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, 2021

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, 2021, the last business day of the registrant's most recently completed second fiscal quarter, was approximately $755 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 39,014,460 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 February 23, 2022, the number of outstanding shares of the registrant's common stock, par value $0.001 per share, was 78,049,340.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement for the 2022 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.
2021 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, "aim," “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” "seek," “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;
- our (and in the case of any product candidate licensed by Merck, Merck’s) ability to obtain and maintain regulatory approvals for aldafermin, MK-3655, NGM621, NGM707, NGM831, NGM438, NGM120 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 that 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;
- our belief that NGM831 has the potential to fight tumors by shifting myeloid cells from a suppressive state to a stimulatory state and promote anti-tumor activity;
- our belief that NGM438 has the potential to potently block the binding of all collagens to LAIR1 and to address a key resistance mechanism that limits tumor responses to current immunotherapies;
- our belief that NGM120 may reduce tumor growth and improve survival in syngeneic orthotopic pancreatic tumor models;
- our belief that NGM621 has the potential to reduce diseases progression in patients with geographic atrophy;
- our belief that MK-3655 has the potential to be a treatment for patients with NASH with early to moderate fibrosis;
- our belief regarding the impact of our product candidates’ side effects and our ability to effectively manage these side effects;
- our ability to obtain funding for our operations;
- our plans to research, develop and commercialize our product candidates;
- the commercialization of our product candidates, if approved;
- 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, NGM621, NGM120, NGM707, NGM831, 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;
- the performance of, and our ability to obtain sufficient supply of clinical trial material in a timely manner from, third-party suppliers and manufacturers;
- our beliefs around the competitive landscape for our product candidates and 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 Merck providing significantly more limited annual research funding beginning in 2022;
- our expectations regarding our ability to obtain, maintain, protect and enforce intellectual property protection for our product candidates; and

- the risks, uncertainties and other factors we identify elsewhere in this Annual Report on Form 10-K and in our other filings with the U.S. Securities and Exchange Commission.

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.

- 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;
- all of our revenue for recent periods has been received from a single collaboration partner, Merck Sharp & Dohme Corp., or Merck, and that revenue will be substantially lower beginning in 2022;
- in order to complete the development and commercialization of our current and potential future product candidates and to finance our other operations, we will require substantial additional capital that may not be available to us on acceptable terms, or at all, and as a result, we may be required to delay, scale back or discontinue development of our product candidates;
- we need to successfully complete rigorous preclinical and clinical testing of our product candidates before we can seek regulatory approval, and the regulatory approval processes of the U.S. Food and Drug Administration and comparable foreign health authorities are lengthy and inherently unpredictable, and if we are not successful at each step of the process, commercialization of our product candidates will be delayed or prevented;
    - our most advanced product candidates, NGM621, NGM120, aldafermin and MK-3655, are only in Phase 2 development, 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, including the ongoing trial of NGM707, may fail to produce positive results or to demonstrate safety and efficacy to the satisfaction of health authorities;
- aldafermin and MK-3655 are being developed for the treatment of nonalcoholic steatohepatitis, or 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, as evidenced by the fact that our previously completed Phase 2b ALPINE 2/3 trial of aldafermin in patients with NASH and liver fibrosis stage 2 or 3, or F2 or F3, did not meet its primary endpoint and, as a result, we decided to suspend further development of aldafermin in patients with F2/F3 NASH;
- we may not be able to obtain and maintain the relationships with our current collaborator, Merck, potential future collaborators and other third parties that are necessary to develop, manufacture and commercialize some or all of our product candidates;
    - we depend on our collaboration with Merck for revenue and for the development and commercialization of our product candidates that remain within the scope of the collaboration;
    - in the future we may depend on collaborations with other third parties for revenue and for the development and commercialization of our product candidates and such collaborations involve numerous risks, any of which could materially and adversely affect our business and financial condition; and
    - we rely completely on contract manufacturers for the manufacture of our product candidates and the process of manufacturing, and conducting release testing for, our biologic product candidates is complex, highly regulated and subject to many risks, including our current reliance on single source manufacturers and suppliers, difficulties in supply chain, including procuring raw materials and components and the availability of manufacturing slots, and difficulties in production, including scaling up and validating initial production, contamination, equipment failure, improper installation or operation of equipment, vendor or operator error, turnover of qualified staff or improper storage

conditions, or difficulties with quality control, product stability or quality assurance testing, 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 COVID-19 pandemic continues to adversely impact our business and operations, as well as the businesses or operations of our contract manufacturers, clinical research organizations, clinical trial sites or other third parties with whom we conduct business;
- 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 our Chief Scientific Officer, Dr. Jin-Long Chen, and during the ongoing COVID-19 pandemic we have experienced employee attrition at rates higher than we have experienced historically, which may continue or be exacerbated and could have a negative impact on our productivity;
- our product candidates other than aldafermin and MK-3655 are currently manufactured at a facility in Lithuania. The invasion of Ukraine by Russia and the retaliatory measures taken or that may be taken by the United States, NATO and others create global security concerns, including the possibility of expanded regional or global conflict, and are likely to have short-term and likely longer-term negative impacts on regional and global economies, any or all of which could disrupt our supply chain and adversely affect our ability to conduct ongoing and future clinical trials of our product candidates and our ability to raise capital on favorable terms;
- 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;
- we may not successfully identify new product candidates to expand our development pipeline;
- 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 or third parties we rely on or partner with could experience a cybersecurity incident that could harm our business;
- 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; and
- we continue to incur increased costs as a result of operating as a public company and our management devotes substantial time to public company compliance initiatives. We are obligated to develop and maintain proper and effective internal control over financial reporting, and, beginning with this Annual Report on Form 10-K, we are required to comply with the requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act. If we are not able to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner, or if we or our independent registered public accounting firm identify deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, investors may lose confidence in our operating results and the price of our common stock could decline.

PART I

Item 1. Business.

