D, programs and general and administrative costs associated with our operations. Our net losses may fluctuate significantly from quarter to quarter and year to year, depending on the timing of our clinical trials and our expenses on other R&D activities, and the amount of R&D funding we receive from collaboration partners, including Merck. For further discussion of our financial position and future sources of funding, see “Liquidity and Capital Resources” below.

COVID-19 Business Update

We are continuing to closely monitor the impact of the global COVID-19 pandemic on our business and have taken and continue to take proactive efforts designed to protect the health and safety of our patients, study investigators, clinical research staff and employees, while maintaining business continuity. Following guidance from federal, state and local authorities, we continue to operate with a primarily remote work model. Only individuals conducting essential in-person laboratory work and other essential business functions are working on site and only for work that cannot be conducted remotely. There have been relatively minor impacts on productivity overall, but future developments could more materially and adversely impact our productivity. In addition, in 2020, we experienced higher-than-normal employee turnover and an increased rate of hiring new employees. We cannot predict whether these trends will continue or be exacerbated, when we will be permitted to return to an office-based working model or whether we will be required to adopt a more restrictive work model.

For patients enrolled in our clinical trials, we continue to work closely with clinical trial investigators and site staff with the goal of continuing treatment in a manner designed to uphold trial integrity, while allowing some flexibility in the manner and timing of patient visits, and to observe government and institutional guidelines designed to safeguard the health and safety of patients, clinical trial investigators and site staff. We have experienced, from time to time, a slower pace of clinical trial site initiation and clinical trial enrollment than originally anticipated in certain of our clinical trials, including the ALPINE 4, CATALINA and NGM120 trials, and we have experienced a higher dropout rate than anticipated in our ALPINE 2/3 trial after we completed enrollment, due to factors such as the vulnerability of our studied patient populations, clinical trial site suspensions, reallocation of medical resources and the challenges of working remotely due to shelter-in-place and similar government orders, among other factors.

We have been proactively working to mitigate these and other effects of the COVID-19 pandemic by monitoring site initiations, patient enrollment and patient study adherence to provide support to patients and trial staff, often on a case-by-case and/or patient-by-patient basis. For example, we have implemented additional study policies and procedures designed to help protect trial participants from exposure to COVID-19 as a result of their trial participation, which include the use of telemedicine visits, remote monitoring of patients and clinical trial sites and other measures, as appropriate, designed to ensure that data from clinical trials that may be disrupted as result of the pandemic are collected pursuant to the study protocol and consistent with current Good Clinical Practices, with any material protocol deviation reviewed and approved by the clinical trial site Institutional Review Boards. Most of our clinical trial sites, both within and outside of the United States, continue to screen patients in our clinical trials, and new patients are being enrolled when appropriate. While the COVID-19 pandemic has not yet resulted in a significant impact to our disclosed clinical development timelines and we believe the higher-than-planned enrollment we achieved in our ALPINE 2/3 trial has mitigated the effects of the increased dropout rate, as the pandemic continues, there may be continuing negative impacts on our ability to initiate new clinical trial sites, maintain enrollment of existing patients and enroll new patients, which may result in increased clinical trial costs and negatively impact our timelines and our ability to obtain regulatory approvals of our product candidates in a timely fashion, if at all.

We also could see an adverse impact on our ability to report clinical trial results, or interact with regulators, institutional review boards and ethics committees or other important agencies due to limitations in regulatory authority employee resources or otherwise. Moreover, we rely on CROs and other third parties to assist us with clinical development activities, and we cannot guarantee that they will continue to perform their contractual duties in a timely and satisfactory manner as a result of the COVID-19 pandemic.

In addition, while we have not experienced any disruption to drug or related component supply for our ongoing clinical trials, we could experience disruptions to our supply chain and operations due to the continuing pandemic, and associated delays in the manufacturing and supply of drug substance and drug product for our clinical trials, which could adversely affect our ability to conduct ongoing and future clinical trials of our product candidates. For example, our aldafermin drug product CMO has advised us that it could be required under orders of the U.S. government to allocate manufacturing capacity to the manufacture or distribution of COVID-19 vaccines. If any of our CMOs become subject to acts or orders of U.S. or foreign government entities to allocate manufacturing capacity to the manufacture or distribution of COVID-19 vaccines or medical supplies needed to treat COVID-19 patients, this could also delay our clinical trials, perhaps substantially, particularly our ongoing and planned aldafermin trials, which could materially and adversely affect our business.

Finally, we cannot predict how the evolving effects of the COVID-19 pandemic may influence the future decisions of Merck to license any programs available to it under the Collaboration Agreement, to exercise its remaining option to extend the research phase of the collaboration beyond March 16, 2022 or to reach agreement with us on the terms of a modified collaboration, if any. For additional information about risks and uncertainties related to the COVID-19 pandemic that may impact our business, financial condition and results of operations, see the section titled “Risk Factors” in Part I, Item 1A of this Annual Report on Form 10-K.

Financial Operations Overview

Collaboration Revenue

Our revenue to date has been generated primarily from recognition of license fees and R&D service funding pursuant to our Collaboration Agreement with Merck. Merck is also a significant stockholder and, as such, collaboration revenue from Merck is referred to as related party revenue.

Merck Collaboration

In 2015, we entered into the Collaboration Agreement with Merck, covering the discovery, development and commercialization of novel therapies across a range of therapeutic areas, including a broad, multi-year drug discovery and early development program financially supported by Merck, but scientifically directed by us with input from Merck. Merck generally has a one-time right to exercise its option to an exclusive, worldwide license for any collaboration product candidate and related program when a human proof-of-concept trial is completed. In 2018, Merck exercised its option to license MK-3655, which is a potential treatment for NASH. Under the current terms of the Collaboration Agreement, for a program that Merck licenses, we retain an option, when a product candidate has advanced to Phase 3 clinical trials, to participate in up to 50% of the economic return from that product candidate if it becomes an approved medicine by agreeing to share up to 50% of the costs of future development. If we do not elect this option, we will instead receive milestone and royalty payments and we will not be required to share in development costs.

The aldafermin program is not included in the Collaboration Agreement and it remains wholly-owned and controlled by us.

The term of the current research phase of the collaboration and a general description of the funding we have received and may in the future receive under the collaboration for research and development expenses is included in “Our Collaboration with Merck” in Part I, Item 1A of this Annual Report on Form 10-K and “Overview of Our Business -- Merck Collaboration Update” above. Since inception through December 31, 2020, Merck had paid us $495.8 million under the Collaboration Agreement. Due to the nature of our agreement with Merck and the timing of related revenue recognition, our revenue has fluctuated from period to period in the past and we expect that it will continue to fluctuate in future periods.

We use the cost-based input method in accordance with Accounting Standards Codification 606, or ASC 606, to calculate the corresponding amount of revenue to recognize at each reporting period. In applying the cost-based input measure of revenue recognition, we measure actual costs incurred relative to budgeted costs to fulfill

our performance obligation. We apply considerable judgment when we re-evaluate the estimate of expected costs to satisfy the performance obligation each reporting period and make adjustments for any significant changes. A significant change in the estimate of expected costs for the remainder of the current two-year extension period could have a material impact on revenue recognized (including the possible reversal of previously recognized revenue) at each reporting period.

The sources of our collaboration revenue were as follows (in thousands):

	Year Ended December 31,		
	2020	2019[1]	2018
Related party revenue:			
Collaboration service revenue	$ 87,368	$ 103,544	$ 69,865
License revenue	—	—	20,000
Recognition of upfront fee	—	—	18,800
Totals	$ 87,368	$ 103,544	$ 108,665

(1) We adopted ASU 2014-09, Revenue from Contracts with Customers (Topic 606), and subsequent amendments, under the modified retrospective approach on January 1, 2019. Refer to Note 2 to our consolidated financial statements for more details.

Research and Development Expenses

R&D efforts include drug discovery research activities and development activities relating to our product candidates, such as manufacturing drug substance, drug product and other clinical trial materials, conducting preclinical studies and clinical trials and providing support for these operations. Our R&D expenses consist of both internal and external costs. Our internal costs include employee, consultant, facility and other R&D operating expenses. Our external costs include fees paid to CROs and other service providers in connection with our clinical trials and preclinical studies, third-party license fees and CMO costs related to manufacturing drug substance, drug product and other clinical trial materials.

Our R&D expenses related to the development of aldafermin, MK-3655, NGM621, NGM120, NGM707 and NGM438 (and prior to suspending these programs, NGM386, NGM395 and NGM217) consist primarily of:

- fees paid to our CROs in connection with our clinical trials and other related clinical trial fees, when applicable;
- costs related to acquiring and manufacturing drug substance, drug product and clinical trial materials, including continued testing, such as process validation and stability, of drug substance and drug product;
- costs related to toxicology testing and other research and preclinical related studies;
- salaries and related overhead expenses, which include stock-based compensation and benefits, for personnel in R&D functions;
- fees paid to consultants for R&D activities;
- R&D operating expenses, including facility costs and depreciation expenses; and
- costs related to compliance with regulatory requirements.

Our clinical development efforts are spread across multiple programs, most of which are subject to the Merck collaboration. For the foreseeable future, we anticipate the majority of our financial resources, other than those received from Merck and dedicated to Merck collaboration activities, will be dedicated to activities required to prepare aldafermin for potential regulatory approval for the treatment of NASH, including manufacturing of clinical trial materials and preparation for a potential pivotal program.

In the future, we may devote financial resources to other programs in the event Merck does not elect to license these programs upon completion of a proof-of-concept study, in the event Merck elects to terminate its license to any program it licenses or in the event we opt to co-develop any Merck-licensed programs, or if Merck no longer funds such programs under modified terms of the collaboration.

Our R&D efforts under the Merck collaboration are extensive and costly and are currently subject to reimbursement under our Merck collaboration during the current two-year extension up to the funding caps

provided in our Collaboration Agreement. If our R&D expenses for product candidates subject to the Merck collaboration, including the clinical development of product candidates subject to the Merck collaboration through completion of proof-of-concept studies, exceed the funding caps provided in the Collaboration Agreement, which happened in the fiscal year ended December 31, 2020 and could happen in the future, we will be required to devote our own financial resources toward the development of such product candidates or, if we are unwilling or unable to do so, pause or suspend such development to remain within the funding caps. In addition, while we cannot predict whether or when Merck will elect to extend the research phase of the collaboration through March 16, 2024 or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the current research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms.

The successful development of our product candidates is highly uncertain. At this time, we cannot reasonably estimate the nature, timing or costs of the efforts that will be necessary to complete the remainder of the development of our product candidates. This is due to the numerous risks and uncertainties associated with developing medicines, including the uncertainty of:

- our ability to hire and retain key R&D personnel;
- manufacturing scale-up challenges, production shortages or other supply disruptions for clinical trial materials;
- the evolving effects of the COVID-19 pandemic on our employees, patients, clinical trial sites and our CROs, CMOs and other service providers;
- the timely and quality performance of our CROs, CMOs and other service providers;
- whether Merck will elect to license, or to terminate its license, to any of our programs and the timing of such election or termination;
- whether we exceed the current or any future funding caps provided in our Collaboration Agreement and whether Merck decides not to proceed with certain of our product candidates after the end of the research phase;
- the effect of products that may compete with our product candidates or other market developments;
- our ability to expand and enforce our intellectual property portfolio;
- the scope, rate of progress, results and expense of our ongoing, as well as any future, clinical trials and other R&D-related activities; and
- the impact and timing of any interactions with regulatory authorities.

A change in the outcome of any of the risks and uncertainties associated with the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. For example, if the FDA or another regulatory authority were to require us to conduct clinical trials beyond those that we currently anticipate will be required for the completion of clinical development of a product candidate, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development. For additional discussion of the risks and uncertainties associated with our R&D efforts, see “Risk Factors—Risks Related to Our Business and Industry,” “—Risks Related to Our Dependence on Merck and Other Third Parties,” and “—Risks Related to Regulatory Approvals” in Part I, Item 1A of this Annual Report on Form 10-K.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and other related costs, including stock-based compensation and benefits. Other significant costs include legal fees relating to patent and corporate matters, facility costs not otherwise included in R&D expenses and fees for accounting and other consulting services.

We anticipate that our general and administrative expenses will increase in the future to support our continued R&D activities. These increases will likely include increased costs related to the hiring of additional personnel, as well as fees paid to outside consultants, lawyers and accountants, among other expenses. Additionally, we anticipate continued increased costs associated with being a public company, including expenses related to services associated with maintaining compliance with Nasdaq listing rules and related SEC requirements and costs related to insurance, investor relations and SOX 404 compliance. In addition, we may incur expenses associated with building a commercial organization in connection with, and prior to, potential future regulatory approval of our product candidates.

Results of Operations

Our results of operations were as follows (in thousands):

	Year Ended December 31,			Change	
	2020	2019	2018	2020 vs 2019	2019 vs 2018
Related party revenue	$ 87,368	$ 103,544	$ 108,665	$ (16,176)	$ (5,121)
Operating expenses:					
Research and development	163,972	129,253	95,714	34,719	33,539
General and administrative	27,229	23,631	17,265	3,598	6,366
Total operating expenses	191,201	152,884	112,979	38,317	39,905
Loss from operations	(103,833)	(49,340)	(4,314)	(54,493)	(45,026)
Interest income	1,939	6,692	3,622	(4,753)	3,070
Other income (expense), net	(593)	(147)	199	(446)	(346)
Net loss	$ (102,487)	$ (42,795)	$ (493)	$ (59,692)	$ (42,302)

Related Party Revenue from Merck

Revenue decreased $16.2 million in the year ended December 31, 2020 compared to the same period in 2019 primarily due to a decrease of $14.9 million related to the recognition of a portion of the initial upfront payment received from Merck that was included within the transaction price and recognized over the initial five-year term of our Collaboration Agreement using the cost-based input model. The initial five-year term ended in the first quarter of 2020. Revenue decreased $5.1 million in the year ended December 31, 2019 compared to the same period in 2018 primarily due to license revenue of $20.0 million received in 2018 due to Merck's exercise of its option for MK-3655, partially offset by an increase of $9.7 million in reimbursable costs related to research personnel and R&D activities and an increase of $5.2 million in revenue associated with the change in revenue recognition methodology under ASC 606, which was effective January 1, 2019.

Research and Development Expenses

Our R&D expenses by program were as follows (in thousands):

	Year Ended December 31,		
	2020	2019	2018
External R&D expenses:			
Aldafermin (FGF19 analog)	$ 50,553	$ 32,001	$ 15,359
NGM621 (C3 inhibitor)	13,126	4,420	6,791
NGM120 (GFRAL antagonist)	5,606	3,414	3,442
NGM707 (Anti-ILT2/ILT4 dual antagonist)	4,817	2,295	-
NGM438 (LAIR1 antagonist)	3,586	1,302	-
NGM395 (GDF15 analog)	2,102	585	701
MK-3655 (FGFR1c/KLB agonist)	624	2,009	3,544
Other external R&D expenses	6,852	10,791	3,412
Total external R&D expenses	87,266	56,817	33,249
Personnel-related expenses	43,811	38,171	30,908
Internal and unallocated R&D expenses (1)	32,895	34,265	31,557
Total R&D expenses	$ 163,972	$ 129,253	$ 95,714

(1) Internal and unallocated R&D expenses consist primarily of research supplies and consulting fees, which we deploy across multiple R&D programs.

R&D expenses increased $34.7 million in the year ended December 31, 2020 compared to the same period in 2019 primarily due to a $31.0 million increase in external expenses driven by our manufacturing activities and ongoing clinical trials of aldafermin, NGM621, NGM120 and NGM395. The increase in R&D expenses in 2020 also included increases of $5.6 million in personnel-related expenses and $4.8 million in costs associated with pre-clinical IND-enabling studies for NGM707 and NGM438. These increases were partially offset by a decrease of $3.9 million in clinical trial materials and $1.4 million in unallocated R&D expenses related to multiple R&D programs.

R&D expenses increased $33.5 million in the year ended December 31, 2019 compared to the same period in 2018 primarily due to increases of $16.6 million in external expenses driven by ongoing clinical trials of aldafermin, $7.4 million related to clinical trial materials, $7.3 million in personnel-related expenses and $2.7 million in unallocated R&D expenses related to early research testing.

We expect R&D expenses in 2021 will increase compared to 2020 due to our ongoing activities, particularly as we advance our clinical development of aldafermin. In addition, we may be required to develop and implement additional clinical study policies and procedures to mitigate the evolving effects of the COVID-19 pandemic, which could significantly increase our R&D expenses.

General and Administrative Expenses

General and administrative expenses increased $3.6 million in the year ended December 31, 2020 compared to the same period in 2019 primarily due to an increase in personnel-related expenses due to increased headcount. General and administrative expenses increased $6.4 million in the year ended December 31, 2019 compared to the same period in 2018 primarily due to a $3.4 million increase in personnel-related expenses due to increased headcount and the implementation of our employee stock purchase plan and a $2.0 million increase in consulting expenses.