Overview of Our Business

We are a biopharmaceutical company focused on discovering and developing novel, potentially life-changing medicines for people whose health and lives have been disrupted by disease. Our biology-centric drug discovery approach aims to seamlessly integrate interrogation of complex disease-associated biology and protein engineering expertise to unlock proprietary insights that are leveraged to generate promising product candidates and enable their rapid advancement into proof-of-concept studies. As explorers on the frontier of life-changing science, we aspire to operate one of the most productive research and development engines in the biopharmaceutical industry. Currently, we have seven disclosed programs, including four in Phase 2 or 2b studies, across three therapeutic areas: cancer, retinal diseases and liver and metabolic diseases. Our seven most advanced product candidates and their stages of development are presented below:

[1] Phase 1a cohort = monotherapy; Phase 1b cohort = in combination with standard-of-care treatment of gemcitabine + Nab-paclitaxel
[2] At NGM's option at Phase 3
NASH = non-alcoholic steatohepatitis; FGF = fibroblast growth factor; KLB = klotho beta; GFRAL = glial cell-derived neurotrophic factor receptor alpha-like; ILT2 = immunoglobulin-like transcript 2; ILT4 = immunoglobulin-like transcript 4; ILT3 = immunoglobulin-like transcript 3; LAIR1 = Leukocyte-associated immunoglobulin-like receptor 1; F2/F3/F4 = stage 2 or 3 or 4 liver fibrosis; PoC = proof of concept

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

Our Mission and Strategy

Our mission is to translate complex, powerful biology with rigor and urgency into life-changing medicines. Our strategy is built on a straightforward central premise: create an environment that both allows drug discovery research to thrive by focusing on powerful human biology unconstrained by therapeutic area or technology approach and remain grounded in the singular motivation of delivering impactful medicines to address critical unmet or underserved needs of patients suffering from grievous diseases. All therapeutic candidates in our pipeline have been generated by our in-house discovery engine, with a therapeutic area-agnostic mindset, always led by biology and motivated by patient need.

Key elements of our strategy are:

- **Systematically and empirically interrogate complex disease-associated biology.** We employ unbiased, systematic investigations of complex disease-associated biology in pursuit of uncovering novel mechanisms of action and identifying proprietary insights into critical biological processes and pathways demonstrating powerful biological effects.

- **Remain biologics-focused, but modality flexible, leveraging a versatile approach to designing unique solutions for complex problems.** Building on these biological insights, we deploy our protein and antibody engineering expertise to create product candidates designed to be highly specific, to modulate targeted processes and to boost therapeutic potential. We have an unbiased antibody generation approach and use an array of modalities and technologies to optimize the properties of our antibody product candidates and native proteins.

- **Urgently advance therapies to meet unmet needs.** We seek to move promising product candidates we have discovered and developed rapidly into proof-of-concept clinical studies and, if warranted, late-stage development.

- **Build a diversified pipeline, honed with disciplined prioritization.** 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 our decision not to proceed with development activities on multiple potentially viable product candidates for portfolio management reasons to concentrate our resources on what we consider our most promising product candidates.

- **Recruit and retain industry-leading research and development talent.** Our talented and experienced team is the foundation of our company. We aim to attract outstanding individuals with expertise in discovery sciences, protein and antibody engineering, pharmacology, translational medicine and preclinical and clinical development who are committed to sustaining and enhancing our scientific excellence, rigor and innovation, our creative clinical development and our high level of productivity.

- **Pursue collaborations with strategic partners when beneficial.** Partnering has been and is expected to continue to be a key component of our strategy. For example, our collaboration with Merck Sharp & Dohme Corp., or Merck, described in more detail below, has historically provided us with robust financial support that enabled us to broaden and accelerate our research efforts and to develop more product candidates for major indications than we could have advanced on our own. Given the breadth of opportunities that have been, and may in the future be, produced by our prolific discovery engine, we may decide to pursue additional strategic partners to progress, in whole or in part, some of our wholly-owned product candidates and/or commercialize any resulting approved products.

COVID-19 Business Update

For 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 and "Management's Discussion and Analysis of Financial Condition and Results of Operations—Overview" 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. Our current diverse pipeline of seven product candidates can be divided into three therapeutic areas: oncology, retinal diseases and liver and metabolic diseases.

Therapeutic Area: Oncology

Cancer Disease Overview

Cancer is a leading cause of death globally and was responsible for an estimated almost ten million deaths in 2020. There were an estimated over 19 million newly diagnosed cancer cases around the world in 2020, 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 in 2020, causing approximately 600,000 deaths that year.

The unmet medical need for pancreatic cancer is high. About 60,000 patients were estimated to be diagnosed with pancreatic cancer in the United States in 2021. Pancreatic cancer is seldom detected early when it is most curable because symptoms often do not develop until after it has spread to other organs. The one-year survival rate across all stages of pancreatic ductal adenocarcinoma, which accounts for more than 90% of all pancreatic tumors, is 18%, reflecting the fact that tumors progress rapidly and the advanced stage of disease at diagnosis. Prognosis is also impacted by the high incidence of cancer-related cachexia in pancreatic cancer patients.

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 therapy approved by the U.S. Food and Drug Administration, or FDA, or the European Medicines Agency, or EMA. 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.

NGM707, NGM831 and NGM438: Our Myeloid Reprogramming and Checkpoint Inhibition Portfolio Designed to Enhance Anti-Tumor Immunity

Over the past decade, advances in cancer immunotherapy have driven significant improvements in clinical outcomes, especially in certain cancer types that are immunogenic, or capable of provoking an immune response. In particular, T cell checkpoint inhibitors, including immune checkpoint inhibitors targeting Programmed Cell Death Protein 1 and Programmed Cell Death Protein Ligand 1, or PD-1 and PD-L1, respectively, are designed to inhibit immune checkpoint pathways. When turned “on,” these pathways act as “brakes” on anti-tumor immune responses, enabling tumors to evade detection and destruction by the immune system, and T cell checkpoint inhibitors essentially work to “release” the “brakes” by turning off those pathways. However, the overall response rate to PD-1/PD-L1 inhibitors is typically only 20% to 30% and many cancer patients who initially experience a full or partial response using T cell checkpoint inhibitors may eventually experience cancer progression.

We have focused our cancer research on an emerging area of immuno-oncology research known as myeloid checkpoint inhibition. The tumor microenvironment, or TME, is composed of both cancerous and non-malignant cells. There is an abundance of myeloid cells present in the TME of many tumor types. While myeloid cells play a critical role in the immune system, in the tumor they can contribute to the inhibition of 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. In essence, they serve as myeloid checkpoints, keeping the “brakes on” and enabling tumors to evade the immune system and drive resistance to cancer therapies. Our focus is on promoting myeloid reprogramming - switching myeloid cells in the TME from an immunosuppressive state to a stimulatory state that enhances anti-tumor immunity by releasing the “brake” and allowing these myeloid cells to potentially play a pivotal role in anti-tumor activity by acting to both kill cancer cells directly as well through the recruitment and activation of tumor-directed T cells.

We have built a portfolio of three myeloid checkpoint inhibitor product candidates, NGM707, NGM831 and NGM438, targeting four receptors whose elevated expression in myeloid cells in the TME has been associated with poor patient responses to T cell checkpoint inhibitors. NGM707, NGM831 and NGM438 are wholly-owned programs. Although all three programs were originally researched and developed under a collaboration agreement with funding from Merck, we have the sole right, at our sole discretion, to independently research, develop and commercialize each of them, at our sole expense after March 2022, subject to the payment to Merck of low single-digit royalties on commercial sales of any resulting products. See “—Our Collaboration with Merck.”

NGM707: ILT2/ILT4 Dual Antagonist Antibody

Overview of NGM707

NGM707 is a novel dual antagonist monoclonal antibody that is designed to improve patient immune responses to tumors by inhibiting both 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 expressed on myeloid cells in the TME and are upregulated on macrophages in the TME 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 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.

Clinical Development of NGM707

In June 2021, we initiated a Phase 1/2 clinical trial that will evaluate NGM707 as a monotherapy and in combination with KEYTRUDA® (pembrolizumab) for the treatment of patients with advanced solid tumors. We expect to enroll approximately 180 patients in this trial. The open-label, Phase 1 portion of the trial is designed to evaluate the safety, tolerability and pharmacokinetics of NGM707 and to obtain preliminary evidence of any anti-

tumor activity. The Phase 1a cohort of the trial is evaluating NGM707 as a monotherapy. The Phase 1b cohort will evaluate NGM707 in combination with pembrolizumab in patients with advanced solid tumors. Initial data from the Phase 1a portion of the trial is expected in the second half of 2022. The Phase 1 portion of the trial is expected to be followed by a Phase 2 dose-expansion in cohorts of specific tumor types.

NGM707 Patent Portfolio

As of December 31, 2021, 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 U.S. and international patent applications we have filed. Any patent that may issue from these applications or any related applications we file 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 targeting both ILT2 and ILT4. However, there are several products in development that target either ILT4 or ILT2. We are aware of three clinical stage anti-ILT4 programs from Merck, Jounce Therapeutics, Inc., or Jounce, and Immune-Onc Therapeutics, Inc., or Immune-Onc. In September 2020, Merck presented interim 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 expects to have clinical data from its Phase 1 trial in 2022. Immune-Onc initiated a Phase 1 study of its anti-ILT4 therapeutic candidate, IO-108, in September 2021. OncoResponse, Inc., ImmunOS Therapeutics AG, Celldex Therapeutics, Inc. and Invectys Inc. have preclinical programs targeting ILT4. Biond Biologics Ltd., or Biond, has an antagonist antibody targeting ILT2, BND-22, which has been licensed by Sanofi, and a Phase 1 trial commenced in 2021. Jounce also has a preclinical program targeting ILT2. Finally, Adanate has an antibody, ADA-01, in preclinical development targeting LILRB family receptors that may include ILT4 and ILT2.

NGM831: ILT3 Antagonist Antibody

Overview of NGM831

NGM831 is a novel antagonist antibody that is designed to block the interaction of Immunoglobulin-like transcript 3, or ILT3 (also known as LILRB4), with fibronectin, a key component of the tumor stroma, as well as other cognate ligands. The tumor stroma refers to the non-malignant, non-immune components of the tumor. ILT3 is a fibronectin-binding inhibitory immune receptor that receives signals from the extracellular matrix to directly promote myeloid cell suppression. ILT3 is expressed on a variety of immune cells including tumor-associated myeloid cells, with particularly high expression on tolerogenic dendritic cells, or DCs, myeloid-derived suppressor cells and M2 macrophages, and high ILT3 expression is associated with poor survival. Moreover, fibronectin has been shown to be upregulated in multiple cancers and associated with tumor progression. For tumors in which both ILT3 and fibronectin are upregulated, the ILT3-fibronectin pathway may act as a stromal checkpoint to repress myeloid cell function and inhibit anti-tumor immunity. By inhibiting ILT3's interaction with fibronectin and its other ligands, we believe NGM831 has the potential to mobilize a patient's own immune system to fight tumors by shifting myeloid cells from a suppressive state to a stimulatory state and promoting anti-tumor activity. Our scientists have made discoveries related to this pathway, including the discovery of fibronectin as ILT3's functional ligand, as described in a publication in *Cancer Immunology Research*, a journal of the American Association for Cancer Research.

Clinical Development of NGM831

We anticipate initiating first-in-human testing of NGM831 in patients with advanced solid tumors in the first quarter of 2022.

NGM831 Patent Portfolio

As of December 31, 2021, we did not own or have a license to any issued patent that covers NGM831. However, NGM831 and related compositions-of-matter and methods of use are disclosed in pending U.S. and international patent applications we have filed. Any patent that may issue from these or related applications or any related applications we file is expected to expire no earlier than 2040, including any patent issued in the United States, if any, not including any patent term adjustments and any patent term extensions.

NGM831 Competition

We believe NGM831 is the only antibody being pursued clinically for the treatment of solid tumors that is intended to block the interaction of Immunoglobulin-like transcript 3, or ILT3, with fibronectin, as well as other cognate ligands. However, there are other programs that target ILT3 in the clinic. Merck, Immune-Onc and

Carbiogene Therapeutics Co. Ltd., or Carbiogene, all have clinical stage anti-ILT3 programs. Merck's anti-ILT3 program, MK-0482, is currently in Phase 2 development. Both Immune-Onc and Carbiogene's ILT3 programs, IO-202 and ILT3 CAR-T, are in Phase 1 development for acute myeloid leukemia. We are aware of four additional preclinical anti-ILT3 candidates in development: Biond has BND-35, Jounce has JTX-1484, and Immune-Onc has both an ILT3 CAR-T and an ILT3 bispecific under development.

NGM438: LAIR1 Antagonist Antibody

Overview of NGM438

NGM438 is a novel antagonist antibody that is designed to inhibit leukocyte-associated immunoglobulin-like receptor 1, or LAIR1, and thereby promote anti-tumor immune responses. NGM438 has the potential to potently block the binding of all collagens to LAIR1, including tumor-derived collagens. Collagens produced by the tumor stroma are believed to bind LAIR1 to create an immuno-suppressive TME. The interaction of collagens from the tumor stroma 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.

Clinical Development of NGM438

We anticipate initiating first-in-human testing of NGM438 in patients with advanced solid tumors in the second quarter of 2022.

NGM438 Patent Portfolio

As of December 31, 2021, 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 U.S. and international patent applications we have filed. Any patent that may issue from these applications or any related applications we file 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 two other anti-LAIR1 antibodies currently in development, Immune-Onc's preclinical-stage asset, IO-106, and NextCure, Inc.'s, or NextCure's, NC525. Nextcure also has a Phase 1 product candidate in the clinic, NC410, a LAIR2 fusion protein designed to mimic the natural decoy effects of LAIR2, which binds to collagens and blocks the activity of LAIR1.

NGM120: The Potential of GDF15/GFRAL Inhibition to Treat Cancer and Cancer-Related Cachexia

Our scientists have made several discoveries related to growth differentiation factor 15, or GDF15, including identifying its cognate receptor glial cell-derived neurotrophic factor receptor alpha-like, or 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 suppression, metabolic regulation and immune modulation. *In vivo* screening of human genes shows that GDF15 expression leads to an outsized effect on weight loss and, in animal models, elevated serum levels of GDF15 are a regulator of immune function, metabolism and feeding. In addition, elevated serum levels of GDF15 have been shown to be associated with cachexia. Evidence has shown that serum levels of GDF15 are elevated in patients across a number of tumor types and 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.