We anticipate general and administrative expenses in 2021 will increase compared to 2020 due to an increase in compensation-related expenses driven by higher headcount and other expenses related to the expansion and support of our business.

Interest Income

Interest income decreased $4.8 million in the year ended December 31, 2020 compared to the same period in 2019 primarily due to the decrease in market interest rates and a reduction in our cash balance. Interest income increased $3.1 million in the year ended December 31, 2019 compared to the same period in 2018

primarily due to an increase in our cash and investments balance subsequent to the completion of our IPO and concurrent private placement to Merck in April 2019.

Liquidity and Capital Resources

Funding Requirements

We have incurred net losses every year since our inception. We have spent, and expect to continue to spend, significant resources to fund R&D of, and seek regulatory approvals for, our product candidates, particularly aldafermin. These activities require us to incur substantial costs related to research, development, manufacturing, preclinical studies, clinical trial and related activities, as well as to cover other expenses related to our ongoing operations. For example, we will require substantial additional capital to achieve our development and commercialization goals for our aldafermin program that is being conducted outside of the Merck collaboration or for any other programs in the event Merck does not elect to license these programs upon completion of a proof-of-concept study, in the event Merck elects to terminate its license to any program it licenses or in the event we opt to co-develop any Merck-licensed programs, or if Merck no longer funds such programs under modified terms of the collaboration. In addition, while we cannot predict whether or when Merck will elect to extend the research phase of the collaboration through March 16, 2024 or on what terms, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. See ““Overview of Our Business – Merck Collaboration Update” above. As a result, we expect to incur significant and increasing operating losses. We have no products approved for commercial sale, have not generated any revenue from product sales to date and we are not and may never be profitable. We have incurred losses in each year since commencing operations. Our consolidated net losses were $102.5 million, $42.8 million and $0.5 million for the years ended December 31, 2020, 2019 and 2018, respectively. As of December 31, 2020, we had an accumulated deficit of $298.6 million and we expect our accumulated deficit will increase significantly over time. The size of our future net losses will depend, in part, on the rate of future growth of our expenses, how much revenue, if any, continues to be generated under the Merck collaboration and our ability to generate revenue outside of the Merck collaboration.

In addition, if our R&D expenses for product candidates subject to the Merck collaboration exceed the funding caps provided in our current Collaboration Agreement, which happened in the fiscal year ended December 31, 2020 and could happen in the future, or if Merck no longer funds such programs under modified terms of the collaboration, we will be required to devote our own financial resources toward the development of such product candidates or, if we are unwilling or unable to do so, pause or suspend such development to remain within the funding caps or to proceed with development of unfunded programs.

Sources of Liquidity

Merck Collaboration

The revenue we receive under our Collaboration Agreement with Merck is our only source of revenue. The original research phase of the Collaboration Agreement was for five years. As described in greater detail in “Overview of Our Business – Merck Collaboration Update” above, the parties are negotiating in good faith certain modifications to the terms of the collaboration. While we cannot predict whether or when Merck will elect to extend the research phase of the collaboration or on what terms, or whether or when we will reach agreement with Merck on the terms of a modified collaboration generally, we expect that any modified collaboration would result in a level of annual research support from Merck during any extension of the current research phase after March 16, 2022 that is meaningfully lower than the annual research support Merck provided during the initial five-year term and is providing during the current two-year extension of the research phase. In this regard, we expect that under the terms of a modified collaboration, Merck will not provide research funding for certain of our product candidates. We also expect that if we are unable to reach agreement with Merck on modified terms, Merck will not elect to extend the research phase of the collaboration and will decide not to proceed with certain of our product candidates after the end of the research phase. In any event, we expect that our funding obligations with respect to the development of our current and potential future product candidates will substantially increase following March 16, 2022, the end of the current two-year extension of the research phase, regardless of whether we are able to reach agreement with Merck on modified terms. Accordingly, we will require significant additional capital in order to proceed with development and commercialization of our current and potential future product candidates,

including any product candidate that had been subject to the Merck collaboration but Merck decides not to proceed with under the terms of a modified collaboration or after the end of the research phase, or we will need to enter into additional collaboration or license agreements in order to fund such development and commercialization. Neither may be possible and as a result, we may be required to delay, scale back or discontinue development of such product candidates.

Other Sources of Liquidity

In June 2020, we entered into the Sales Agreement with Jefferies relating to the sale of shares of our common stock. In accordance with the terms of the Sales Agreement, we may offer and sell shares of our common stock having an aggregate offering price of up to $150.0 million from time to time through Jefferies, acting as our sales agent. In December 2020, under the Sales Agreement, we sold 809,700 shares of our common stock at an average price of $27.94 per share for net proceeds of $21.9 million, after deducting $0.7 million in sales commissions. As of December 31, 2020, $127.4 million of our common stock remained available to be sold under the Sales Agreement, subject to certain conditions as specified in the Sales Agreement.

As of December 31, 2020, we had cash and cash equivalents of $147.0 million, short-term marketable securities of $148.1 million, working capital of $265.8 million and an accumulated deficit of $298.6 million.

In January 2021, we sold 5,324,074 shares of common stock (inclusive of shares sold pursuant to the full exercise of the option to purchase additional shares granted to the underwriters in connection with the offering) through an underwritten public offering at a price of $27.00 per share for aggregate net proceeds of approximately $134.7 million. We intend to use the net proceeds from this offering for working capital and other general corporate purposes, which may include funding our pipeline of development programs, general and administrative activities and capital expenditures.

We believe that our existing cash, cash equivalents and short-term marketable securities will be sufficient to fund our operations for at least the next twelve months. We have based this estimate on assumptions that may prove to be wrong and we could utilize our available capital resources sooner than we currently expect. In addition, our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially as a result of a number of factors, including the factors discussed under “Risk Factors” in Part I, Item 1A of this Annual Report on Form 10-K.

We plan to finance our future cash needs through public or private equity or debt offerings, including under the Sales Agreement, government or other third-party funding, product collaborations, strategic alliances, licensing arrangements or a combination of these. Additional capital may not be available in sufficient amounts, on reasonable terms or when we need it, if at all, and our ability to raise additional capital may be adversely impacted by worsening global economic conditions and the disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from, among other things, the evolving effects of the COVID-19 pandemic. If we raise additional funds by issuing equity securities, our stockholders may experience dilution. Debt financing, if available, may involve restrictive covenants. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders. Furthermore, any securities that we may issue may have rights senior to those of our common stock and could contain covenants or protective rights that would lead to restrictions on our operations and potentially impair our competitiveness, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. If we are unable to raise adequate additional capital, we may be prevented from pursuing development and commercialization efforts, which will have a material adverse effect on our business, operating results and prospects.

Cash Flow Activity

The following table summarizes our cash flow activity (in thousands):

	Year Ended December 31,		
	2020	2019	2018
Net cash provided by (used in):			
Operating activities	$ (83,496)	$ (41,174)	$ (7,597)
Investing activities	(50,998)	48,723	38,729
Financing activities	35,538	180,751	198
Net increase (decrease) in cash and cash equivalents	$ (98,956)	$ 188,300	$ 31,330

Cash Used in Operating Activities

Cash used in operating activities in 2020 was $83.5 million, which consisted of a net loss of $102.5 million, adjusted for non-cash charges of $22.3 million and net cash used in operating assets and liabilities of $3.3 million. The non-cash charges consisted primarily of stock-based compensation expense of $15.7 million and depreciation expense of $6.6 million. The change in operating assets and liabilities was mainly driven by increases in accrued expenses of $6.2 million, prepaid expenses and other current assets of $1.9 million, accounts payable of $0.9 million and a related party contract asset of $6.1 million. These increases were offset by a decrease in deferred rent of $2.8 million.

Cash used in operating activities in 2019 was $41.2 million, which consisted of a net loss of $42.8 million, adjusted for non-cash charges of $19.6 million and net cash used in operating assets and liabilities of $17.9 million. The non-cash charges consisted primarily of stock-based compensation expense of $12.9 million and depreciation expense of $7.6 million. The change in operating assets and liabilities was mainly driven by increases in the related party receivable of $1.5 million, prepaid expenses and other current assets of $2.0 million, accounts payable of $3.6 million and accrued expenses and other current liabilities of $8.9 million. These increases were offset by decreases in deferred rent of $2.7 million and contract liabilities of $24.2 million, which was primarily due to the adoption of ASC 606 and the timing of advance payments from Merck related to the reimbursement of costs associated with research and development activities.

Cash used in operating activities in 2018 was $7.6 million, which consisted of a net loss of $0.5 million, adjusted for non-cash charges of $16.5 million and cash used in operating assets and liabilities of $23.6 million. The non-cash charges consisted primarily of stock-based compensation expense of $9.9 million and depreciation expense of $7.2 million. The change in operating assets and liabilities was primarily due to increases in the related party receivable of $3.7 million, prepaid expenses and other current assets of $4.4 million, accounts payable of $3.5 million and accrued expenses and other current liabilities of $4.1 million. These increases were offset by decreases in deferred rent and contract liabilities of $2.0 million and $21.1 million, respectively. The decrease in contract liabilities is primarily due to the recognition of upfront fees from Merck and the timing of advance payments from Merck related to the reimbursement of costs associated with research and development activities.

Cash Provided by (Used in) Investing Activities

Cash used in investing activities in 2020 was $51.0 million, which consisted of purchases of marketable securities of $177.7 million and purchases of property and equipment of $1.9 million partially offset by net proceeds on maturity of marketable securities of $128.5 million. Cash provided by investing activities in 2019 was $48.7 million, which consisted of net proceeds on maturity of marketable securities of $186.5 million partially offset by purchases of marketable securities of $134.3 million and purchases of property and equipment of $3.5 million. Cash provided by investing activities in 2018 was $38.7 million, which consisted of net proceeds on maturity of marketable securities of $178.2 million partially offset by purchases of marketable securities of $133.6 million and purchases of property and equipment of $5.8 million.

Cash Provided by Financing Activities

Cash provided by financing activities in 2020 was $35.5 million and primarily related to net proceeds from the Sales Agreement of $21.9 million and proceeds from employee equity incentive and purchase plans of $14.2 million. Cash provided by financing activities in 2019 was $180.8 million and primarily related to net proceeds from our IPO of $110.0 million, proceeds from a concurrent private placement with Merck of $65.9 million and proceeds from employee equity incentive and purchase plans of $4.8 million. Cash provided by financing activities in 2018 was $0.2 million and primarily related to proceeds from employee equity incentive plans of $2.6 million partially offset by deferred IPO costs of $2.2 million.

Off-Balance Sheet Arrangements

We currently have not entered into and do not have any relationships with unconsolidated entities or financial collaborations, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purpose.

Contractual Obligations

The following table sets out, as of December 31, 2020, our contractual obligations due by period (in thousands):

	Payments due by period				
	Less than 1 year	1 to 3 years	4 to 5 years	More than 5 years	Total
Contractual obligations:					
Operating lease obligations[1]	$ 5,141	$ 10,749	$ —	$ —	$ 15,890
Total contractual obligations	$ 5,141	$ 10,749	$ —	$ —	$ 15,890

(1) Consists of our corporate headquarters lease encompassing approximately 122,000 square feet of office and laboratory space that expires in December 2023.

We enter into agreements in the normal course of business with CROs, CMOs and other vendors for preclinical studies and other services and products for operating purposes that are generally cancelable at any time by us, upon prior written notice, and may or may not include cancellation fees. Given that the amount and timing related to such payments are uncertain, they have not been included in the contractual obligations table above.

We are obligated to make future payments to third parties under in-license agreements, including sublicense fees, low single-digit royalties and payments that become due and payable on the achievement of certain development and commercialization milestones. As the amount and timing of sublicense fees and the achievement and timing of these milestones are not probable and estimable, such commitments have not been included on our consolidated balance sheets or in the contractual obligations table above.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which we have prepared in accordance with U.S. generally accepted accounting principles, or U.S. GAAP. The preparation of our consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of our consolidated financial statements, as well as revenue and expenses during the reported periods. We evaluate these estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ materially from these estimates under different assumptions or conditions.

Our significant accounting policies are described in Note 2 to our consolidated financial statements included in Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K.

We believe that the following accounting policies are the most critical for fully understanding and evaluating our financial condition and results of operations.

Revenue Recognition

On January 1, 2019, we adopted Accounting Standards Update, or ASU, 2014-09, Revenue from Contracts with Customers (Topic 606), and subsequent amendments, using the modified retrospective transition method applied to those contracts that were not completed as of January 1, 2019. ASC 606 supersedes all prior revenue recognition guidance. Results for operating periods beginning after January 1, 2019 are presented under ASC 606, while prior period amounts have not been adjusted and continue to be reported in accordance with previous accounting rules under ASC 605.

Prior to the adoption of ASC 606, our revenue from collaboration agreements was recognized when we determined that persuasive evidence of an arrangement existed, services had been rendered, the price was fixed or determinable and collectability was reasonably assured. We would record amounts received prior to satisfying the above revenue recognition criteria as contract liabilities until all applicable revenue recognition criteria were met. Revenue allocated to research activities was generally recognized in the period the services were performed, and revenue allocated to licenses was generally recognized on a straight-line basis over the contractual term. Allocations to non-contingent elements were based on the relative selling price of each element using vendor-specific objective evidence or third-party evidence, where available. In the absence of either of these measures, we used the best estimate of selling price for that deliverable.

The most significant change to our policies upon the adoption of ASC 606 was the estimation of an arrangement's total transaction price, which includes unconstrained variable consideration, and the recognition of that transaction price based on a cost-based input method that requires estimates to determine, at each reporting period, the percentage of completion based on the estimated total effort required to complete the project and the total transaction price. Given the differences in revenue recognition policies, the revenue recognized in years prior to 2019 is not strictly comparable to revenue recorded in the year ending December 31, 2019 or in future periods (see "Recently Adopted Accounting Pronouncements" in our consolidated financial statements).

The core principle in ASC 606 requires an entity to recognize revenue upon the transfer of goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. We apply the following five-step revenue recognition model outlined in ASC 606 to adhere to this core principle: (1) identify the contract(s) with a customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when (or as) we satisfy a performance obligation.

All of our revenue to date has been generated from collaboration agreements, primarily the Collaboration Agreement. The terms of these agreements generally require us to provide (i) license options for our product candidates, (ii) R&D services and (iii) non-mandatory services in connection with participation in research or steering committees. Payments received under these arrangements may include non-refundable upfront license fees, partial or complete reimbursement of R&D costs, contingent consideration payments based on the achievement of defined collaboration objectives and royalties on sales of commercialized products. In some agreements, the collaboration partner is solely responsible for meeting defined objectives that trigger contingent or royalty payments. Often the partner only pursues such objectives subsequent to exercising an optional license on compounds identified as a result of the R&D services performed.

We assess whether the promises in our arrangements, including any options provided to the customer, are considered distinct performance obligations that should be accounted for separately. Judgment is required to determine whether the license to a compound is distinct from R&D services or participation in steering committees, as well as whether options create material rights in the contract.

The transaction price in each arrangement is generally comprised of a non-refundable upfront fee and unconstrained variable consideration related to the performance of R&D services. We typically submit a budget for the R&D services to the customer in advance of performing the services. The transaction price is allocated to the identified performance obligations based on the standalone selling price, or SSP, of each distinct performance obligation. Judgment is required to determine SSP. In instances where SSP is not directly observable, such as when a license or service is not sold separately, SSP is determined using information that may include market conditions and other observable inputs. We utilize judgment to assess the nature of our performance obligations

to determine whether they are satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress toward completion. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

Our collaboration agreements may include contingent payments related to specified development and regulatory milestones or contingent payments for royalties based on sales of a commercialized product. Milestones can be achieved for such activities in connection with progress in clinical trials, regulatory filings in various geographical markets and marketing approvals from regulatory authorities. Sales-based royalties are generally related to the volume of annual sales of a commercialized product. At the inception of each agreement that includes such payments, we evaluate whether the milestones are considered probable of being achieved and estimate the amount to be included in the transaction price by 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 or our customer's control, such as those related to regulatory approvals, are not considered probable of being achieved until those approvals are received. The transaction price is then allocated to each performance obligation based on a relative SSP basis. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of each such milestone and any related constraint and, if necessary, adjust our estimate of the overall transaction price. Pursuant to the guidance in ASC 606, sales-based royalties are not included in the transaction price. Instead, royalties are recognized at the later of when the performance obligation is satisfied or partially satisfied, or when the sale that gives rise to the royalty occurs.

Accrued Research and Development Expenses

As part of the process of preparing these consolidated financial statements, we are required to estimate and accrue expenses, the largest of which are R&D expenses. This process involves:

- identifying services that have been performed on our behalf by third-party vendors and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of actual cost;
- estimating and accruing expenses in our consolidated financial statements as of each balance sheet date based on facts and circumstances known to us at the time; and
- periodically confirming the accuracy of our estimates with selected service providers and making adjustments, if necessary.

Examples of estimated R&D expenses that we accrue include:

- fees paid to CROs in connection with preclinical studies and clinical trials;
- fees paid to investigative sites in connection with clinical trials;
- fees paid to CMOs in connection with the production of clinical trial materials and to procure raw materials and components for manufacture; and
- professional service fees for consulting and other services.

We base our expense accruals related to clinical trials on our estimates of the services received and efforts expended pursuant to contracts with multiple research institutions and CROs that conduct and manage clinical trials on our behalf. The financial terms of these agreements vary from contract to contract and may result in uneven payment flows. Payments under some of these contracts depend on factors such as the successful enrollment of patients and the completion of clinical study milestones. Our service providers generally invoice us monthly in arrears for services performed. 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 we do not identify costs that we have begun to incur or if we underestimate or overestimate the level of services performed or the costs of these services, our actual expenses could differ from our estimates.

All of our clinical trials have been executed with support from CROs and other vendors. We accrue costs for clinical trial activities performed by CROs based upon the estimated amount of work completed on each trial. For clinical trial expenses, the significant factors used in estimating accruals include the number of patients enrolled, the activities to be performed for each patient, the number of active clinical sites and the duration for which the patients will be enrolled in the trial. We monitor patient enrollment levels and related activities to the

extent possible through internal reviews, correspondence with CROs and review of contractual terms. We base our estimates on the best information available at the time.

To date, we have not experienced significant changes in our estimates of accrued R&D expenses after a reporting period. However, due to the nature of estimates, we cannot assure that we will not make changes to our estimates in the future as we become aware of additional information about the status or conduct of our clinical trials and other research activities.

Stock-Based Compensation

Stock-based compensation expense represents the grant-date fair value of employee stock option granted under our 2008 Equity Incentive Plan and our 2018 Equity Incentive Plan and rights to acquire stock granted under our 2019 Employee Stock Purchase Plan recognized over the requisite service period of the awards (usually the vesting period) on a straight-line basis, net of estimated forfeitures.

On January 1, 2019, we adopted ASU 2018-07, Compensation – Stock Compensation (Topic 718): Improvements to Non-Employee Share-Based Payment Accounting. Subsequent to the adoption of ASU 2018-07, stock-based compensation expense for non-employee stock-based awards is also measured based on the fair value on grant date with its estimated fair value recorded over the requisite service period of the awards (usually the vesting period) on a straight-line basis, net of estimated forfeitures.

We calculate the fair value of stock-based compensation awards using the Black-Scholes option-pricing model. The Black-Scholes option-pricing model requires the use of subjective assumptions, including stock price volatility, the expected life of stock options, risk-free interest rate and the fair value of the underlying common stock on the date of grant.

The expected volatility is based on the historical volatility of the stock of similar entities within our industry over periods commensurate with our expected term assumption. The expected term of stock option grants represents the weighted-average period the options are expected to remain outstanding and is based on the “simplified” method where the expected term is the midpoint between the vesting date and the end of the contractual term for each option. We base the risk-free interest rate on the interest rate payable on U.S. Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected option term. In reference to the expected dividend yield assumption, we have not historically paid and do not expect for the foreseeable future to pay, a dividend.

We recorded stock-based compensation expense related to employees, directors and nonemployees of $15.7 million, $12.9 million and $9.9 million for the years ended December 31, 2020, 2019 and 2018, respectively. As of December 31, 2020, we had unrecognized stock-based compensation cost related to options granted to employees and directors of $29.6 million, net of forfeitures, which is expected to be recognized as expense over a period of approximately 2.75 years.

Prior to the closing of our IPO, the fair value of the common stock underlying our share-based awards was estimated on each grant date by our board of directors. In order to determine the fair value of our common stock underlying option grants, our board of directors considered, among other things, timely valuations of our common stock prepared by an unrelated third-party valuation firm in accordance with the guidance provided by the American Institute of Certified Public Accountants, or AICPA, Practice Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*. Given the absence of a public trading market for our common stock historically, our board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of our common stock, including our stage of development; progress of our research and development efforts; the rights, preferences and privileges of our convertible preferred stock relative to those of our common stock; equity market conditions affecting comparable public companies; and the lack of marketability of our common stock.

After our IPO, the fair market value of each share of underlying common stock is determined based on the closing price of our common stock as reported by the Nasdaq Global Select Market on the date of grant.

JOBS Act Accounting Election

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, as amended, the JOBS Act. Under the JOBS Act, emerging growth companies may delay the adoption of new or

revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards would otherwise apply to private companies.

The JOBS Act permits an “emerging growth company” such as us to take advantage of an extended transition time to comply with new or revised accounting standards as applicable to public companies. We have elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act until the earlier of the date we (i) are no longer an emerging growth company or (ii) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, our financial statements may not be comparable to companies that comply with new or revised accounting pronouncements as of public company effective dates.

We will remain an emerging growth company until the earlier to occur of (1) (a) December 31, 2024, (b) the last day of the fiscal year in which our annual gross revenue is $1.07 billion or more or (c) the date on which we are deemed to be a “large-accelerated filer,” under the rules of the SEC, which means the market value of our equity securities that is held by non-affiliates exceeds $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Recent Accounting Pronouncements

See Note 2 to our consolidated financial statements included in Part II, Item 8, “Financial Statements and Supplementary Data,” of this Annual Report on Form 10-K for a description of recent accounting pronouncements applicable to our business.

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

We are exposed to market risks in the ordinary course of our business, primarily related to interest rate and foreign currency sensitivities.

Interest Rate Sensitivity

We are exposed to market risk related to changes in interest rates. We had cash, cash equivalents and short-term marketable securities of $295.2 million as of December 31, 2020, which consisted primarily of money market funds and marketable securities, largely composed of investment grade, short-to-intermediate term fixed income securities.

The primary objective of our investment activities is to preserve capital to fund our operations. We also seek to maximize income from our investments without assuming significant risk. To achieve our objectives, we maintain a portfolio of investments in a variety of securities of high credit quality and short-term duration, according to our board-approved investment charter. Our investments are subject to interest rate risk and could fall in value if market interest rates increase. A hypothetical 10% relative change in interest rates during any of the periods presented would not have had a material impact on our consolidated financial statements.

Foreign Currency Sensitivity

The majority of our transactions occur in U.S. dollars. However, we do have certain transactions that are denominated in currencies other than the U.S. dollar, primarily British Pounds, Swiss Francs, Australian dollars and the Euro, and we therefore are subject to foreign exchange risk. The fluctuation in the value of the U.S. dollar against other currencies affects the reported amounts of expenses, assets and liabilities associated with a limited number of manufacturing, preclinical and clinical activities. A hypothetical 10% change in foreign currency exchange rates during any of the periods presented would not have had a material impact on our consolidated financial statements.

Item 8. Financial Statements and Supplementary Data.

NGM BIOPHARMACEUTICALS, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of
NGM Biopharmaceuticals, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of NGM Biopharmaceuticals, Inc. (the “Company”) as of December 31, 2020 and 2019, and the related consolidated statements of operations, comprehensive loss, convertible preferred stock and stockholders’ equity (deficit) and cash flows for each of the three years in the period ended December 31, 2020, 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, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company’s auditor since 2008.

Redwood City, California
March 15, 2021

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED BALANCE SHEETS
(In thousands, except share amounts)

	December 31, 2020	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 147,017	$ 245,598
Short-term marketable securities	148,139	98,913
Related party receivable from collaboration	333	5,206
Related party contract asset	6,100	—
Prepaid expenses and other current assets	6,837	5,531
Total current assets	308,426	355,248
Property and equipment, net	14,526	19,475
Restricted cash	1,499	1,874
Other non-current assets	4,592	3,806
Total assets	$ 329,043	$ 380,403
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 9,663	$ 9,026
Accrued liabilities	29,945	22,991
Deferred rent, current	2,975	2,829
Contract liabilities	—	4,872
Total current liabilities	42,583	39,718
Non-current liabilities:		
Deferred rent, non-current	6,417	9,392
Early exercise stock option liability	—	574
Total liabilities	49,000	49,684
Commitments and contingencies (Note 6)		
Stockholders' equity:		
Preferred stock, $0.001 par value; 10,000,000 shares authorized; no shares issued or outstanding as of December 31, 2020 and 2019, respectively	—	—
Common stock, $0.001 par value; 400,000,000 shares authorized; 70,585,364 and 66,960,279 shares issued and outstanding as of December 31, 2020 and 2019, respectively	71	67
Additional paid-in capital	578,599	526,771
Accumulated other comprehensive gain	4	25
Accumulated deficit	(298,631)	(196,144)
Total stockholders' equity	280,043	330,719
Total liabilities and stockholders' equity	$ 329,043	$ 380,403

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except share and per share amounts)

	Year Ended December 31,		
	2020	**2019**	**2018**
Related party revenue	$ 87,368	$ 103,544	$ 108,665
Operating expenses:			
Research and development	163,972	129,253	95,714
General and administrative	27,229	23,631	17,265
Total operating expenses	191,201	152,884	112,979
Loss from operations	(103,833)	(49,340)	(4,314)
Interest income	1,939	6,692	3,622
Other income (expense), net	(593)	(147)	199
Net loss	$ (102,487)	$ (42,795)	$ (493)
Net loss per share, basic and diluted	$ (1.50)	$ (0.85)	$ (0.08)
Weighted average shares used to compute net loss per share, basic and diluted	68,475,378	50,297,524	6,383,751

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In thousands)

	Year Ended December 31,		
	2020	**2019**	**2018**
Net loss	$ (102,487)	$ (42,795)	$ (493)
Other comprehensive gain (loss), net of tax:			
Net unrealized gain (loss) on available-for-sale marketable securities	(21)	292	164
Total comprehensive loss	$ (102,508)	$ (42,503)	$ (329)

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)
(In thousands)

	Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Other Comprehensive Gain (Loss)	Accumulated Deficit	Total Stockholders' Equity(Deficit)
	Shares	Amount	Shares	Amount				
Balance at December 31, 2017	47,267	$ 294,874	6,105	$ 6	$ 26,147	$ (431)	$ (146,700)	$ (120,978)
Issuance of common stock to participants in 401(k) Plan	—	—	11	—	91	—	—	91
Issuance of common stock upon exercise of stock options	—	—	479	1	2,582	—	—	2,583
Vesting of common stock from early exercises	—	—	161	—	764	—	—	764
Repurchase of common stock	—	—	(23)	—	(185)	—	—	(185)
Stock-based compensation expense	—	—	—	—	9,859	—	—	9,859
Changes in unrealized gain on available-for-sale securities, net of tax	—	—	—	—	—	164	—	164
Net loss	—	—	—	—	—	—	(493)	(493)
Balance at December 31, 2018	47,267	$ 294,874	6,733	$ 7	$ 39,258	$ (267)	$ (147,193)	$ (108,195)
Cumulative effect adjustment upon adoption of ASU 2014-09	—	—	—	—	—	—	(6,156)	(6,156)
Net exercise of preferred stock warrant to Series A preferred stock	16	198	—	—	—	—	—	—
Conversion of Series A, B, C, D, E convertible preferred stock to common stock concurrent with initial public offering	(47,283)	(295,072)	47,283	47	295,025	—	—	295,072
Issuance of common stock upon initial public offering, net of issuance costs	—	—	7,521	8	107,748	—	—	107,756
Issuance of common stock upon private placement	—	—	4,122	4	65,943	—	—	65,947
Issuance of common stock to participants in 401(k) Plan	—	—	8	—	98	—	—	98
Issuance of common stock upon exercise of stock options	—	—	984	1	3,574	—	—	3,575
Issuance of common stock in connection with employee stock purchase plan	—	—	103	—	1,270	—	—	1,270
Vesting of common stock from early exercises	—	—	132	—	993	—	—	993
Stock-based compensation expense	—	—	—	—	12,862	—	—	12,862
Changes in unrealized gain on available-for-sale securities, net of tax	—	—	—	—	—	292	—	292
Net loss	—	—	—	—	—	—	(42,795)	(42,795)
Balance at December 31, 2019	—	$ —	66,886	$ 67	$ 526,771	$ 25	$ (196,144)	$ 330,719
Issuance of common stock upon exercise of stock options	—	—	2,616	3	11,835	—	—	11,838
Issuance of common stock under Open Market Agreement, net of issuance costs	—	—	810	1	21,329	—	—	21,330
Issuance of common stock in connection with employee stock purchase plan	—	—	197	—	2,370	—	—	2,370
Vesting of common stock from early exercises	—	—	68	—	524	—	—	524
Issuance of common stock to participants in 401(k) Plan	—	—	6	—	119	—	—	119
Stock-based compensation expense	—	—	—	—	15,651	—	—	15,651
Changes in unrealized gain on available-for-sale securities, net of tax	—	—	—	—	—	(21)	—	(21)
Net loss	—	—	—	—	—	—	(102,487)	(102,487)
Balance at December 31, 2020	—	$ —	70,583	$ 71	$ 578,599	$ 4	$ (298,631)	$ 280,043

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,		
	2020	**2019**	**2018**
Cash flows from operating activities			
Net loss	$ (102,487)	$ (42,795)	$ (493)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation	6,555	7,605	7,223
Amortization of discount on marketable securities	(128)	(1,123)	(876)
Stock-based compensation expense	15,651	12,862	9,859
Other non-cash expenses	613	217	271
Changes in operating assets and liabilities:			
Related party receivable from collaboration	4,873	(1,537)	(3,669)
Related party contract asset	(6,100)	—	—
Prepaid expenses and other assets	(1,864)	(1,988)	(4,365)
Accounts payable	910	3,642	3,484
Accrued and other liabilities	6,182	8,877	4,059
Deferred rent	(2,829)	(2,683)	(1,957)
Contract liabilities	(4,872)	(24,251)	(21,133)
Net cash used in operating activities	(83,496)	(41,174)	(7,597)
Cash flows from investing activities			
Purchase of marketable securities	(177,655)	(134,306)	(133,609)
Proceeds from sales and maturities of marketable securities	128,536	186,518	178,182
Purchase of property and equipment	(1,879)	(3,489)	(5,844)
Net cash provided by (used in) investing activities	(50,998)	48,723	38,729
Cash flows from financing activities			
Proceeds from initial public offering, net of issuance costs	—	109,959	—
Proceeds from private placement of common stock	—	65,947	—
Proceeds from Open Market Agreement	21,943	—	—
Proceeds from exercise of stock options	11,838	3,575	2,583
Proceeds from employee stock purchase plan	2,370	1,270	—
Repurchase of common stock	—	—	(185)
Deferred offering costs paid	(613)	—	(2,200)
Net cash provided by financing activities	35,538	180,751	198
Net increase (decrease) in cash and cash equivalents	(98,956)	188,300	31,330
Cash, cash equivalents and restricted cash at beginning of period	247,472	59,172	27,842
Cash, cash equivalents and restricted cash at end of period	$ 148,516	$ 247,472	$ 59,172
Supplemental disclosures of cash flow information			
Net exercise of convertible preferred stock warrant to Series A preferred stock	$ —	$ 198	$ —
Vesting of common stock from early exercises	$ 524	$ 993	$ 764
Property and equipment purchases accrued and not yet paid	$ 20	$ 305	$ 607
Deferred offering costs accrued and not yet paid	$ 228	$ —	$ 92

See accompanying notes to consolidated financial statements.

1. Organization and Description of Business

NGM Biopharmaceuticals, Inc. and its wholly-owned subsidiary, collectively referred to as the Company, is focused on discovering and developing novel therapeutics based on scientific understanding of key biological pathways underlying liver and metabolic diseases, retinal diseases and cancer. The Company's robust portfolio of product candidates range from early discovery to late-stage development and include aldafermin, MK-3655, NGM621, NGM120, NGM707 and NGM438. The Company has additional undisclosed programs that are in various stages of development ranging from functional validation to preclinical development.

The Company was incorporated in Delaware in December 2007 and commenced operations in 2008. The Company's headquarters are located at 333 Oyster Point Blvd., South San Francisco, California 94080.

Stock Split

On March 22, 2019, the Company filed an amendment to the Company's amended and restated certificate of incorporation to effect a reverse split of shares of the Company's common stock on a two-for-one basis, or the Reverse Stock Split. In connection with the Reverse Stock Split, the conversion ratio for the Company's outstanding convertible preferred stock was proportionately adjusted such that the common stock issuable upon conversion of such preferred stock was decreased in proportion to the Reverse Stock Split. The par value of the common stock was not adjusted as a result of the Reverse Stock Split. All references to common stock, options to purchase common stock, early exercised options, share data, per share data, convertible preferred stock (to the extent presented on an as-converted to common stock basis) and related information contained in these consolidated financial statements have been retrospectively adjusted to reflect the effect of the Reverse Stock Split for all periods presented.