Overview of NGM120

NGM120 is an antagonist antibody that binds GFRAL and 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. Preclinical studies suggest that NGM120 may reduce tumor growth and improve survival in syngeneic orthotopic pancreatic tumor models.

Although NGM120 was originally researched and developed under a collaboration agreement with funding from Merck, we have the sole right, at our sole discretion, to independently research, develop and commercialize NGM120, at our sole expense after March 2022, subject to the payment to Merck of low single-digit royalties on commercial sales of any resulting products. See "—Our Collaboration with Merck."

Clinical Development of NGM120

We are currently conducting the Phase 1/2 PINNACLES clinical trial to assess NGM120's effect on cancer and cancer-related cachexia in patients with select advanced solid tumors and metastatic pancreatic cancer. In September 2021, at the European Society for Medical Oncology, or ESMO, Virtual Congress, we reported preliminary findings from two Phase 1 dose-escalation cohorts of the PINNACLES trial, including 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 Nab-paclitaxel in patients with metastatic pancreatic cancer. The preliminary results reported at ESMO showed that NGM120 was well tolerated with no dose-limiting toxicities and provided encouraging initial signals of anti-cancer activity in patients with advanced solid tumors. We plan to report additional data from the Phase 1a and Phase 1b cohorts of the PINNACLES trial in the second half of 2022.

We are continuing enrollment in the Phase 2 portion of the ongoing PINNACLES trial. This Phase 2 portion of the PINNACLES trial is to assess NGM120 in combination with gemcitabine and Nab-paclitaxel as first-line treatment in patients with metastatic pancreatic cancer.

NGM120 Patent Portfolio

As of December 31, 2021, we owned two issued patents in the United States, as well as one issued foreign patent covering NGM120 and related compositions-of-matter and methods of use. We also own pending patent applications covering similar subject matter in the United States and multiple jurisdictions outside of the United States. The issued patents are expected to expire in 2037, not including any patent term adjustments and any patent term extensions.

NGM120 Competition

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 is in a Phase 1 trial in healthy volunteers, Pfizer's monoclonal antibody PF-06946860 is in Phase 1 trials in solid tumors assessing various cachexia-related measures and anti-tumor effects and CatalYm GmbH, or CatalYm, has initiated a Phase 1 clinical trial of CTL-002 in Europe to explore the treatment of cancer in solid tumors. AstraZeneca also has a preclinical program, AZD8853, an antibody targeting GDF15, and CatalYm has an additional discovery program targeting the GDF-15 pathway.

The current standard of care for first-line metastatic pancreatic cancer is chemotherapy with gemcitabine and Nab-paclitaxel or a combination chemotherapy regimen referred to as FOLFIRINOX. No new treatments have been FDA-approved for this population since Abraxane® (paclitaxel protein bound), or Nab-paclitaxel, in 2013 and several programs have failed in Phase 3 development in recent years. We are aware of three programs in Phase 3 trials in combination with chemotherapy in first-line metastatic pancreatic cancer: Novartis' NIS793, a monoclonal antibody targeting transforming growth factor beta, or TGFβ, FibroGen Inc.'s pamrevlumab targeting connective tissue growth factor, and Novocure GmbH's Tumor Treating Fields device. Earlier in the pipeline, over 50 therapies are in Phase 1 and Phase 2 trials for pancreatic cancer, spanning multiple mechanisms of action, including immune checkpoint inhibitors, cancer vaccines, tyrosine kinase inhibitors and chemokine receptor antagonists.

Therapeutic Area: Retinal Diseases

Geographic Atrophy Disease Overview

Geographic atrophy, or GA, is an advanced form of age-related, dry macular degeneration characterized by progressive retinal degeneration associated with irreversible loss of vision and is a major cause of blindness for elderly patients. GA afflicts over one million patients in the United States and approximately five million patients worldwide. 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. GA disease progression, and the patient's accompanying visual decline, can have significant 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 and loss of independence. 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. There are currently no medicines approved by the FDA or the EMA for the treatment of GA.

NGM621: A Potential Treatment for Geographic Atrophy

NGM621 is a proprietary humanized Immunoglobulin 1, or IgG1, monoclonal antibody engineered to potently bind to, and be a long-acting inhibitor of, complement C3 activity. Human genetics and histopathological

data strongly suggest that overactivation of the complement system is linked to the development and progression of GA and causes chronic inflammation, cell injury and death of retinal photoreceptors, RPE and choriocapillaris, leading to irreversible vision loss. The evidence suggests that variants in the complement pathway account for the majority of the known genetic risk for GA. In humans, histopathological analysis of eyes afflicted with GA show a deposition of complement proteins, including C3, on and around photoreceptors and RPE cells preceding their degeneration. In addition, encouraging preclinical and clinical data support inhibition of complement C3 as a promising therapeutic strategy in GA.

Complement C3 is the most upstream point of convergence for all three main complement activation pathways, the classical, lectin and alternative pathways, and acts as a key substance to promote the complement cascade downstream activation. NGM621 inhibits complement activation at the level of C3, which affords the opportunity to block an array of potentially detrimental downstream effects.

NGM621 is within the scope of our current collaboration with Merck, and Merck has a one-time option to license NGM621 and its related compounds upon completion of the Phase 2 CATALINA trial described below (either alone or bundled with all of the other ophthalmology compounds and their respective related compounds included within the scope of the current collaboration with Merck). See "—Our Collaboration with Merck."

In February 2022, NGM621 received Fast Track designation from the FDA for GA secondary to age-related macular degeneration.

Clinical Development of NGM621

NGM621 is being tested in the ongoing Phase 2 CATALINA clinical trial to evaluate its effects on disease progression in patients with GA. In 2021, we completed enrollment in the CATALINA trial, enrolling 320 patients. The CATALINA trial was designed 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 when given every four weeks or every eight weeks via IVT injections compared to sham control. Patients are 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 then monitored for an additional four weeks upon treatment completion for a total study duration of 56 weeks.

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. We expect to report topline data from the CATALINA trial in the fourth quarter of 2022. We plan to use the CATALINA trial results and guidance from the FDA to inform NGM621 Phase 3 planning and design.

Data from a Phase 1 trial we conducted showed that NGM621 was well tolerated, with no patients experiencing serious adverse events, or SAEs, drug-related adverse events, intraocular inflammation, endophthalmitis or choroidal neovascularization. Ocular adverse events observed were mild in severity and representative of those commonly associated with IVT injections. No vision-related safety signals were detected.