Initial Public Offering

On April 8, 2019, the Company closed the initial public offering, or IPO, of its common stock. In connection with the IPO, the Company sold an aggregate of 7,521,394 shares of common stock, including 854,727 shares sold pursuant to the underwriters' exercise of their option to purchase additional shares, at a public offering price of $16.00 per share. The aggregate net proceeds received by the Company for shares sold in the offering was $107.8 million, after deducting underwriting discounts, commissions and offering expenses of $4.1 million, of which $2.2 million were paid in 2018. Upon the closing of the IPO, all shares of the Company's outstanding convertible preferred stock were automatically converted to 47,283,839 shares of common stock and the related carrying amount of $295.1 million was reclassified to common stock and additional paid-in capital within stockholders' equity (deficit).

Concurrent with the closing of the IPO, the Company also issued 4,121,683 shares of its common stock to Merck Sharp & Dohme Corp., or Merck, in a private placement at a price of $16.00 per share for proceeds of $65.9 million, which resulted in Merck owning approximately 19.9% of the Company's outstanding shares of common stock at that time.

2. Summary of Significant Accounting Policies

Basis of Presentation and Principles of Consolidation

The consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles, or U.S. GAAP, and include the consolidated accounts of the Company and its wholly-owned subsidiary in Australia. All intercompany balances and transactions have been eliminated upon consolidation.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make judgments, assumptions and estimates that affect the amounts reported in the consolidated financial statements and accompanying notes. Management bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results could differ materially from those estimates.

Uses and Sources of Liquidity

Since inception, the Company has incurred net losses and negative cash flow from operations. During the years ended December 31, 2020, 2019 and 2018, the Company incurred net losses of $102.5 million, $42.8 million and $0.5 million, respectively. As of December 31, 2020, the Company had an accumulated deficit of $298.6 million. The Company expects its accumulated deficit will increase significantly over time and does not expect to experience positive cash flows from operations in the near future.

In December 2020, under an Open Market Sale Agreement℠, or the Sales Agreement, entered into with Jefferies LLC in June 2020, the Company sold 809,700 shares of its common stock at an average price of $27.94 per share for net proceeds of $21.9 million. As of December 31, 2020, $127.4 million of its common stock remained available to be sold under the Sales Agreement, subject to certain conditions as specified in the Sales Agreement.

As of December 31, 2020, the Company had $295.2 million of cash, cash equivalents and short-term marketable securities. In January 2021, the Company sold 5,324,074 shares of its common stock through an underwritten public offering at a price of $27.00 per share for aggregate net proceeds of approximately $134.7 million after deducting underwriting discounts and commissions and other estimated offering expenses payable by the Company. See Note 10 for additional information. The Company believes that the net proceeds from this offering, together with its existing cash, cash equivalents and short-term marketable securities, will be sufficient to fund its operations for a period of at least one year from the date these consolidated financial statements are issued.

To fully implement the Company's business plan and fund its operations, the Company will need to raise additional capital through public or private equity offerings (which may include potential net proceeds from future sales, if any, under the Sales Agreement), debt financings, government or other third-party funding, collaborations, strategic alliances and licensing arrangements or a combination of the foregoing.

Fair Value of Financial Instruments

The carrying amounts of cash and cash equivalents, the related party receivable from collaboration and other current assets and liabilities approximate their respective fair values due to their short-term nature.

Cash and Cash Equivalents

Cash and cash equivalents are stated at fair value. Cash equivalents are securities with an original maturity of three months or less at the time of purchase. The Company limits its credit risk associated with cash and cash equivalents by placing its investments with a bank it believes is highly creditworthy and with highly rated money market funds. As of December 31, 2020 and 2019, cash and cash equivalents consisted of bank deposits and investments in money market funds.

Marketable Securities

The appropriate classification of the Company's marketable securities is determined at the time of purchase and such designations are re-evaluated at each balance sheet date. All of the Company's securities are considered as available-for-sale and carried at estimated fair values and reported in cash equivalents and short-term marketable securities. Unrealized gains and losses on available-for-sale securities are excluded from net loss and reported in accumulated other comprehensive gain as a separate component of stockholders' equity. Other income (expense), net, includes interest, amortization of purchase premiums and accretion of purchase discounts, realized gains and losses on sales of securities and other-than-temporary declines in the fair value of securities, if any. The cost of securities sold is based on the specific identification method.

The Company's investments are regularly reviewed for other-than-temporary declines in fair value. This review includes the consideration of the cause of the impairment, including the creditworthiness of the security issuers, the number of securities in an unrealized loss position, the severity and duration of the unrealized losses, whether the Company has the intent to sell the securities and whether it is more likely than not that the Company will be required to sell the securities before the recovery of their amortized cost basis. When the Company determines that the decline in fair value of an investment is below its carrying value and this decline is other-than-temporary, the Company reduces the carrying value of the security it holds and records a loss for the amount of such decline. As of December 31, 2020, the Company did not record any impairment related to other-than-temporary declines in the fair value of securities.

Restricted Cash

The Company's restricted cash balance represents collateral required under the Company's facility lease agreement and is classified as a non-current asset on the consolidated balance sheets, as the collateral will not be returned to the Company in 2021.

Concentration of Credit and Other Risks

Cash and cash equivalents and marketable securities from the Company's available-for-sale and marketable security portfolio potentially subject the Company to concentrations of credit risk. The Company is invested in money market funds and marketable securities through custodial relationships with major U.S. and Australian banks. Under its investment policy, the Company limits amounts invested in such securities by credit rating, maturity, industry group, investment type and issuer, except for securities issued by the U.S. government.

Related party receivables from collaborations are typically unsecured. Accordingly, the Company may be exposed to credit risk generally associated with its current collaboration agreement with Merck and any future collaboration agreements with other collaboration partners. To date, the Company has not experienced any losses related to these receivables.

Amounts recognized as revenue prior to the Company having an unconditional right (other than a right that is conditioned only on the passage of time) to receipt are recorded as contract assets in the Company's consolidated balance sheets. Although the Company expects to have an unconditional right to receive such amounts, the Company may be exposed to the risk of not receiving the recorded amounts under its current collaboration agreement with Merck and any future collaboration agreements with other collaboration partners. To date, the Company has not experienced any losses related to contract assets.

Merck accounted for 100% of the Company's revenue for the years ended December 31, 2020, 2019 and 2018.

Property and Equipment, Net

Property and equipment is recorded at cost and consists of computer equipment, laboratory equipment and office furniture and leasehold improvements. Maintenance and repairs, and training on the use of equipment, are expensed as incurred. Costs that improve assets or extend their economic lives are capitalized. Depreciation is recognized using the straight-line method based on an estimated useful life of the asset, which is as follows:

Computer equipment	3 years
Laboratory equipment and office furniture	3 years
Leasehold improvement	Shorter of life of asset or lease term

Leases

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

Impairment of Long-Lived Assets

Long-lived assets, such as property and equipment, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated undiscounted future cash flows, an impairment charge is recognized as the amount by which the carrying amount of the asset exceeds the estimated fair value of the asset. As of December 31, 2020 and 2019, no revision to the remaining useful lives or write-down of long-lived assets was required.

Income Taxes

Income taxes are accounted for under the liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to the differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and the operating loss and tax credit carryforwards. Valuation allowances are established when necessary to reduce deferred tax assets to the

amount expected to be realized. Deferred tax assets and liabilities are measured at the balance sheet date using the enacted 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 on deferred tax assets and liabilities of a change in tax rates is recognized in the period such tax rate changes are enacted.

Revenue Recognition

On January 1, 2019, the Company adopted Accounting Standards Update, or ASU, 2014-09, Revenue from Contracts with Customers (Topic 606), and subsequent amendments, using the modified retrospective transition method applied to those contracts that were not completed as of January 1, 2019. As a result, the Company recorded an increase of $6.2 million in each of its accumulated deficit and contract liabilities balances on January 1, 2019. Results for operating periods beginning after January 1, 2019 are presented under ASC 606, while amounts prior to 2019 have not been adjusted and may not be comparable.

ASC 606 requires an entity to recognize revenue upon the transfer of goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The Company applies the following five-step revenue recognition model outlined in ASC 606 to adhere to this core principle: (1) identify the contract(s) with a customer; (2) identify the performance obligations in the contract; (3) determine the transaction price; (4) allocate the transaction price to the performance obligations in the contract; and (5) recognize revenue when (or as) the Company satisfies a performance obligation.

The most significant change to the Company's policies upon the adoption of ASC 606 was the estimation of an arrangement's total transaction price, which includes unconstrained variable consideration, and the recognition of that transaction price based on a cost-based input method that requires estimates to determine, at each reporting period, the percentage of completion based on the estimated total effort required to complete the project and the total transaction price.

All of the Company's revenue to date has been generated from its collaboration agreements, primarily its collaboration agreement with Merck. The terms of these agreements generally require the Company to provide (i) license options for its compounds, (ii) research and development services and (iii) non-mandatory services in connection with participation in research or steering committees. Payments received under these arrangements may include non-refundable upfront license fees, partial or complete reimbursement of research and development costs, contingent consideration payments based on the achievement of defined collaboration objectives and royalties on sales of commercialized products. In some agreements, the collaboration partner is solely responsible for meeting defined objectives that trigger contingent or royalty payments. Often the partner only pursues such objectives subsequent to exercising an optional license on compounds identified as a result of the research and development services performed under the collaboration agreement.

The Company assesses whether the promises in its arrangements, including any options provided to the partner, are considered distinct performance obligations that should be accounted for separately. Judgment is required to determine whether the license to a compound is distinct from research and development services or participation in research or steering committees, as well as whether options create material rights in the contract.

The transaction price in each arrangement is generally comprised of a non-refundable upfront fee and unconstrained variable consideration related to the performance of research and development services. The Company typically submits a budget for the research and development services to the partner in advance of performing the services. The transaction price is allocated to the identified performance obligations based on the standalone selling price, or SSP, of each distinct performance obligation. Judgment is required to determine the SSP. In instances where the SSP is not directly observable, such as when a license or service is not sold separately, SSP is determined using information that may include market conditions and other observable inputs. The Company utilizes judgment to assess the nature of its performance obligations to determine whether they are satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress toward completion. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition.

The Company's collaboration agreements may include contingent payments related to specified development and regulatory milestones or contingent payments for royalties based on sales of a commercialized product. Milestones can be achieved for such activities in connection with progress in clinical trials, regulatory filings in various geographical markets and marketing approvals from regulatory authorities. Sales-based royalties are generally related to the volume of annual sales of a commercialized product. At the inception of each agreement that includes such payments, the Company evaluates whether the milestones are considered probable of being achieved and estimates the amount to be included in the transaction price by 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 Company's or its partner's

control, such as those related to regulatory approvals, are not considered probable of being achieved until those approvals are received. The transaction price is then allocated to each performance obligation based on a relative SSP basis. At the end of each subsequent reporting period, the Company re-evaluates the probability of achievement of each such milestone and any related constraint and, if necessary, adjusts its estimate of the overall transaction price. Pursuant to the guidance in ASC 606, sales-based royalties are not included in the transaction price. Instead, royalties are recognized at the later of when the performance obligation is satisfied or partially satisfied, or when the sale that gives rise to the royalty occurs.

Research and Development

Research and development costs are expensed as incurred. Research and development expenses primarily include salaries and benefits for medical, clinical, quality, preclinical, manufacturing and research personnel, costs related to research activities, preclinical studies, clinical trials, drug manufacturing expenses and allocated overhead and facility occupancy costs. The Company accounts for non-refundable advance payments for goods or services that will be used in future research and development activities as expenses when the goods have been received or when the service has been performed rather than when the payment is made.

Clinical trial costs are a component of research and development expenses. The Company expenses costs for its clinical trial activities performed by third parties, including clinical research organizations, or CROs, and other service providers, as they are incurred, based upon estimates of the work completed over the life of the individual study in accordance with associated agreements. The Company uses assessments by internal personnel and information it receives from outside service providers to estimate the clinical trial costs incurred.

Stock-Based Compensation

The Company's stock-based compensation programs include stock option grants, as well as shares issued under its 2019 Employee Stock Purchase Plan, or ESPP. Grants are awarded to employees, directors and nonemployees. The Company measures employee and director stock-based compensation expense for all stock-based awards at the grant date based on the fair value measurement of the award. Subsequent to the adoption of ASU No. 2018-07, Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting on January 1, 2019, stock-based compensation expense for non-employee awards is measured based on the fair value on the date of adoption. The expense is recorded on a straight-line basis over the requisite service period, which is generally the vesting period, for the entire award. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures materially differ from estimates. The Company calculates the fair value measurement of stock options using the Black-Scholes option-pricing model.

Foreign Currency Transactions

The functional currency of NGM Biopharmaceuticals Australia Pty Ltd., the Company's wholly-owned subsidiary, is the U.S. dollar. Accordingly, all monetary assets and liabilities of the subsidiary are remeasured into U.S. dollars at the current period-end exchange rates and non-monetary assets are remeasured using historical exchange rates. Income and expense elements are remeasured to U.S. dollars using the average exchange rates in effect during the period. Remeasurement gains and losses are recorded as other income (expense), net on the consolidated statements of operations.

The Company is subject to foreign currency risk with respect to its clinical and manufacturing contracts denominated in currencies other than the U.S. dollar, primarily British Pounds, Swiss Francs, Australian dollars and the Euro. Payments on contracts denominated in foreign currencies are made at the spot rate on the day of payment. Changes in the exchange rate between billing dates and payment dates are recorded within other income (expense), net, on the consolidated statements of operations.

Comprehensive Loss

Comprehensive loss is composed of net loss and certain changes in stockholders' equity (deficit) that are excluded from net loss, primarily unrealized gains or losses, net of taxes, on the Company's marketable securities.

Net Loss per Share

Basic net loss per share is calculated by dividing net loss by the weighted average number of shares outstanding during the period, less shares subject to repurchase and excludes any dilutive effects of stock-based

options and awards. Diluted net income per ordinary share is computed by giving effect to all potentially dilutive shares, including common stock issuable upon exercise of stock options. However, where there is a diluted net loss per ordinary share, no adjustment is made for potentially issuable shares since their effect would be anti-dilutive. In this case, diluted net loss per share is equal to basic net loss per share.

Net loss per share were computed as follows (in thousands, except share and per share amounts):

	Year Ended December 31,		
	2020	2019	2018
Numerator:			
Net loss	$ (102,487)	$ (42,795)	$ (493)
Denominator:			
Weighted average number of shares used in calculating net loss per share—basic and diluted	68,475,378	50,297,524	6,383,751
Net loss per share—basic and diluted	$ (1.50)	$ (0.85)	$ (0.08)

Potentially dilutive securities that were not included in the diluted per share calculations because they would be anti-dilutive were as follows:

	Year Ended December 31,		
	2020	2019	2018
Convertible preferred stock	—	—	47,267,466
Options to purchase common stock	10,017,918	10,824,780	9,806,689
Shares committed under ESPP	291,992	396,682	-
Warrants to purchase convertible preferred stock	—	—	19,637
Total	10,309,910	11,221,462	57,093,792

Segment and Geographical Information

The Company operates in one segment. Substantially all of the Company's long-lived assets, primarily comprised of property and equipment, are based in the U.S. For the years ended December 31, 2020, 2019 and 2018, the Company's revenues were entirely within the U.S.

Recent Accounting Pronouncements

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

Recently Adopted Accounting Pronouncements

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurements (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement, as part of the FASB's disclosure framework project. ASU 2018-13 modifies the disclosure requirements on fair value measurements in Topic 820, Fair Value Measurements by removing the requirement to disclose amounts of and reasons for transfers between Level 1 and Level 2 of the fair value hierarchy, the policy for timing of transfers between levels and the valuation process for Level 3 fair value measurements. ASU 2018-13 also modifies existing disclosure requirements by clarifying that the measurement uncertainty disclosure is to communicate information about the uncertainty in measurement as of the reporting date, and adds required disclosures for the changes in unrealized gains and losses for the period included in other comprehensive income for recurring Level 3 fair value measurements held at the end of the reporting period and the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements. The Company adopted ASU 2018-13

effective January 1, 2020, noting no material impact on the Company's results of operations and financial position.

Recent Accounting Pronouncements Not Yet Adopted

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), which increases lease transparency and comparability among organizations. Under the new standard, lessees will be required to recognize right-of-use, or ROU, assets and lease liabilities arising from lease arrangements on the consolidated balance sheets, with the exception of leases with a term of twelve months or less, which permits a lessee to make an accounting policy election by class of underlying asset not to recognize the ROU assets and lease liabilities. In March 2018, the FASB approved an alternative transition method to the modified retrospective approach, which eliminates the requirement to restate prior period financial statements and allows the cumulative effect of the retrospective allocation to be recorded as an adjustment to the opening balance of retained earnings at the date of adoption. In November 2019, the FASB issued ASU 2019-10, which deferred the effective date for certain ASUs including ASU 2016-02. In June 2020, due to the evolving impacts of the COVID-19 pandemic, the FASB issued ASU 2020-05, which further defers the effective date of ASU 2016-02 which is now effective for the Company's fiscal year beginning after December 15, 2021, and interim periods within fiscal years beginning after December 15, 2022.

The Company plans to adopt the new lease standard in the fiscal year beginning January 1, 2022, using the optional transition method, which allows the Company to recognize a cumulative-effect adjustment to the opening balance of accumulated deficit at the date of adoption and apply the new disclosure requirements beginning in the period of adoption. The Company also plans to elect the package of practical expedients permitted under the transition guidance within the new standard, which, among other things, allows the Company to carryforward the historical lease classification and make an accounting policy election whereby ROU assets and lease liabilities associated with lease arrangements with terms less than one year will not be recognized. The Company continues to evaluate the impact of this new lease standard to its results of operations and financial position.

In November 2018, the FASB issued ASU 2018-18, Collaborative Arrangements (ASC 808): Clarifying the Interaction between ASC 808 and ASC 606, which clarifies that certain transactions between collaborative arrangement participants should be accounted for as revenue under ASC 606 when the collaborative arrangement participant is a customer in the context of a unit of account. In those situations, all the guidance in ASC 606 should be applied, including recognition, measurement and presentation and disclosure requirements. ASU 2018-18 adds unit-of-account guidance in ASC 808 to align with the guidance in ASC 606 (that is, a distinct good or service) when an entity is assessing whether the collaborative arrangement or a part of the arrangement is within the scope of ASC 606, and requires that in a transaction with a collaborative arrangement participant that is not directly related to sales to third parties, presenting the transaction together with revenue recognized under ASC 606 is precluded if the collaborative arrangement participant is not a customer. ASU 2018-18 will be effective for the Company's fiscal year beginning after December 15, 2020, and interim periods within fiscal years beginning after December 15, 2021. The Company is currently assessing the timing of adoption and the impact that the adoption of ASU 2018-18 will have on its results of operations and financial position.

In December 2019, the FASB issued ASU 2019-12, Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes. The new guidance modifies ASC 740 to simplify several aspects of accounting for income taxes, including eliminating certain exceptions to the guidance in ASC 740 related to the approach for intraperiod tax allocation. ASU 2019-12 will be effective for the Company for its fiscal year beginning after December 15, 2021, and interim periods within fiscal years beginning after December 15, 2022, and is required to be adopted prospectively, with the exception of certain specific amendments. The Company is currently assessing the timing of adoption and the impact that the adoption of ASU 2019-12 will have on its results of operations and financial position.

3. Fair Value Measurements

Cash and cash equivalents and marketable securities, all of which are classified as available-for-sale securities, consisted of the following (in thousands):

	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
As of December 31, 2020				
Money market funds	$ 137,658	$ —	$ —	$ 137,658
U.S. government agencies securities	98,647	9	(3)	98,653
Commercial paper	41,945	—	—	41,945
Corporate and agency bonds	7,543	—	(2)	7,541
Totals	$ 285,793	$ 9	$ (5)	$ 285,797
Classified as:				
Cash and cash equivalents				$ 137,658
Short-term marketable securities (amortized cost of $148,135)				148,139
Total				$ 285,797

	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
As of December 31, 2019				
Money market funds	$ 244,973	$ —	$ —	$ 244,973
Corporate and agency bonds	66,063	28	(14)	66,077
Commercial paper	24,840	—	—	24,840
U.S. government agencies securities	7,985	11	—	7,996
Totals	$ 343,861	$ 39	$ (14)	$ 343,886
Classified as:				
Cash and cash equivalents				$ 244,973
Short-term marketable securities (amortized cost of $98,888)				98,913
Total				$ 343,886

Cash and cash equivalents in the table above excludes cash on deposit with banks of $9.4 million and $0.6 million as of December 31, 2020 and 2019, respectively.

To date, the Company has not recorded any impairment charges against the market value of its marketable securities. In determining whether a decline is other than temporary, the Company considers various factors including the length of time and extent to which the market value has been less than cost, the financial condition and near-term prospects of the issuer and the Company's intent and ability to retain its investment in the issuer for a period of time sufficient to allow for any anticipated recovery in market value.

As of December 31, 2020 and 2019, the Company’s marketable securities had remaining contractual maturities of less than one year. As of December 31, 2020, there was one marketable security in an unrealized loss position compared to four marketable securities in unrealized loss positions as of December 31, 2019. Marketable securities that had been in unrealized loss positions as of December 31, 2020 and 2019 had been in an unrealized loss position for less than 12 months. The Company does not intend to sell marketable securities that are in an unrealized loss position and it is highly unlikely that the Company will be required to sell the investments before recovery of their amortized cost basis, which may be maturity.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following table summarizes, by major security type, our available-for-sale securities that were measured at fair value on a recurring basis and were categorized using the fair value hierarchy (in thousands):

	Fair Value Measurements			
As of December 31, 2020	**Level 1**	**Level 2**	**Level 3**	**Total**
Assets:				
Money market funds	$ 137,658	$ —	$ —	$ 137,658
U.S. government agencies securities	—	98,653	—	98,653
Commercial paper	—	41,945	—	41,945
Corporate and agency bonds	—	7,541	—	7,541
Totals	$ 137,658	$ 148,139	$ —	$ 285,797

	Fair Value Measurements			
As of December 31, 2019	**Level 1**	**Level 2**	**Level 3**	**Total**
Assets:				
Money market funds	$ 244,973	$ —	$ —	$ 244,973
Corporate and agency bonds	—	66,077	—	66,077
Commercial paper	—	24,840	—	24,840
U.S. government agencies securities	—	7,996	—	7,996
Totals	$ 244,973	$ 98,913	$ —	$ 343,886

The carrying amounts of cash and cash equivalents, the related party receivable and contract asset from collaboration and other current assets and liabilities approximate their respective fair values due to their short-term nature.

The Company estimates the fair values of investments in corporate agency bond securities, commercial paper and government agencies securities using Level 2 inputs by taking into consideration valuations obtained from third-party pricing services.

There were no transfers of assets or liabilities between the fair value measurement levels during the years ended December 31, 2020 and 2019.

4. Balance Sheet Components

Cash and Restricted Cash

A reconciliation of cash, cash equivalents and restricted cash reported within the consolidated balance sheets to the amount reported within the consolidated statements of cash flows is as follows (in thousands):

	December 31,	
	2020	**2019**
Cash and cash equivalents	$ 147,017	$ 245,598
Restricted cash	1,499	1,874
Total cash, cash equivalents and restricted cash	$ 148,516	$ 247,472

Property and Equipment

Property and equipment consisted of the following (in thousands):

	December 31,	
	2020	2019
Leasehold improvements	$ 25,880	$ 25,880
Laboratory equipment and office furniture	23,638	21,652
Computer equipment	1,271	1,201
Construction-in-progress	48	498
Total property and equipment, gross	50,837	49,231
Less: accumulated depreciation and amortization	(36,311)	(29,756)
Total property and equipment, net	$ 14,526	$ 19,475

Depreciation expense for the years ended December 31, 2020, 2019 and 2018 was approximately $6.6 million, $7.6 million and $7.2 million, respectively.

Accrued Liabilities

Accrued liabilities consisted of the following (in thousands):

	December 31,	
	2020	2019
Clinical trials and research and development costs	$ 9,316	$ 11,051
Manufacturing costs	8,297	2,593
Personnel-related costs	8,921	6,446
Accrued expenses	3,411	2,901
Total accrued liabilities	$ 29,945	$ 22,991

The Company currently uses third-party contract development and manufacturing organizations or contract manufacturing organizations, which the Company refers to collectively as CMOs, to manufacture and supply all of the raw materials, drug substances and drug products for the Company's research and development programs, including all the clinical trial materials used in the clinical trials of our clinical-stage product candidates. To date, aldafermin and the Company's other product candidates have been manufactured by third-party manufacturers solely for preclinical studies and relatively small clinical trials.

5. Research Collaboration and License Agreements

Merck

In 2015, the Company entered into a collaboration agreement with Merck, or the Collaboration Agreement, covering the discovery, development and commercialization of novel therapies across a range of therapeutic areas, including a broad, multi-year drug discovery and early development program financially supported by Merck, but scientifically directed by the Company with input from Merck. In exchange for certain rights and access to the Company's drug discovery approach, in April 2015, Merck paid the Company an upfront cash licensing fee of $94.0 million and purchased approximately $106.0 million of the Company's Series E convertible preferred stock. The Company considered the ASC 606 criteria for combining contracts and determined that the Collaboration Agreement and stock purchase agreement should be combined into a single contract. The Company accounted for the combined agreement based on the fair values of the assets and services exchanged, resulting in $106.0 million allocated to the equity component and $94.0 million allocated to the revenue components.

The Collaboration Agreement contemplated an initial five-year research term, and Merck was granted the unilateral right to extend the research phase of the collaboration for two additional two-year terms. Each extension is considered to be and is accounted for as a separate arrangement, if and when the option is exercised by Merck. Under the terms of the Collaboration Agreement, Merck is required to pay a $20.0 million extension fee each time it elects to exercise its unilateral right to extend the research phase of the collaboration for an additional two-year term. In March 2019, Merck exercised its first option to extend the research phase of the collaboration for two additional years through March 16, 2022. Under the Collaboration Agreement, if and when Merck elects to extend the research phase for an additional two years, the level of funding that Merck will provide to the Company during such extension will be negotiated at the time of the extension, subject to certain minimum and maximum funding limits based on a percentage of the then-existing funding. As part of the two-year extension through March 16, 2022, Merck agreed to continue to fund the Company's research and development efforts up to $75.0 million each year consistent with the initial five-year term and, in lieu of a $20.0 million extension fee that would have otherwise been payable to the Company, Merck agreed to make additional payments totaling up to $20.0 million in support of the Company's research and development program activities during 2021 and in the first quarter of 2022.

Under the terms of the collaboration, Merck was required to notify the Company no later than March 17, 2021 of its unilateral decision whether to exercise its option to extend the research phase of the collaboration for an additional two-year term through March 16, 2024. In March 2021, Merck initiated discussions with the Company with respect to elements of the ongoing collaboration that might be optimized to better address the evolving interests and priorities of both the Company and Merck during the remainder of the current research phase through March 16, 2022 and during any extension of the current research phase and any tail period (which tail period is discussed below). In order to allow negotiations to proceed, the parties have agreed to extend the March 17, 2021 deadline for Merck to deliver its extension notification decision until June 30, 2021. See Note 10 for additional information.

The Company has determined the scientific direction and areas of therapeutic interest, with input from Merck, and is primarily responsible for the conduct of all research, preclinical and early clinical development activities, through human proof-of-concept trials. The Company has made the final determinations as to which compounds to advance into and through initial clinical trials and which to progress into a human proof-of-concept trial and the design of any such trials, with input from Merck through various governance committees.

Upon completion of a human proof-of-concept study for a particular product candidate, regardless of the results of such study, Merck has the one-time option to obtain an exclusive, worldwide license, on specified terms, to that product candidate, as well as to all other molecules that are directed against the same target and that result in the same effect on such target, collectively referred to as a Merck Licensed Program. For each program that Merck licenses, Merck must pay the Company a one-time fee of $20.0 million. If Merck exercises its license option, Merck is responsible, at its own cost, for any further development and any commercialization activities for compounds within the applicable Merck Licensed Program, subject to the Company's options to cost and profit share worldwide, and to co-detail those compounds in the United States. Where the Company exercises such an option, the compound is referred to as an NGM Optioned Product. If the Company elects to enter into a cost and profit share on an NGM Optioned Product, Merck has agreed to advance to the Company and/or assume up to 25% of the Company's share of the global development costs, subject to an aggregate cap over the course of the collaboration. All amounts advanced or assumed accrue interest and would be recouped by Merck in full out of the Company's share of any profits resulting from sales of the NGM Optioned Product before the Company is entitled to receive any of those profits. If the Company does not elect to enter into a cost and profit-sharing arrangement for a compound it has licensed to Merck, the Company is eligible to receive an aggregate of up to $449.0 million in pre-commercial milestone payments upon the achievement of specific clinical development and regulatory events with respect to the licensed compound for the first three indications in the United States, European Union, or EU, and Japan. The Company is also eligible to receive commercial milestone payments of up to $125.0 million and to receive royalties at ascending low-double digit to mid-teen percentage rates, depending on the level of net sales Merck achieves worldwide for each licensed compound.

Under the Collaboration Agreement, the Company also granted Merck a worldwide, exclusive right to conduct research and development on, and to manufacture, use and commercialize, small molecule compounds identified or developed by Merck that have specified activity against any target that the Company is researching or developing under the research phase of the collaboration and that, but for use of the Company's confidential and proprietary information, Merck would not have discovered. If Merck ultimately does not exercise its license option to a collaboration compound the Company has taken through a human proof-of-concept study that is directed to any such target, Merck's research license for its own small molecule program with respect to such target will become non-exclusive, but it will retain an exclusive license to any small molecule compounds that it has, as of that time, identified and developed. Merck has sole responsibility for research and development of any

of these small molecule compounds, at its own cost. The Company is eligible to receive milestone and royalty payments on small molecule compounds that are developed by Merck under such a license from the Company, in some cases at the same rates as those the Company is eligible to receive from Merck for a Merck Licensed Program originating from the Company's own research and development efforts, provided that, but for use of the Company's confidential and proprietary information, Merck would not have discovered such small molecule compounds. However, the Company will not have the option to cost and profit share or the option to co-detail those small molecule products.

During the three-month period before the end of the research phase, Merck has the right to review the Company's then-existing programs and to elect to designate one or more such programs for which the Company will be required to continue to conduct research and development for up to three years, referred to as the tail period. Merck will pay all of the Company's internal and external costs for its work on such Merck-designated programs, up to certain funding caps that decrease over the tail period and are each a specified percentage of certain funding actually provided to the Company by Merck during the last 12 months of the research phase. Merck also has the right to take over such Merck-designated programs and conduct such research and development activities itself or in partnership with a third party, at its own cost, or to terminate the tail period after a specified notice period. If Merck terminates the tail period, it has the right to elect to transition to itself or a third-party partner, at its own cost, any clinical trials that are then being conducted in such Merck-designated programs. If the Company completes a human proof-of-concept trial in one of such Merck-designated programs during the tail period or if Merck or its third-party partner completes a human proof-of-concept trial in one of such Merck-designated programs during or after the tail period, then Merck will have a one-time right to exercise its option to an exclusive, worldwide license for the collaboration product candidate tested in the proof-of-concept trial and certain related molecules in that program. Merck will lose its option rights at the end of the tail period with respect to all programs for which no collaboration product candidate has completed a human proof-of-concept trial by such time, except for Merck-designated programs that Merck is continuing to use commercially reasonable efforts to research and develop.

The Company evaluated the Collaboration Agreement with Merck under ASC 606. The Company identified the following promised goods or services at the inception of the Collaboration Agreement: (i) license to GDF15 receptor agonist program; (ii) license to pursue research and development and commercialization of small molecule compounds; (iii) performance of research and development services for five years; (iv) two options to extend performance of the research and development services, each for two additional years; and (v) options to obtain licenses to additional compounds after proof-of-concept trials. The Company determined the GDF15 receptor agonist program license and small molecule program license are not distinct from the research and development services, resulting in these items being combined into a single performance obligation.

The Company considered whether the options created material rights in the contract and concluded that the fee attached to the exercise of such options approximated the SSP of the promised goods or services included in the options. Therefore, the options do not give rise to material rights, are not performance obligations in the Collaboration Agreement and, if and when exercised, will be accounted for as separate arrangements under ASC 606.

Additionally, if a separate arrangement is created by the exercise of an option, such amounts would then be contingent on events outside of either party's control, such as products proving to be commercially viable and governmental agencies granting regulatory approval. Such contingencies and uncertainties result in the amounts being constrained and withheld from inclusion in the estimated transaction price of a separate arrangement. Consequently, the estimated transaction price related to the Collaboration Agreement is comprised of the up-front payment and the ongoing research and development reimbursements.

Any fees associated with options, including upfront fees, funding fees and milestones, are not included in the transaction price as they are associated with options that are not material rights and, thus, are not performance obligations within the Collaboration Agreement. For example, in November 2018, Merck exercised its option for a license to further research and develop MK-3655 and other FGFR1c/KLB agonists and paid the Company a $20.0 million fee. The $20.0 million license fee for MK-3655 was not included in the transaction price and was instead recognized in the period of exercise in the fourth quarter of 2018 as the Company had no further obligation related to that license. The Phase 3 clinical study for MK-3655 has not begun, and the Company has not made an election as to whether it will participate in the cost and profit share or receive milestone and royalty payments. The amounts do not impact the estimated transaction price associated with the single performance obligation identified in the Collaboration Agreement.