NGM621 Patent Portfolio

As of December 31, 2021, we owned one issued United States patent covering NGM621, and the product and related compositions-of-matter and methods of use are disclosed and claimed in other patent applications pending in the United States and in multiple jurisdictions outside of the United States. The current patent and any patent that may issue from any of the pending applications would be expected to expire no earlier than 2039, not including any patent term adjustments and any patent term extensions.

Geographic Atrophy Competition

Current Treatments

There are currently no medicines approved by the FDA or the EMA for the treatment of 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 age-related macular degeneration, or 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

Given the large market opportunity in GA, there are multiple programs 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 and different modes of action. Most treatment approaches for GA have focused on reducing the rate of GA lesion area progression, as assessed by retinal imaging. For the complement-targeted approaches, some therapeutics focus on inhibiting key points in the complement pathway with targeted inhibitors, while others are replacing regulatory proteins that modulate the complement cascade activity. Additionally, the product administration approaches vary and include oral pills, subcutaneous injections, IVT injections and surgical approaches like gene therapy. 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.

Multiple complement inhibition therapies are under clinical evaluation in patients with GA, although to date no GA treatment has received regulatory approval from the FDA or the EMA. Apellis Pharmaceuticals, Inc., or Apellis, recently presented top-line results from two Phase 3 clinical trials of its product candidate, pegcetacoplan (an anti-complement C3 PEGylated peptide), in patients with GA secondary to AMD. One trial met the primary endpoint of significantly reducing GA progression at a one-year time point in the pegcetacoplan arm versus the sham arm, while the other trial did not meet its primary endpoint. Apellis reported that it plans to submit a new drug application for pegcetacoplan for GA to the FDA in the first half of 2022 that will include its statistically significant Phase 2 results as supportive of approval. IVERIC bio, Inc.'s, or IVERIC's, Zimura®, a PEGylated aptamer inhibitor of complement C5, completed a Phase 2/3 clinical trial that demonstrated statistically significant reductions in the rate of GA lesion area growth in the Zimura arm versus the sham arm. IVERIC is in a second confirmatory Phase 3 trial of Zimura and expects Phase 3 trial results in the second half of 2022. Other agents in development 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, GEM103; and Gyroscope Therapeutics Holdings plc's gene therapy GT-005, replacing complement factor I in patients with genetically defined GA in Phase 2 development; and Alexion Pharmaceuticals, Inc.'s ALXN2040 and Annexon, Inc.'s ANX007, both in Phase 2 development.

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 (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: Liver and Metabolic Diseases

We have spent more than a decade discovering and developing a portfolio of clinical-stage drug candidates that target various forms of cardio-metabolic and liver diseases, most specifically nonalcoholic steatohepatitis, or NASH. We have identified multiple hormonal pathways of interest and our drug candidates stem from novel insights we have made in the regulation of cardio-metabolic processes and liver function.

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 approximately 35% 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.

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.

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 stages 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 NASH patient is approximately seven years.

Our NASH Product Candidates

Aldafermin

Aldafermin is an engineered analog of human hormone fibroblast growth factor 19, or FGF19, that is administered through a once-daily subcutaneous injection using a pre-filled, single-use, glass syringe. Aldafermin has demonstrated the ability to rapidly improve NASH and reverse liver fibrosis in preclinical and clinical studies. FGF19 is a highly specific and potent regulator of liver fat metabolism and bile acid synthesis that we believe is responsible for some of the beneficial effects of gastric bypass surgery on NASH.

Aldafermin is wholly-owned by us.

Clinical Development of Aldafermin

To date, aldafermin has been dosed in over 700 patients and healthy volunteers across multiple liver and metabolic diseases, including more than 300 patients with NASH. In May 2021, we announced that the Phase 2b ALPINE 2/3 trial of aldafermin in patients with NASH and liver fibrosis stage 2 or 3, or F2 or F3, did not meet its primary endpoint evaluating a dose response at week 24 on liver fibrosis improvement by >1 stage with no worsening of NASH. As a result, we decided to suspend further development of aldafermin in patients with F2/F3 NASH, allowing for the reallocation of resources to advancing our other programs.

Aldafermin remains in Phase 2b development for the treatment of patients with compensated NASH cirrhosis (liver fibrosis stage 4, or F4). The Phase 2b ALPINE 4 clinical trial is designed to evaluate the treatment effect of aldafermin over 48 weeks in a population of patients with NASH with F4 liver fibrosis and well-compensated cirrhosis. We initiated the ALPINE 4 trial in February 2020 and completed enrollment of 160 patients across 80 sites in the United States, Europe, Hong Kong and Australia in January 2022. The objective of the trial is to evaluate whether fibrosis regression can be achieved in compensated cirrhotic patients with NASH, for whom liver mortality rates are high and liver transplant is the only option. We recently updated the design of the ALPINE 4 trial, elevating the Enhanced Liver Fibrosis, or ELF, test, a reproducible, quantitative non-invasive liver prognostic test that evaluates liver fibrosis and correlates to liver-related outcomes, to be the primary endpoint for the trial. The ELF test is a composite blood test measuring the presence of three biomarkers associated with liver matrix metabolism. Liver biopsy data will also be measured and reported as a secondary endpoint upon completion of the trial. We expect to report topline data from the ALPINE 4 trial in the first half of 2023.

Aldafermin has been generally well tolerated in clinical trials to date. In patients with NASH receiving various doses of aldafermin (between 0.3 mg and 6 mg) in our completed Phase 2 trials, the most common reported adverse events occurring in more than 10% 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, abdominal pain, injection site reaction, vitamin D deficiency, injection site symptoms (such as pruritus, erythema or swelling), cough, fecal color discoloration, cholesterol and low-density lipoprotein cholesterol increase, with the majority of adverse events classified as mild or moderate. SAEs included one case of acute pancreatitis, as well as pleurisy, vertigo, headache, hypertension, cardiac arrest, chest pain, pneumonia, kidney mass, rectal bleeding and liver biopsy complication, none of which were considered related to study drug.

In patients with NASH and stage 2 or 3 liver fibrosis receiving various doses of aldafermin (between 0.3 mg and 3 mg) in the completed Phase 2b ALPINE 2/3 trial, topline results showed that the most common reported adverse events occurring in more than 10% of patients across all four cohorts included diarrhea, nausea, headache, upper abdominal pain, injection site erythema, constipation and sinusitis with the majority of adverse events classified as mild or moderate. SAEs included osteoarthritis, uterine cancer, suicide attempt, small bowel obstruction, cholecystitis, cardiac hypertrophy and obesity, none of which were considered related to study drug.

Aldafermin Patent Portfolio

As of December 31, 2021, we owned 27 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 and multiple foreign jurisdictions including Europe. 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: 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 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. 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 November 2018, Merck exercised its option for a license to conduct research upon, develop and commercialize MK-3655 and other FGFR1c/KLB agonists. As a result, Merck is responsible for further MK-3655 development activities. See "—Our Collaboration with Merck."