The transaction price associated with the initial five-year term of the Collaboration Agreement consisted of the $94.0 million upfront fee and the funding amounts of up to $75.0 million per year for each of the first five

years of the Collaboration Agreement. No milestones or other forms of consideration were included in the transaction price as those amounts are contingent upon Merck exercising an option for licenses on additional compounds and would, therefore, be pursuant to separate arrangements and were not part of the Collaboration Agreement estimated transaction price. As there was only one performance obligation in the Collaboration Agreement, the transaction price was allocated entirely to that performance obligation.

At the end of the initial five-year term of the Collaboration Agreement, the remaining contract liability amount of $4.9 million related to the upfront license fee included within the transaction price as of December 31, 2019 was fully earned and recognized during the three months ended March 31, 2020. The Company has fully recognized revenue of approximately $388.1 million related to the single performance obligation associated with the initial five-year term of the Collaboration Agreement.

Upon Merck exercising its option to extend the research phase of the collaboration through March 16, 2022, the Company deemed that a separate arrangement containing a distinct two-year performance obligation to provide distinct research and development services was created on March 17, 2020 in accordance with ASC 606. The transaction price of $170.0 million for this two-year performance obligation consists of the potential funding amounts of up to $75.0 million per year plus the additional funding amount of $20.0 million to be made during 2021 and in the first quarter of 2022 if the Company exceeds the $75.0 million funding cap. The Company also uses a cost-based input method to calculate the corresponding amount of revenue to recognize. In applying the cost-based input measure of revenue recognition, the Company measures actual costs incurred relative to budgeted costs to fulfill this distinct two-year performance obligation. These costs consist of full-time equivalent hours plus allowable external (third-party) costs incurred. Revenue is recognized based on actual costs incurred as a percentage of total budgeted costs as the Company completes its performance obligation applied to the transaction price. The Company re-evaluates the estimate of expected costs to satisfy the performance obligation each reporting period and makes adjustments for any significant changes. In addition, the Company also considers any necessary adjustments in an effort to ensure that the transaction price is within the range of potential funding amounts as described above. As such, management applies considerable judgment in estimating expected costs as such costs are key inputs when applying the cost-based input method. As the Company's estimated measure of progress is updated at each reporting period and revenue is recognized on a cumulative catch-up basis, a significant change in the estimate of expected costs for the remainder of the contract term could have a material impact on revenue recognized (including the possible reversal of previously recognized revenue) at each reporting period, as well as the related impact on contract assets and liabilities.

Since the transaction price includes an additional funding amount of $20.0 million to be made during 2021 and in the first quarter of 2022, the timing of when the revenue is recognized for this additional funding amount for performance of the services and when this additional funding amount can be billed resulted in the recognition of a related party contract asset, at December 31, 2020, of $6.1 million. As of December 31, 2019, the Company reported contract liabilities related to the single performance obligation in the Collaboration Agreement of $4.9 million. Of the amount recognized for the adoption of ASC 606 in the reporting period ended December 31, 2019, $6.2 million was included in contract liabilities at the end of the prior reporting period.

In connection with the Series E convertible preferred stock purchase agreement, the Company and Merck entered into an agreement whereby Merck agreed to purchase 4,121,683 shares of the Company's common stock in a separate private placement concurrent with the completion of the Company's IPO at a price per share equal to the public offering price of $16.00, resulting in Merck owning approximately 19.9% of the Company's outstanding shares of common stock following the completion of the IPO.

A breakout of the milestone payments in connection with the potential achievement of certain clinical development events is as follows (in thousands):

	First Indication	Second Indication	Third Indication
Upon administration of an applicable product to the first patient in the first Phase 3 clinical trial for such product for the given indication	$ 35,000	$ 25,250	$ 17,500

A breakout of the milestone payments in connection with the potential achievement of various regulatory events for each of the three indications, for each of the three geographic areas, is as follows (in thousands):

	First Indication	Second Indication	Third Indication	Total
United States	$ 75,000	$ 56,250	$ 37,500	$ 168,750
European Union	60,000	45,000	30,000	135,000
Japan	30,000	22,500	15,000	67,500
	$ 165,000	$ 123,750	$ 82,500	$ 371,250

Summary of Collaboration Revenue

The Company recognized revenue from its collaboration and license agreements as follows (in thousands):

	Year Ended December 31,		
	2020	2019	2018
Related party revenue	$ 87,368	$ 103,544	$ 108,665

For the year ended December 31, 2020, the Company recognized collaboration and license revenue under the Collaboration Agreement of $87.4 million primarily related to reimbursable research and development activities, including $61.8 million associated with the performance obligation for the two-year extension period, and $4.9 million related to collaboration and license revenue earned under the initial five-year term that ended in March 2020. Revenue recognized related to the reimbursable research and development activities were recognized using the cost-based input model related to research and development activities.

For the year ended December 31, 2019, the Company recognized collaboration and license revenue under the Collaboration Agreement of $103.5 million, of which $24.0 million was recognized from the upfront license fee by applying the cost-based input measure of revenue recognition in accordance with ASC 606 and the remaining balance related to research and development activities.

For the year ended December 31, 2018, the Company recognized collaboration and license revenue under the Collaboration Agreement of $108.7 million, which was comprised of $18.8 million of amortized upfront payments, $20.0 million related to the licensing of MK-3655 and the remaining balance related to research and develop activities reimbursed by Merck provided under the Collaboration Agreement.

Related Party Contract Assets and Liabilities

Amounts received prior to satisfying the revenue recognition criteria are recorded as contract liabilities in the Company's consolidated balance sheets. If the related performance obligation is expected to be satisfied within the next twelve months, the contract liability will be classified in current liabilities. Amounts recognized as revenue prior to the Company having an unconditional right (other than a right that is conditioned only on the passage of time) to receipt are recorded as contract assets in the Company's consolidated balance sheets. If the Company expects to have an unconditional right to receive the consideration in the next twelve months, the contract asset will be classified in current assets.

Changes in contract liabilities were as follows (in thousands):

	Amounts
Balance at December 31, 2018	$ 22,967
Adoption of ASC 606	6,156
Balance at January 1, 2019	29,123
Revenue recognized included in the contract liability balance at the beginning of the period	(24,251)
Balance at December 31, 2019	4,872
Revenue recognized through March 16, 2020	(4,872)
Balance at December 31, 2020	$ -

As of December 31, 2020, the Company recorded a related party contract asset of $6.1 million related to the portion of revenue recognized prior to having an unconditional right to receipt under the Company's Collaboration Agreement with Merck.

6. Commitments and Contingencies

Operating Lease

In December 2015, the Company entered into an operating lease for its corporate office space and laboratory facility at 333 Oyster Point Blvd, South San Francisco, California for approximately 122,000 square feet that expires in December 2023. The lease provided a tenant improvement allowance of $15.2 million that the Company used in 2016 towards $22.3 million in total leasehold improvements that are amortized over the lease term of seven years. The 333 Oyster Point lease agreement required a letter of credit in the amount of $2.3 million as a security deposit to the lease, which the Company has recorded as non-current restricted cash on the consolidated balance sheets. The Company has the right to reduce the letter of credit amount by $0.4 million on each of the third anniversary and fourth anniversary of the rent commencement date. For the year ended December 31, 2020, the Company reduced its letter of credit by $0.4 million and reclassified that amount from restricted cash to cash and cash equivalents on the consolidated balance sheets.

In September 2009, the Company entered into an operating lease for a corporate office space and laboratory facility at 630 Gateway Blvd, in South San Francisco, California for approximately 50,000 square feet, as amended in June 2014. In July 2016, the Company assigned the operating lease of 630 Gateway to Merck, as part of the Company's relocation to 333 Oyster Point. The operating lease expired in November 2020. Following expiration of the operating lease, the Company retains the obligation to indemnify the landlord and Merck under certain limited circumstances, but has no further payment obligations.

The Company recognizes rent expense on a straight-line basis over the lease period with the difference recorded as deferred rent. In addition, tenant improvement allowances recorded are amortized as a reduction to rent expense on a straight-line basis over the lease term. Rent expense under these facility operating leases was approximately $2.2 million for the years ended December 31, 2020, 2019 and 2018, respectively.

Future minimum payments under the unassigned lease obligations described above are as follows as of December 31, 2020 (in thousands):

Year Ended December 31,		
2021	$	5,141
2022		5,294
2023		5,455
Total	$	15,890

Indemnification

In the normal course of business, the Company enters into contracts and agreements that contain a variety of representations and warranties and may provide for indemnification of the counterparty. The Company's exposure under these agreements is unknown because it involves claims that may be made against it in the future but have not yet been made.

In accordance with the Company's amended and restated certificate of incorporation and its amended and restated bylaws, the Company has indemnification obligations to its officers and directors, subject to some limits, with respect to their service in such capacities. The Company has also entered into indemnification agreements with its directors and certain of its officers. To date, the Company has not been subject to any claims, and it maintains director and officer insurance that may enable it to recover a portion of any amounts paid for future potential claims.

The Company's exposure under these agreements is unknown because it involves claims that may be made against it in the future but have not yet been made. The Company believes that the fair value of these indemnification obligations is minimal and, accordingly, it has not recognized any liabilities relating to these obligations for any period presented.

7. Stockholders' Equity

Preferred Stock

The Company has 10,000,000 shares of preferred stock authorized, which may be issued at the discretion of the Company's board of directors. The board of directors may issue shares of preferred stock in one or more series and to fix the number, rights, preferences, privileges and restrictions. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, terms of redemption, liquidation preferences and sinking fund terms. As of December 31, 2020, the Company does not have any shares of preferred stock issued or outstanding.

Common Stock

As of December 31, 2020 and 2019, the Company had 70,585,364 and 66,960,279 shares of common stock outstanding, respectively, which included shares subject to repurchase of 6,508 and 74,454, respectively, as a result of early exercise of stock options not yet vested.

The Company had reserved the following shares of common stock for issuance:

	December 31,	
	2020	2019
Reserve balance for Sales Agreement	14,190,300	-
Common stock options outstanding	10,017,918	10,824,780
Common stock options available for grant	6,186,497	5,316,066
ESPP shares available for purchase	700,074	897,255
401(k) matching plan	21,930	28,274
Total	31,116,719	17,066,375

Open Market Sale Agreement

In June 2020, the Company entered into the Sales Agreement with Jefferies relating to the sale of shares of its common stock. In accordance with the terms of the Sales Agreement, the Company may offer and sell shares of its common stock having an aggregate offering price of up to $150.0 million from time to time through Jefferies acting as its sales agent.

In December 2020, under the Sales Agreement, the Company sold 809,700 shares of its common stock at an average price of $27.94 per share for net proceeds of $21.9 million, after deducting $0.7 million in sales commissions. In with connection with the transaction, the Company reclassified $0.6 million in deferred offering cost from other assets to equity. As of December 31, 2020, $127.4 million of the Company's common stock remained available to be sold under the Sales Agreement, subject to certain conditions as specified in the Sales Agreement.

Stock Option Plan

In 2018, the Company adopted the 2018 Equity Incentive Plan, or 2018 Plan, for eligible employees, officers, directors, advisors and consultants, which provides for the grant of incentive and non-statutory stock options, restricted stock awards and stock appreciation rights. The terms of the stock option agreements, including vesting requirements, are determined by the board of directors, subject to the provisions of the 2018 Plan. Options granted by the Company generally vest within four years and are exercisable from the grant date until ten years after the date of grant. Vesting of certain employee options may be accelerated in the event of a change in control of the Company. As of December 31, 2020, 17,874,624 shares of common stock had been authorized for issuance under the 2018 Plan. Pursuant to the terms of the 2018 Plan, the number of shares reserved and available to issue will automatically increase on January 1st of each year in an amount equal to 4% of the total number of common shares outstanding on the December 31st immediately preceding calendar year, unless the board of directors elects to forego or reduce such increase. The Company's 2008 Equity Incentive Plan expired at the beginning of 2018.

Stock options are governed by stock option agreements between the Company and recipients of stock options. Prior to the closing of the Company's IPO, the board of directors exercised reasonable judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of the

Company's common stock, including the Company's stage of development; progress of its research and development efforts; the rights, preferences and privileges of its convertible preferred stock relative to those of its common stock; equity market conditions affecting comparable companies; and the lack of marketability of the Company's common stock. Subsequent to the IPO, the exercise price of each option may not be less than 100% of the fair market value of the common stock subject to the option on the date the option is granted. A 10% or greater stockholder may not be granted an incentive stock option unless the exercise price of such option is at least 110% of the fair value of the common stock on the date of grant and the option is not exercisable after the expiration of five years from the grant date. Options become exercisable and expire as determined by the Compensation Committee of the Company's board of directors, provided that the term of incentive stock options may not exceed ten years from the date of grant for options granted to those other than 10% stockholders.

2019 Employee Stock Purchase Plan

In March 2019, the Company adopted the ESPP. The Company reserved 1,000,000 shares of common stock pursuant to purchase rights granted to the Company's employees. The ESPP provides that the number of shares reserved and available for issuance will automatically increase on January 1 of each calendar year, beginning January 1, 2020, by the lesser of (1) 1.0% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year, (2) 1,000,000 shares or (3) a number determined by the Company's board of directors that is less than (1) and (2). Under the ESPP, eligible employees are granted options to purchase shares of the Company's common stock through payroll deductions that cannot exceed 15% of each employee's salary. The ESPP provides for a 24-month offering period, which includes four six-month purchase periods. At the end of each purchase period, eligible employees are permitted to purchase shares of common stock at the lower of 85% of fair market value at the beginning of the offering period or fair market value at the end of the purchase period. The 2019 ESPP is considered a compensatory plan and the Company has recorded stock-based compensation expense of $1.2 million and $1.0 million for the years ended December 31, 2020 and 2019, respectively. As of December 31, 2020, 299,926 shares of common stock had been purchased under the ESPP.

Stock Option Activity

A summary of the outstanding stock options is as follows:

		Outstanding Options			
	Options Available for Grant	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in Years)	Aggregate Intrinsic Value (in Thousands)
Balances at December 31, 2019	5,316,066	10,824,780	$ 7.52	6.29	$ 118,770
Additional shares reserved	2,678,411				
Options granted	(2,576,501)	2,576,501	17.62		
Options exercised	—	(2,614,842)	4.53		
Options cancelled	768,521	(768,521)	12.43		
Balances at December 31, 2020	6,186,497	10,017,918	$ 10.52	6.45	$ 198,097
Vested and expected to vest at December 31, 2020		9,872,681	$ 10.44	6.41	$ 196,065
Outstanding and exercisable at December 31, 2020		10,017,918	$ 10.52	6.45	$ 198,097

The aggregate intrinsic values of options outstanding, exercisable, vested and expected to vest were calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock.

Early Exercise of Stock Options

The 2018 Plan allows for the granting of options that may be exercised before the options have vested. Shares issued as a result of early exercise that have not vested are subject to repurchase by the Company upon termination of the purchaser's employment or services, at the price paid by the purchaser, and are not deemed to

be issued for accounting purposes until those related shares vest. The amounts received in exchange for these shares have been recorded as a liability on the consolidated balance sheets and will be reclassified into common stock and additional paid-in-capital as the shares vest. The Company's right to repurchase these shares generally lapses in equal installments over four years beginning from the original vesting commencement date.

As of December 31, 2020, there were 6,508 shares of common stock outstanding subject to the Company's right of repurchase at prices ranging from $7.70 to $8.14 per share. At December 31, 2019, there were 74,454 shares of common stock outstanding subject to the Company's right of repurchase at prices ranging from $7.64 to $8.14 per share. As of December 31, 2020 and 2019, the Company recorded $0.1 million and $0.6 million, respectively, as early exercise stock option liabilities associated with shares issued with repurchase rights.

Employee Stock-Based Compensation Expense

Employee and director stock-based compensation expense was calculated based on awards ultimately expected to vest and has been reduced for estimated forfeitures. The Company estimates forfeiture rates based on historical stock option grants and cancellations.

Stock-based compensation expense related to stock-based payment awards to employees and directors was allocated as follows (in thousands):

	Year Ended December 31,		
	2020	2019	2018
Research and development	$ 8,145	$ 7,145	$ 5,232
General and administrative	7,312	5,584	4,524
Total stock-based compensation expense	$ 15,457	$ 12,729	$ 9,756

Valuation Assumptions

The Company uses the Black-Scholes option-pricing model to estimate the fair value of stock options at the grant date. The Black-Scholes option-pricing model requires the Company to make certain estimates and assumptions, including assumptions related to the expected price volatility of the Company's stock, the period during which the options will be outstanding, the rate of return on risk-free investments and the expected dividend yield for the Company's stock.