Clinical Development of MK-3655

At the end of 2020, Merck initiated a Phase 2b clinical trial of MK-3655 for the treatment of patients with NASH with F2 or F3 fibrosis and is continuing to enroll patients in the trial. The trial is a multi-center, double-blind, placebo-controlled trial administering 50 mg, 100 mg and 300 mg doses of MK-3655 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 trial is NASH resolution without worsening of fibrosis at 52 weeks.

In the Phase 1 and Phase 1b clinical trials we conducted, MK-3655 was generally well tolerated and data has shown the agent is capable of reducing liver fat content and improving metabolic biomarkers in obese, insulin resistant subjects with NAFLD after a single dose. In the Phase 1 trial, there were two SAEs reported in the MK-3655 treatment group, lower gastrointestinal, or 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. In the Phase 1b trial, 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.

MK-3655 Patent Portfolio

As of December 31, 2021, we owned three issued patents in the United States, which were licensed to Merck in connection with Merck's exercise of its license option for MK-3655, 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 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

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. 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 Inc.'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 Pharmaceuticals Ltd.; Inventiva SA's pan-peroxisome proliferator-activated receptors (PPAR) agonist, lanifibranor; Akero Therapeutics, Inc.'s efruxifermin and 89 Bio Inc.'s BIO89-100, both analogs of fibroblast growth factor 21 (FGF21); and Genentech/Roche's BFKB8488A, an FGFR1c/KLB bi-specific agonistic antibody.

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, or FXR, agonists, such as Intercept Pharmaceuticals, Inc.'s, or Intercept's, obeticholic acid. A new drug application for obeticholic acid was filed with the FDA by Intercept in September 2019 and received a complete response letter in June 2020. In December 2021, Intercept withdrew its marketing authorization application from the EMA. Intercept has indicated that it is in the process of generating additional efficacy and safety data and that it intends to resubmit its new drug application for obeticholic acid.

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 meaningful 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.

Our Collaboration with Merck

Collaboration Overview

In 2015, we entered into a research collaboration, product development and license agreement with Merck, which, together with amendments made prior to June 30, 2021, is referred to as the Original 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 us with input from Merck. The original research phase of the collaboration was for five years and was extended for an additional two years by Merck through March 2022. Under the Original Collaboration Agreement, upon the completion of each proof-of-concept clinical trial under the program, Merck would have a one-time option to obtain a worldwide, exclusive license to the product candidate tested in the trial and compounds related to it, referred to as a License Option. If Merck exercised a License Option and paid the applicable option exercise fee, then it would be solely responsible for any further development and commercialization activities for the licensed compounds and we would have the option, when a licensed compound has advanced to Phase 3 clinical trials, to receive milestones and royalty payments or, in certain cases, to co-fund development and participate in a global cost and profit share arrangement of up to 50%, with an additional option to co-detail any such licensed compounds in the United States. If Merck did not exercise a License Option within the specified time period, then we would be free to develop and commercialize the product candidate tested in the proof-of-concept trial and its related compounds independently or with third-party partners, subject to an obligation to make low single-digit royalty payments to Merck.

Under the terms of the Original Collaboration Agreement, Merck paid us an upfront cash licensing fee of $94.0 million, purchased approximately $106.0 million of our Series E convertible preferred stock, and reimbursed us for approximately $427.9 million of research and development expenses that we incurred over the first six years of the collaboration under the Original Collaboration Agreement. In addition, in November 2018, Merck exercised its License Option under the Original Collaboration Agreement for MK-3655 (and its related compounds). Merck is currently conducting a Phase 2b randomized, double-blind study of MK-3655 in patients with NASH with F2 or F3 liver fibrosis.

On June 30, 2021, we entered into an amended and restated research collaboration, product development and license agreement with Merck, or the Amended Collaboration Agreement, replacing the Original Collaboration Agreement and extending the research phase of the collaboration, but with a narrower scope than in the Original Collaboration Agreement. Under the Amended Collaboration Agreement, the collaboration is focused primarily on the identification, research and development of collaboration compounds directed to targets of interest to Merck in the fields of ophthalmology and cardiovascular or metabolic, or CVM, disease, including heart failure. The ophthalmology compounds in the collaboration include NGM621 (and its related compounds) and compounds directed against two other undisclosed ophthalmology targets (and their related compounds). The collaboration scope also includes certain laboratory testing and other activities on compounds that are directed to one of up to two undisclosed targets outside of the fields of ophthalmology and CVM disease, or the Lab Programs.

Under the Amended Collaboration Agreement, Merck continues to have a License Option to each continuing collaboration compound (and its related compounds); the specific License Option exercise point and the fees to be paid upon exercise of each License Option are described below. For each program for which Merck exercises its License Option, Merck is responsible, at its own cost, for any further development and commercialization activities for the licensed compounds and we have the option, when a licensed compound has advanced to Phase 3 clinical trials, to receive milestones and royalty payments or, in certain cases, to co-fund development and participate in a global cost and profit share arrangement of up to 50%. The parties' rights and obligations remain the same with respect to MK-3655 and its related FGFR1c/KLB agonists.

Under the Amended Collaboration Agreement, Merck is providing significantly more limited annual research and development funding beginning in 2022 and we have certain obligations to conduct research and development related to collaboration compounds that will not be reimbursed by Merck.

As a result of entering into the Amended Collaboration Agreement, we have the right to independently research, develop and commercialize all the clinical, preclinical and research assets that we researched or developed under the Original Collaboration Agreement that are now outside the narrower scope of the collaboration, including NGM707, NGM831, NGM438 and NGM120, subject to the payment to Merck of low single-digit royalties on commercial sales of any resulting products. We also have full rights to all future programs we pursue that fall outside of the scope of the specific therapeutic areas and programs included in Amended Collaboration Agreement.

Description of Amended Collaboration Agreement

The Original Collaboration Agreement contemplated an initial five-year term for the research and early development phase of the collaboration, which was extended for two additional years through March 16, 2022 by Merck's exercise of an extension option. Under the Amended Collaboration Agreement, the research and early development phase for the ophthalmology programs will continue until March 31, 2024 unless Merck exercises the Bundle Option described below, in which case it will end shortly after Merck exercises the Bundle Option, a decision which is expected to occur in late 2022 or early 2023. The research phase for the CVM-related programs will also continue until March 31, 2024, unless the parties mutually agree to extend the research phase to March 31, 2026. New CVM-related programs may be added to the collaboration if recommended by us and selected by Merck. The research phase for the Lab Programs will end no later than December 31, 2022.

Under the Amended Collaboration Agreement, Merck is providing an aggregate of approximately $125.0 million in research and development funding through March 31, 2024. This includes up to $86.0 million in research and development funding for the four calendar quarters ending March 31, 2022. We were obligated to use commercially reasonable efforts to expend $35.0 million of such $86.0 million in funding on programs of interest to Merck remaining in the scope of the collaboration during such four calendar quarters and we were permitted to use the remainder of the $86 million in funding provided by Merck during such four calendar quarters to advance those product candidates from the Original Collaboration Agreement for which Merck's License Option was terminated upon entry into the Amended Collaboration Agreement.

For the period starting on April 1, 2022 and ending on March 31, 2024, Merck will provide up to $20.0 million of research and development funding for the ophthalmology programs (other than NGM621), the CVM-related programs and the Lab Programs. If the parties mutually agree to extend the research phase for the CVM-related programs from March 31, 2024 to March 31, 2026, then Merck will provide up to a total of $20.0 million in research and development funding during the additional two years of the CVM program research phase. Merck will also fund certain research and development costs related to NGM621 in an amount expected to be up to approximately $20.0 million, until the earlier of Merck's decision to exercise, or not to exercise, its License Option with respect to NGM621 alone or as part of the Bundle Option or, March 31, 2024.

In addition, we have certain obligations to conduct research and development related to collaboration compounds that will not be reimbursed by Merck. We are required to use commercially reasonable efforts to

research and develop a specific product candidate directed to an ophthalmology target to be ready by March 31, 2023 for starting investigational new drug application-, or IND-, enabling studies, and we are responsible for the cost of such work after March 2022. We will have additional research and development funding obligations under the collaboration of up to $5.0 million or $15.0 million in the event that Merck, as described in greater detail below, exercises its License Option to NGM621 alone or bundled with the other continuing ophthalmology compounds, respectively, and pays us the applicable option exercise fee. We also may spend more than the amounts we will be reimbursed by Merck for activities related to collaboration compounds, including certain NGM621 costs necessary to avoid delays in Phase 3 readiness.

During the three-month period before the end of the research and early development phase for the ophthalmology programs and the research phase for the CVM-related programs, Merck has the right to review the product candidates from each applicable program and to elect to have research and development activities continue on them under the collaboration for an additional period, referred to as a Tail Period. If Merck makes such an election, then the applicable Tail Period will begin at the end of the research, or research and early development, phase for the applicable program and will end on the earlier of achievement of the License Option exercise point or three years, except that in certain circumstances a Tail Period may continue beyond three years if the License Option exercise point has not been achieved by such time. Merck may elect for us to conduct research and early development on ophthalmology programs during the applicable Tail Period, if any, with funding from Merck that is significantly reduced from Merck's funding levels during the research and early development phase. Alternatively, Merck may conduct such work itself or engage third-party contractors to do so, in each case at Merck's expense. All research and development work on CVM-related programs during the applicable Tail Period, if any, will be conducted by Merck or its third-party contractors at Merck's expense. Each Lab Program will enter a Tail Period if Merck elects to continue work on it after we complete specified laboratory and other activities.

Under the Amended Collaboration Agreement, Merck retains License Options to obtain an exclusive, worldwide license, on specified terms, to each collaboration compound (and its related compounds) that remains within the scope of the continuing collaboration. Merck generally has a one-time right to exercise its License Option for any product candidate when we or Merck achieve the specified License Option exercise point. The License Option exercise point for collaboration compounds that are directed to ophthalmology targets, including NGM621 (and its related compounds) and all of the collaboration compounds from two other ophthalmology programs directed against undisclosed ophthalmology targets (and their related compounds), is after the completion of the first proof-of-concept clinical trial for such collaboration compound. In addition, upon the completion of the first proof-of-concept clinical trial for NGM621, Merck will have an additional one-time option to license all of the ophthalmology collaboration compounds together, referred to as the Bundle Option, even though no product candidate from the two other ophthalmology programs is expected to have completed human proof-of-concept trials at such time. If Merck does not exercise this one-time Bundle Option for all of the ophthalmology collaboration compounds, it may nevertheless exercise its regular License Option with respect to NGM621 (and its related compounds) at such time, and it may also exercise its regular License Option for each of the other two ophthalmology programs if a collaboration compound from such program completes a human proof-of-concept trial. If Merck exercises the Bundle Option, it will pay us an option exercise fee of either $40.0 million or $45.0 million, depending upon the stage of development of one of the two earlier-stage ophthalmology programs included in the Bundle Option. If Merck does not exercise the Bundle Option, Merck may nevertheless exercise its regular License Option with respect to NGM621 (and its related compounds) at such time, in which case it will pay us an option exercise fee of $20.0 million, and when a product candidate from either of the other two ophthalmology programs completes a human proof-of-concept trial, Merck may exercise its License Option for such product candidate (and its related compounds) and pay a $20.0 million option exercise fee upon each such exercise.

The License Option exercise point for a collaboration compound from the CVM-related programs or the Lab Programs will be the designation by Merck of such collaboration compound as a research program development candidate that Merck intends to progress into preclinical development. Upon Merck's exercise of a License Option for any CVM-related program or Lab Program, Merck will pay us an option exercise fee of $6.0 million and we will be eligible to receive a milestone payment of $10.0 million if Merck subsequently completes a proof-of-concept trial for a product candidate from such program.

If Merck exercises its License Option to a product candidate and its related compounds, referred to as a Licensed Program, we will have the option to receive milestones and royalty payments or, in certain cases, prior to Merck initiating any Phase 3 clinical trial of such licensed compound, to co-fund development and participate in a global cost and profit share arrangement of up to 50%, with an additional option to co-detail any such licensed compound in the United States. If we do not elect to exercise our cost and profit share option for a particular licensed compound, we are eligible to receive an aggregate of up to $469.0 million in milestone payments upon the achievement of specific clinical development and regulatory events, commercial milestone payments of up to

$125.0 million and royalties from low-double digit to mid-teen percentages of worldwide net sales of such licensed compound.

Merck will be responsible, at its own cost, for all development and commercialization of product candidates from each Licensed Program, subject to our options to cost and profit share worldwide, and to co-detail those compounds in the United States as described above. If Merck does not exercise its License Option with respect to a particular candidate and its related compounds within the applicable time period, in most instances we retain all rights to research, develop and commercialize that candidate and those compounds on a worldwide basis, either alone or in partnership with a third party, subject to the payment to Merck of low single-digit royalties on commercial sales of any resulting products.

Under the Amended 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. Merck's research license for its own small molecule program will become non-exclusive if Merck does not exercise its option to a product candidate against a target at its option exercise point, but Merck will retain an exclusive license to any small molecule compounds that it has already 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 addition to the options and exclusive licenses that we granted or are obligated to grant to Merck, we have the following exclusivity obligations to Merck under the Amended Collaboration Agreement. During the applicable research phase and Tail Period, if any, for the ophthalmology programs, CVM-related programs and Lab Programs, we may not directly or indirectly research, develop, manufacture or commercialize, outside of our collaboration with Merck, any product with specified activity against any target that is being researched or developed under the applicable programs and, if Merck exercises its License Option for a 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 Licensed Program for so long as Merck's license to it remains in effect. In addition, we are prohibited from directly or indirectly researching, developing or commercializing any product for the treatment of heart failure with preserved ejection fraction, or HFpEF, during the research phase for the CVM-related programs.