The expected volatility is based on the historical volatility of the stock of similar entities within the Company's industry over periods commensurate with the Company's expected term assumption. The expected term of stock option grants represents the weighted-average period the options are expected to remain outstanding and is based on the "simplified" method where the expected term is the midpoint between the vesting date and the end of the contractual term for each option. The Company bases the risk-free interest rate on the interest rate payable on U.S. Treasury securities in effect at the time of grant for a period that is commensurate with the assumed expected option term. In reference to the expected dividend yield assumption, the Company has not historically paid, and does not expect for the foreseeable future to pay, a dividend.

The weighted average grant-date fair value of stock options granted during the years ended December 31, 2020, 2019 and 2018 was $10.86, $8.00 and $5.71 per share, respectively. The intrinsic value of stock options exercised was $40.9 million, $10.2 million and $1.9 million for the years ended December 31, 2020, 2019 and 2018, respectively. Due to the Company's net operating losses, the Company did not realize any tax benefits from stock-based payment arrangements for the year ended December 31, 2020, 2019 and 2018.

The fair value of stock option awards granted to employees and directors were estimated at the date of grant using a Black-Scholes option-pricing model with the following weighted average valuation assumptions:

	Year Ended December 31,		
	2020	2019	2018
Volatility	68%	65%	65%
Expected term (years)	6.23	6.18	5.98
Risk-free interest rate	1.04%	2.25%	2.59%
Expected dividend yield	—	—	—

As of December 31, 2020, total compensation cost not yet recognized related to unvested stock options granted to employees and directors was $29.6 million, which is expected to be recognized over a weighted-average period of 2.75 years.

Stock Options Granted to Certain Non-employees

The Company grants stock options to certain non-employees in exchange for services performed for the Company. The Company granted 67,500 and 22,500 options to non-employees for the years ended December 31, 2020 and 2019, respectively. For the year ended December 31, 2018, the Company did not grant any options to non-employees. Stock-based compensation expense related to stock-based payment awards to non-employees for the years ended December 31, 2020, 2019 and 2018 was $194,000, $133,000 and $103,000, respectively. As of December 31, 2020 and 2019, non-employee stock options to purchase 70,472 and 21,564 shares, respectively, remained unvested.

The fair value of stock option awards granted to non-employees was estimated at the date of grant using a Black-Scholes option-pricing model with the following weighted average valuation assumptions:

	Year Ended December 31,		
	2020	2019	2018
Volatility	70%	66%	—
Expected term (years)	6.02	6.00	—
Risk-free interest rate	0.41%	2.26%	—
Expected dividend yield	—	—	—

The fair value of the rights granted to employees under the ESPP was estimated at the date of offer using a Black-Scholes option-pricing model with the following weighted average valuation assumptions:

	Year Ended December 31,		
	2020	2019	2018
Volatility	74%	59%	—
Expected term (years)	1.17	1.23	—
Risk-free interest rate	0.15%	1.97%	—
Expected dividend yield	—	—	—

8. Employee Benefit Plan

The Company sponsors a 401(k) defined contribution plan for its employees. Employee contributions are voluntary. In December 2011, the Company adopted the 401(k) Matching Plan, under which the Company makes matching contributions in the form of common stock at a rate of $1.00 for each $2.00 of employee contributions up to a maximum $750 of common stock per employee per year. As of December 31, 2020 and 2019, the Company had reserved 21,930 and 28,274 shares of common stock for issuance pursuant to the 401(k) Matching Plan, respectively. Matching contributions of 6,344 and 8,477 shares, or $119,000 and $98,000, were issued for the years ended December 31, 2020 and 2019, respectively.

9. Income Taxes

The Company has reported pre-tax operating losses for all periods presented. The Company has not reflected any benefit for corresponding tax net operating loss carryforwards in the accompanying consolidated financial statements. The Company has established a full valuation allowance against its deferred tax assets due to the uncertainty surrounding the realization of such assets.

The components of the Company's losses before income taxes were as follows (in thousands):

	Year Ended December 31,		
	2020	2019	2018
Domestic	$ (102,209)	$ (34,634)	$ 5,502
Foreign	(278)	(8,161)	(5,995)
Total	$ (102,487)	$ (42,795)	$ (493)

A reconciliation of the statutory U.S. federal rate to the Company's effective tax rate is as follows:

	Year Ended December 31,		
	2020	2019	2018
U.S. federal tax at statutory rate	21.0 %	21.0 %	21.0 %
Foreign tax rate differential	0.0	1.7	109.5
State, net of federal benefit	(0.1)	0.0	(4.5)
Stock-based compensation	3.8	0.2	(93.1)
Change in valuation allowance	(25.0)	(23.2)	401.6
Other	0.3	0.2	(434.7)
Total	0.0 %	0.0 %	(0.2) %

The components of the net deferred tax assets are as follows (in thousands):

	December 31,	
	2020	2019
Deferred tax assets:		
Net operating loss carryforwards	$ 60,879	$ 37,679
Stock-based compensation	4,580	3,478
Research and development credit	2,918	2,918
Contract liabilities	—	1,026
Other temporary differences	2,079	1,217
Total gross deferred tax assets	70,456	46,318
Deferred tax liabilities:		
Depreciation and amortization	(389)	(570)
Non-qualified stock options with 83(b) election	(15)	(15)
Total gross deferred tax liabilities	(404)	(585)
Net deferred tax assets before valuation allowance	70,052	45,733
Deferred tax asset valuation allowance	(70,052)	(45,733)
Net deferred tax assets	$ —	$ —

ASC 740 requires that the tax benefit of net operating losses, temporary differences and credit carryforwards be recorded as an asset to the extent that management assesses that realization is "more likely than not." Realization of the future tax benefits is dependent on the Company's ability to generate sufficient taxable income within the carryforward period. Because of the Company's recent history of operating losses, management believes that recognition of the deferred tax assets arising from the above-mentioned future tax benefits is currently not more-likely-than-not to be realized and, accordingly, has provided a valuation allowance.

Realization of deferred tax assets is dependent upon future earnings, if any, the timing and amount of which are uncertain. Accordingly, the net deferred tax assets have been fully offset by a valuation allowance. The valuation allowance increased by approximately $24.3 million and $9.5 million during the years ended December 31, 2020 and 2019, respectively.

As of December 31, 2020, the Company had approximately $226.8 million in federal net operating loss carryforwards to reduce future taxable income. Of this amount, $161.4 million was generated after December 31, 2017 and does not expire per the Tax Cuts and JOBS Act, or the 2017 Tax Act, and can be carried forward indefinitely. The federal net operating loss carryforwards generated prior to January 1, 2018 are subject to a 20-year carryforward period and will begin to expire after 2032. Subsequent to the enactment of the 2017 Tax Act, the utilization of the federal net operating loss carryforwards generated in fiscal year 2018 and onwards is limited to 80% of the federal taxable income. The Company also had approximately $145.8 million in state net operating loss carryforwards to reduce future taxable income, which will begin to expire after 2028, if not utilized.

The Company had approximately $3.1 million in federal research and development tax credits for each of the years ended December 31, 2020 and 2019. In addition, the Company had approximately $4.0 million in state research and development tax credits for each of the years ended December 31, 2020 and 2019. The federal research credits will begin to expire in the years 2028 through 2035, if not utilized. The state research and development credits have no expiration date and can be carried forward indefinitely.

As of December 31, 2020 and 2019, the Company had foreign net operating loss carryforwards of approximately $35.8 million and $29.7 million, respectively, which have no expiration date.

Utilization of the Company's net operating losses and credits may be subject to a substantial annual limitation due to the "change in ownership" provisions of the Internal Revenue Code of 1986, as amended, and similar state provisions. The annual limitation may result in the expiration of net operating losses and credits before utilization.

A reconciliation of the Company's unrecognized tax benefits is as follows (in thousands):

	December 31,		
	2020	2019	2018
Balance at beginning of year	$ 3,819	$ 3,819	$ 1,528
Additions based on tax positions related to prior year	314	—	2,291
Additions based on tax positions related to current year	6,213	—	—
Balance at end of year	$ 10,346	$ 3,819	$ 3,819

The entire amount of the unrecognized tax benefits would not impact the Company's effective tax rate if recognized. The Company has elected to include interest and penalties as a component of tax expense. During the years ended December 31, 2020 and 2019, the Company did not recognize accrued interest and penalties related to unrecognized tax benefits. The Company does not anticipate that the amount of existing unrecognized tax benefits will significantly increase or decrease during the next 12 months.

The Company files federal, state and foreign income tax returns with varying statutes of limitations. The tax years from inception in 2008 to December 31, 2019 remain subject to examination.

On March 27, 2020, the Coronavirus Aid, Relief and Economic Security Act, or the CARES Act, was enacted. Under U.S. GAAP, the Company is required to recognize the tax effects of new legislation in the reporting period in which the legislation was enacted. The CARES Act included changes to current U.S. tax provisions that benefit business entities and modified certain tax provisions of the 2017 Tax Act. The tax relief measures included a five-year net operating loss carryback, suspension of the annual deduction limitation of 80% of taxable income from net operating losses generated in a tax year beginning after December 31, 2017, changes in the deductibility of interest, acceleration of alternative minimum tax credit refunds, payroll tax relief and a technical correction to allow accelerated deductions for qualified improvement properties. The CARES Act also provided other non-tax benefits to assist business entities impacted by the ongoing COVID-19 pandemic. The Company has evaluated the CARES Act and concluded that it did not result in any material adjustments to the Company's income tax provision or net deferred tax assets for the year ended December 31, 2020.

10. Subsequent Events

Public Offering of Common Stock

On January 5, 2021, the Company entered into an underwriting agreement with representatives of several underwriters relating to the public offering, issuance and sale of 4,629,630 shares of its common stock. The price to the public in the offering was $27.00 per share. Under the terms of the underwriting agreement, the Company granted the underwriters an option exercisable for 30 days to purchase up to an additional 694,444 shares of common stock at the public offering price, less underwriting discounts and commissions. The underwriters exercised in full their option to purchase the additional shares. The net proceeds to the Company from the offering were approximately $134.7 million, after deducting underwriting discounts and commissions and other estimated offering expenses payable by the Company. The offering closed on January 8, 2021.

Merck Collaboration

Under the terms of the collaboration, Merck was required to notify the Company no later than March 17, 2021 of its unilateral decision whether to exercise its option to extend the research phase of the collaboration for an additional two-year term through March 16, 2024. The parties are negotiating in good faith certain modifications to the terms of the collaboration and in order to allow negotiations to proceed, the parties have agreed to extend the March 17, 2021 deadline for Merck to deliver its extension notification decision until June 30, 2021.

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

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

As of December 31, 2020, management, with the participation of our Chief Executive Officer and Chief Financial Officer, performed an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act. Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including the Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding required disclosures.

Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objective and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of December 31, 2020, the design and operation of our disclosure controls and procedures were effective at a reasonable assurance level.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(f) and 15d-15(f) of the Exchange Act that occurred during the quarter ended December 31, 2020 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act). Under the supervision of and with the participation of our principal executive officer and principal financial officer, our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2020 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in "Internal Control—Integrated Framework" (2013). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2020.

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Information required by this item regarding directors and director nominees, executive officers, the board of directors and its committees, and certain corporate governance matters is incorporated by reference to the information set forth under the captions “Proposal No. 1—Election of Directors,” “Corporate Governance and Board Matters” and “Executive Officers” in our Proxy Statement for our 2021 Annual Meeting of Stockholders, or the 2021 Proxy Statement. Information required by this item regarding compliance with Section 16(a) of the Exchange Act is incorporated by reference to the information set forth under the caption “Delinquent Section 16(a) Reports” in our 2021 Proxy Statement.

Our written code of business conduct and ethics, the Code of Conduct, applies to all of our employees, officers and directors, including our principal executive officer, principal financial officer and principal accounting officer or controller. The Code of Conduct is available on our corporate website at https://www.ngmbio.com/ in the Investors & Media section under “Corporate Governance.” If we make any substantive amendments to our Code of Conduct or grant any of our directors or executive officers any waiver, including any implicit waiver, from a provision of our Code of Conduct, we will disclose the nature of the amendment or waiver on our website or in a Current Report on Form 8-K.

Item 11. Executive Compensation.

Information required by this item regarding executive compensation is incorporated by reference to the information set forth under the captions “Executive Compensation” and “Director Compensation” in the 2021 Proxy Statement.

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

Information required by this item regarding security ownership of certain beneficial owners and management is incorporated by reference to the information set forth under the caption “Security Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plans at December 31, 2020” in the 2021 Proxy Statement.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

Information required by this item regarding certain relationships, related transactions and director independence is incorporated by reference to the information set forth under the caption “Transactions with Related Persons and Indemnification” and “Corporate Governance and Board Matters” in the 2021 Proxy Statement.

Item 14. Principal Accounting Fees and Services.

Information required by this item regarding principal accounting fees and services is incorporated by reference to the information set forth under the caption “Proposal No. 2—Ratification of Selection of Independent Registered Public Accounting Firm” in the 2021 Proxy Statement.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a) The following documents are filed as part of this Annual Report on Form 10-K:

1. *Financial Statements.* See Index to Financial Statements in Part II Item 8 of this Annual Report on Form 10-K.

2. *Financial Statement Schedules*. None. All financial statement schedules are omitted because they are not applicable, not required under the instructions, or the requested information is included in the consolidated financial statements or notes thereto.

3. *Exhibits*. The following is a list of exhibits filed with this Annual Report or incorporated herein by reference:

		Incorporated by Reference				
Exhibit Number	**Exhibit Description**	**Form**	**File No.**	**Exhibit**	**Filing Date**	**Filed Herewith**
3.1	Amended and Restated Certificate of Incorporation.	8-K	001-38853	3.1	4/8/19	
3.2	Amended and Restated Bylaws.	S-1	333-227608	3.4	9/28/18	
4.1	Amended and Restated Investors' Rights Agreement among the Registrant and certain of its stockholders, dated March 20, 2015.	S-1	333-227608	4.1	9/28/19	
4.2	Form of Common Stock Certificate.	S-1	333-227608	4.2	4/1/19	
4.3	Description of Capital Stock.	10-K	001-38853	4.3	3/17/20	
10.1*	2008 Equity Incentive Plan, as amended.	S-1	333-227608	10.1	9/28/18	
10.2*	Form of Stock Option Agreement and Stock Option Grant Notice under the 2008 Equity Incentive Plan.	S-1	333-227608	10.2	9/28/18	
10.3*	Amended and Restated 2018 Equity Incentive Plan.	S-1	333-227608	10.3	3/25/19	
10.4*	Forms of Stock Option Agreement and Notice of Grant of Stock Option under the Amended and Restated 2018 Equity Incentive Plan.	S-1	333-227608	10.4	3/25/19	
10.5*	Forms of Restricted Stock Unit Agreement and Notice of Grant of Restricted Stock Unit under the Amended and Restated 2018 Equity Incentive Plan.	S-1	333-227608	10.5	3/25/19	
10.6*	2019 Employee Stock Purchase Plan.	S-1	333-227608	10.6	3/25/19	
10.7*	Form of Indemnification Agreement, by and between NGM Biopharmaceuticals, Inc. and each of its directors and executive officers.	S-1	333-227608	10.7	9/28/18	
10.8*	NGM Biopharmaceuticals, Inc. Non-Employee Director Compensation Policy.	S-1	333-227608	10.8	3/25/19	

10.9	Sublease Agreement, by and between NGM Biopharmaceuticals, Inc. and AMGEN Inc., dated December 11, 2015.	S-1	333-227608	10.9	9/28/18	
10.10*	Executive Employment Offer Letter, by and between NGM Biopharmaceuticals, Inc. and Jin-Long Chen, Ph.D.	S-1	333-227608	10.11	9/28/18	
10.11*	Executive Employment Agreement, by and between NGM Biopharmaceuticals, Inc. and David Woodhouse, Ph.D.	S-1	333-227608	10.13	3/25/19	
10.12*	Offer Letter Agreement, by and between the Registrant and Siobhan Nolan Mangini, dated as of May 20, 2020	10-Q	001-38853	10.12	8/12/20	
10.13#	Research Collaboration, Product Development and License Agreement by and between NGM Biopharmaceuticals, Inc. and Merck Sharp & Dohme Corp., dated as of February 18, 2015.	S-1	333-227608	10.15	9/28/18	
10.14#	First Amendment to Research Collaboration, Product Development and License Agreement by and between NGM Biopharmaceuticals, Inc. and Merck Sharp & Dohme Corp., dated as of January 1, 2016.	S-1	333-227608	10.16	9/28/18	
10.15	Letter Agreement, by and between NGM Biopharmaceuticals, Inc. and Merck Sharp & Dohme Corp., dated as of March 20, 2015.	S-1	333-227608	10.17	9/28/18	
10.16#	Multi-Product Licence Agreement by and between NGM Biopharmaceuticals, Inc. and Lonza Sales AG, dated as of October 31, 2014, as amended by Amendment No. 1 on July 28, 2015, Amendment No. 2 on October 7, 2015, Amendment No. 3 on April 26, 2016, Amendment No. 4 on October 3, 2017, Amendment No. 5 on March 16, 2018 and Amendment No. 6 on February 6, 2019.	S-1	333-227608	10.17	4/1/19	
10.17**	Amendment No. 7 on December 22, 2020 to Multi-Product Licence Agreement by and between NGM Biopharmaceuticals, Inc. and Lonza Sales AG, dated as of October 31, 2014					X
10.18**	Amendment No. 8 on February 10, 2021 to Multi-Product Licence Agreement by and between NGM Biopharmaceuticals, Inc. and Lonza Sales AG, dated as of October 31, 2014					X
10.19	Letter Agreement, by and between NGM Biopharmaceuticals, Inc. and Merck Sharp & Dohme Corp., dated as of March 15, 2019.	S-1	333-227608	10.18	3/25/19	
21.1	Subsidiaries of NGM Biopharmaceuticals, Inc.					X

23.1	Consent of Independent Registered Public Accounting Firm.	X
24.1	Power of Attorney (included on signature page).	X
31.1	Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X
31.2	Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X
32.1†	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X
101.INS	XBRL Instance Document.	X
101.SCH	XBRL Taxonomy Extension Schema Document.	X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	X

* Indicates management contract or compensatory plan or arrangement.

** Certain identified information has been excluded from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

Confidential treatment has been granted for a portion of this exhibit.

† The certifications attached as Exhibit 32.1 accompany this Annual Report on Form 10-K are not deemed filed with the SEC and are not to be incorporated by reference into any filing of NGM Biopharmaceuticals, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Annual Report on Form 10-K, irrespective of any general incorporation language contained in such filing.

Item 16. Form 10-K Summary.

None.

SIGNATURES

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

NGM Biopharmaceuticals, Inc.

Date: March 15, 2021

By: /s/ David J. Woodhouse
David J. Woodhouse, Ph.D.
Chief Executive Officer and Director

Date: March 15, 2021

By: /s/ Siobhan Nolan Mangini
Siobhan Nolan Mangini
Chief Financial Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints William J. Rieflin, David J. Woodhouse, Siobhan Nolan Mangini and Valerie Pierce, and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution for him or her, and in his or her name in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith, with the U.S. Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, and either of them, his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, 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/ David J. Woodhouse David J. Woodhouse, Ph.D.	Chief Executive Officer and Director *(Principal Executive Officer)*	March 15, 2021
/s/ Siobhan Nolan Mangini Siobhan Nolan Mangini	Chief Financial Officer *(Principal Financial and Accounting Officer)*	March 15, 2021
/s/ Bill Rieflin William J. Rieflin	Executive Chairman and Director	March 15, 2021
/s/ Jin-Long Chen Jin-Long Chen, Ph.D.	Chief Scientific Officer and Director	March 15, 2021
/s/ David V. Goeddel, Ph.D. David V. Goeddel, Ph.D.	Director	March 15, 2021
/s/ Shelly D. Guyer Shelly D. Guyer	Director	March 15, 2021
/s/ Carole Ho Carole Ho, MD	Director	March 15, 2021
/s/ Suzanne Hooper Suzanne Sawochka Hooper	Director	March 15, 2021
/s/ Mark Leschly Mark Leschly	Director	March 15, 2021
/s/ David Schnell, M.D. David Schnell, M.D.	Director	March 15, 2021
/s/ McHenry T. Tichenor McHenry T. Tichenor, Jr.	Director	March 15, 2021

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

Exhibit 10.17

AMENDMENT No. 7

to

MULTI-PRODUCT LICENCE AGREEMENT

dated

31 October 2014

between

LONZA SALES AG

and

NGM BIOPHARMACEUTICALS, INC.

THIS AMENDMENT No. 7 (“Amendment No.7”) to the Multi-Product Licence Agreement, dated 31 October 2014, as amended by Amendment No. 1, dated 28 July 2015, Amendment No. 2, dated 07 October 2015, Amendment No. 3, dated 26 April 2016, Amendment No. 4, dated 03 October 2017, Amendment No. 5, dated 16 March 2018, and Amendment No. 6, dated 06 February 2019 (collectively the “Agreement”) is made effective as of the last dates of signatures between the parties (the “Amendment No. 7 Effective Date”).

Between

LONZA SALES AG incorporated and registered in Switzerland whose registered office is at Muenchensteinerstrasse 38, CH-4002, Basel, Switzerland ("Lonza"), and

NGM BIOPHARMACEUTICALS, INC., incorporated and registered in the State of Delaware whose registered office is at 333 Oyster Point Blvd., South San Francisco, CA 94080, USA, ("Licensee").

Lonza and Licensee may be independently defined as a “Party” or collectively as the “Parties”.

WHEREAS

A. Lonza and the Licensee entered into the Agreement, pursuant to which Lonza licensed certain Intellectual Property Rights (as therein defined) to the Licensee (“Agreement”).

B. Lonza previously granted its consent to the appointment of Licensee’s Affiliate,

NGM Biopharmaceuticals Australia Pty Ltd. (“NGM Australia”), as a Sublicensee pursuant to Clause 4.3 of the Agreement. Licensee notified Lonza of a change to

NGM Australia’s address and the Parties wish to amend the terms of the Agreement to reflect this modification.

C. Lonza previously granted its consent to the appointment of Licensee’s Strategic Partner, Merck Sharp & Dohme Corp. of One Merck Drive, Whithouse Station, NJ

08889, USA (“Merck”), as a Sublicensee in respect of [*], with effect from [*].

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

D. Licensee has given written notice to Lonza that it wishes to terminate the appointment of Merck as a Sublicensee with effect from [*] and that [*] with effect from [*].

E. Licensee notified Lonza of the [*] and [*] and the Parties therefore wish to update the Products table in Appendix 5 Table A with effect from [*].

F. Licensee notified Lonza that it will [*], and the Parties wish to amend the terms of the Agreement to reflect Licensee [*].

G. Licensee and Lonza now wish to amend the terms of the Agreement to reflect the address change of NGM Australia, and termination of the sublicence to Merck for [*].

NOW THEREFORE in consideration of the mutual promises and covenants contained herein and other good and valuable consideration the sufficiency of which is acknowledged it is hereby agreed by and between the Parties to amend the Agreement as follows:

1. Unless otherwise defined in this Amendment No.7, the words and phrases defined in the Agreement shall have the same meanings in this Amendment No.7.

2. Clause 4.3.6 (a) of the Agreement shall be deleted in its entirety and replaced with the following:

   (a) Lonza hereby consents to the grant of a sublicence by Licensee to its Affiliate NGM Biopharmaceuticals Australia Pty Ltd, Collins Square, Tower Five, Level 22, 727 Collins Street, DOCKLANDS VIC 3008, Australia.

3. Clause 4.3.6 (c) of the Agreement (as inserted by Amendment No. 1 to the Agreement) shall be deleted in its entirety.

4. Licensee hereby warrants and confirms to Lonza that all rights and sublicences granted to Merck for [*] under the terms of the Agreement, shall terminate with effect from [*].

5. Licensee hereby warrants and confirms to Lonza that [*] with effect from [*].

6. Licensee hereby warrants and confirms to Lonza that [*] with effect from [*].

7. Licensee shall ensure that any and all [*] provided to Merck under the Agreement or otherwise in the possession of Merck (including without limitation [*]) are destroyed or returned to the Licensee no later than [*]; provided, that Merck may retain one (1) copy of [*] in its secure electronic backup files for archival purposes provided always that Licensee is responsible for [*].

8. Licensee shall ensure that any and all [*] provided to Merck under the Agreement or otherwise in the possession of Merck (including without limitation [*] are destroyed or returned to the Licensee no later than [*]; provided, that Merck may retain one (1) copy of any [*] in its secure electronic backup files for archival purposes provided always that Licensee is responsible for [*].

9. Licensee hereby warrants and confirms to Lonza that [*] with effect from [*], with the exception of [*]. Licensee will notify Lonza in writing when [*], which shall be subject to the terms of the Agreement. The parties agree that [*] will not [*] under the Agreement.

10. Licensee hereby warrants and confirms to Lonza that [*] with effect from [*], with the exception of [*]. Licensee will notify Lonza in writing when [*], which shall be subject to the terms of the Agreement. The parties agree that [*] will not [*] under the Agreement.

11. Licensee hereby warrants and confirms to Lonza that [*] with effect from [*], with the exception of [*]. Licensee will notify Lonza in writing when [*], which shall be subject to the terms of the Agreement. The parties agree that [*] will not [*] under the Agreement.

12. Lonza hereby consents to the grant of a sublicence to [*] for the purpose of [*], at [*]. [*] are not part of [*] and therefore [*].

13. Licensee hereby confirms and undertakes to Lonza that Licensee shall be and shall remain responsible for [*], whether occurring before, on or after [*].

14. Appendix 5 of the Agreement shall be deleted in its entirety and replaced by the Appendix 5 attached hereto.

15. Save as expressly provided herein all terms and conditions of the Agreement shall continue in full force and effect.

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

AS WITNESS the hands of the duly authorized representatives of the parties hereto the day and year first before written.

SIGNED BY:
For and on behalf of
LONZA SALES AG

/s/ Bart van Aarnhem

Associate General Counsel

Title

Dec 21, 2020

Date

SIGNED BY:
For and on behalf of
LONZA SALES AG

/s/ Henit Lapid

Head of Marketing, MMDM

Title

Dec 22, 2020

Date

SIGNED BY:
For and on behalf of
NGM BIOPHARMACEUTICALS, INC.

/s/ Valerie L. Pierce

SVP & General Counsel

Title

12/18/2020

Date

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

APPENDIX 5

PRODUCTS

Table A

Product	Product Name	[*]
[*]	[*]	[*]

*The Licensee shall notify Lonza in writing within a period of [*] days for [*] for each Product.

[*]

Table B

COMMERCIAL PRODUCTS AND ROYALTIES

Commercial Product	Product Name	Rate of Royalty	Party manufacturing the Product
Product #1			
Product #2			
Product #3			
Product #4			
Product #5 etc			

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

Exhibit 10.18

AMENDMENT No. 8

To the

MULTI-PRODUCT LICENCE AGREEMENT

dated

31 October 2014

between

LONZA SALES AG

and

NGM BIOPHARMACEUTICALS, INC.

This Amendment No. 8 (“**Amendment No.8**”) to the Multi-Product License Agreement, dated 31 October 2014, and as amended by Amendment No. 1, dated 28 July 2015 , Amendment No. 2, dated 07 October 2015, Amendment No. 3, dated 26 April 2016, Amendment No. 4, dated 03 October 2017, Amendment No. 5, dated 16 March 2018, Amendment No. 6, dated 06 February 2019 and Amendment 7, dated 22 December 2020 (collectively the “**Agreement**”) is made effective as of the last dates of signatures between the parties (the “**Amendment No. 8 Effective Date**”); and is

By and Between

LONZA SALES AG incorporated and registered in Switzerland whose registered office is at Muenchensteinerstrasse 38, CH-4002, Basel, Switzerland ("**Lonza**"), and

NGM BIOPHARMACEUTICALS, INC., incorporated and registered in the State of Delaware whose registered office is at 333 Oyster Point Blvd., South San Francisco, CA 94080, USA, ("**Licensee**").

Lonza and Licensee may be independently defined as a “**Party**” or collectively as the “**Parties**”.

WHEREAS

A. Lonza and the Licensee entered into the Agreement, pursuant to which Lonza licensed certain Intellectual Property Rights (as therein defined) to the Licensee (“**Agreement**”).

B. Licensee notified Lonza of the [*] and the Parties therefore agree to update the Products table in Appendix 5 Table A.

C. The Parties wish to amend the terms of the Agreement.

NOW THEREFORE in consideration of the mutual promises and covenants contained herein and other good and valuable consideration the sufficiency of which is acknowledged it is hereby agreed by and between the Parties to amend the Agreement as follows:

1. Unless otherwise defined in this Amendment No.8, the words and phrases defined in the Agreement shall have the same meanings in this Amendment No.8.

2. Licensee hereby warrants and confirms to Lonza that [*] with the exception of [*]. Licensee also warrants and confirms to Lonza that [*]. Licensee will notify Lonza in writing when [*] which shall be subject to the terms of the Agreement. The parties agree that [*] will not [*] under the Agreement.

3. Appendix 5 of the Agreement shall be deleted in its entirety and replaced by the Appendix 5 attached hereto.
4. Save as expressly provided herein all terms and conditions of the Agreement shall continue in full force and effect.

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

AS WITNESS, the hands of the duly authorized representatives of the parties hereto the Amendment No. 8 Effective Date.

SIGNED BY: For and on behalf of **LONZA SALES AG**	/s/ Bart van Aarnhem
	Associate General Counsel Title
	Feb 10, 2021 Date
SIGNED BY: For and on behalf of **LONZA SALES AG**	Dan Mekic
	Head of Income Management and Forecasting LI Title
	Feb 10, 2021 Date
SIGNED BY: For and on behalf of **NGM BIOPHARMACEUTICALS, INC.**	/s/ Valerie L. Pierce
	SVP & General Counsel Title
	2/4/2021 Date

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

APPENDIX 5

PRODUCTS

Table A

Product	Product Name	[*]
[*]	[*]	[*]

*The Licensee shall notify Lonza in writing within a period of [*] days for [*] for each Product.

[*]

Table B

COMMERCIAL PRODUCTS AND ROYALTIES

Commercial Product	Product Name	Rate of Royalty	Party manufacturing the Product
Product #1			
Product #2			
Product #3			
Product #4			
Product #5			
Product #6			
Product #7			

[*] = Certain information contained in this document, marked by brackets, has been omitted from this exhibit because it is both not material and would be competitively harmful if publicly disclosed.

Exhibit 21.1

SUBSIDIARIES

Subsidiary Name	Jurisdiction of Incorporation or Organization
NGM Biopharmaceuticals Australia Pty Ltd.	Australia

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-8 No. 333-230725) pertaining to NGM Biopharmaceuticals, Inc. Amended and Restated 2018 Equity Incentive Plan and NGM Biopharmaceuticals, Inc. 2019 Employee Stock Purchase Plan;
2. Registration Statement (Form S-8 No. 333-237243) pertaining to NGM Biopharmaceuticals, Inc. Amended and Restated 2018 Equity Incentive Plan; and
3. Registration Statement (Form S-3 No. 333-238991) and related prospectus and prospectus supplements of NGM Biopharmaceuticals, Inc.;

of our report dated March 15, 2021, with respect to the consolidated financial statements of NGM Biopharmaceuticals, Inc., included in this Annual Report (Form 10-K) of NGM Biopharmaceuticals, Inc. for the year ended December 31, 2020.

/s/ Ernst & Young LLP

Redwood City, California
March 15, 2021

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13A-14(A) AND 15D-14(A) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, David J. Woodhouse, certify that:

1. I have reviewed this Annual Report on Form 10-K of NGM Biopharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. I am responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under my supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to me by others within those entities, particularly during the period in which this report is being prepared;

   (b) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report my conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (c) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. I have disclosed, based on my 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 15, 2021

By: /s/ David J. Woodhouse, Ph.D.
David J. Woodhouse, Ph.D.
Chief Executive Officer and Director
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATIONS OF PERIODIC REPORT UNDER SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Siobhan Nolan Mangini, certify that:

1. I have reviewed this Annual Report on Form 10-K of NGM Biopharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (c) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; 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 15, 2021

By: /s/ Siobhan Nolan Mangini
Siobhan Nolan Mangini
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, (the "Exchange Act") and Section 1350 of Chapter 63 of Title 18 of the United States Code (18 U.S.C. § 1350), David J. Woodhouse, Principal Executive Officer of NGM Biopharmaceuticals, Inc. (the "Company") and Siobhan Nolan Mangini, Chief Financial Officer of the Company, each hereby certifies that, to the best of his knowledge:

1. The Company's Annual Report on Form 10-K for the year ended December 31, 2020, to which this Certification is attached as Exhibit 32.1 (the "Annual Report"), fully complies with the requirements of Section 13(a) or Section 15(d) of the Exchange Act; and

2. The information contained in the Annual Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 15, 2021

/s/ David J. Woodhouse, Ph.D.
David J. Woodhouse, Ph.D.
Chief Executive Officer and Director
(Principal Executive Officer)

/s/ Siobhan Nolan Mangini
Siobhan Nolan Mangini
Chief Financial Officer
(Principal Financial Officer)

This certification accompanies the Annual Report on Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of NGM Biopharmaceuticals, Inc. 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. A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.