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

Either we or Merck may terminate the Amended Collaboration Agreement with respect to a specific Licensed Program or any particular licensed small molecule compound 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 Licensed Program as a result of our uncured material breach, then we would lose our option to participate in a global cost and profit share 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 candidates arising from the relevant Licensed Program. If Merck terminates a licensed small molecule compound program 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.

If we terminate a Licensed Program for uncured breach, or if Merck terminates 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 and grant us an exclusive license under Merck's intellectual property related to the terminated program, subject to the payment of a modest royalty back to Merck.

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 we undergo any change in control, Merck has the right to terminate the Amended Collaboration Agreement, in its entirety, or only with respect to certain of the research programs then being pursued. If our change in control involves another pharmaceutical company with significant annual sales of pharmaceutical products, Merck would have certain additional rights that could only be exercised within the first year following such change in control, including, but are not limited to limiting our right to cost and profit share and terminating our co-detailing rights.

If our acquirer is, at the time of the change of control, pursuing research, development, commercialization or manufacturing of, or otherwise has any rights to, any compounds that modulate a target that is the subject of a Licensed Program, Merck also has certain rights, unless our acquirer elects to cease those research, development and commercialization activities, including but not limited to terminating our co-detailing rights with respect to the relevant 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 is, at the time of the change in control, 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, Merck has the right to require us to either provide information demonstrating that the competing program does not actually modulate the relevant target in the same manner as our candidate, contribute the competing program to our collaboration with Merck or divest the competing program.

Equity Investment by Merck

Concurrently with the execution of our Original 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, concurrently with the closing of our initial public offering 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. Merck owned approximately 16.6% of our outstanding shares as of December 31, 2021.

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 and Biotechpharma UAB. 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.

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 cancer, retinal diseases and liver and metabolic diseases, 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, Mirum, Nalpropion, NextCure, North Sea, Promethera, Salix, Scholar Rock, Seal Rock, Terns, Tiziana, Tizona, 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 cancer, retinal diseases and liver and metabolic diseases will increase.

For example, Apellis recently reported that it plans to submit a new drug application for pegcetacoplan for GA to the FDA in the first half of 2022. 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 disclosed product candidates face, or may face, see the discussion of specific competition for each product candidate see "—Key Therapeutic Areas and Pipeline Programs."

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-of-matter, 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, 2021, our patent portfolio includes over 500 patents and applications, including over 50 issued U.S. patents and over 30 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. For more information regarding the patents and patent applications relating to our seven most advanced product candidates, see the discussion of intellectual property protection for each product candidate in "—Key Therapeutic Areas and Pipeline Programs." 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 that 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.

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 protected by patent.

See "Risk Factors - Risks Related to Our Intellectual Property" for information regarding the risks related to our intellectual property.

Licensing Arrangements

Horizon License

In September 2019, we entered into a license agreement with Horizon, or the Horizon License, in which we obtained a non-exclusive, non-transferable and non-sublicensable license to use their proprietary GS knockout CHO K1 manufacturing cell line. 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, 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 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, a 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, pharmacology, pharmacokinetics 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 current Good Clinical Practices, or 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 institutional review board, or 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.

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 biologics license application, 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. 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 current Good Manufacturing Practices, or 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 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 cGCPs. 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.

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. 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, the 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 (ROTR) 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 its marketing application if it requests such a voucher in its original marketing application and meets 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. 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.

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.

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. 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. 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 Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively referred to as the ACA, to impose 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.

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.

HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and its implementing regulations, imposes requirements on covered entities (including certain health care providers, health plans and health care clearinghouses, business associates and their covered subcontractors) relating to the privacy, security and transmission of individually identifiable health information. HIPAA may be enforced by several federal agencies as well as state attorneys general. 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.

Our physician-administered products, once approved, may be eligible for coverage under Medicare through Medicare Part B. 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, and would be subject to those requirements as well.

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.

Additionally, the federal Physician Payments Sunshine Act, or the Sunshine Act, as amended, 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 doctors, dentists, optometrists, podiatrists and chiropractors), other health care professionals (such as physician assistants and nurse practitioners) and teaching hospitals, as well as information regarding ownership and investment interests held by physicians and their immediate family members.

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.

Privacy and Data Security Laws and Compliance Obligations

We are subject to certain U.S. federal and state, as well as foreign, data privacy and security laws, regulations and other legal obligations. The regulatory framework with respect to data privacy and security is stringent and constantly evolving. For example, in addition to laws such as HIPAA that govern the processing of health information, we are or may become subject to numerous other data privacy and security laws and legal obligations, which may include laws such as the California Consumer Privacy Act of 2018, or CCPA, the European Union's, or EU's, General Data Protection Regulation 2016/679, or EU GDPR and the EU GDPR as it forms part of United Kingdom, or UK, law, or UK GDPR. These laws and obligations impose on subject entities extensive, costly and complex compliance obligations, which may conflict or be inconsistent with one another, and violations may result in significant fines, penalties and other adverse consequences. See "Risk Factors – Risks Related to Our Business and Industry" for additional information about the privacy and data security risks we may face, including in relation to the laws and regulations to which we are or may become subject.

European Union Drug Development

In the EU, 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 EU are currently regulated by Clinical Trials Regulation (EU) No 536/2014, which went into effect on January 31, 2022. The regulation, which is directly applicable in all EU Member States, overhauls the current system of approvals for clinical trials in the EU in an effort to simplify and streamline the approval of clinical trials in the EU.

European Union Drug Review and Approval

In the European Economic Area, or EEA, which consists of the 27 Member States of the EU, 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 EU 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, autoimmune and other immune dysfunctions and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU.

National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member State 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 MA governed by EU rules may be granted only to a Marketing Authorization Applicant, or MAA, that is established within the EEA.

In principle, an MA has an initial validity of five years. The MA may be renewed after five years on the basis of a re-evaluation of the risk-benefit balance by the EMA or by the competent authority of the EU member state in which the original MA was granted. The European Commission or the competent authorities of the EU member states may decide, on justified grounds relating to pharmacovigilance, to proceed with one further five year renewal period for the MA. Once subsequently definitively renewed, the MA is valid for an unlimited period. Any authorization that is not followed by the actual placing of the medicinal product on the EU market (in case of centralized procedure) or on the market of the authorizing EU member state within three years after authorization ceases to be valid (the so-called sunset clause).

Innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the Priority Medicines, or PRIME, scheme, which provides incentives similar to the breakthrough therapy designation in the U.S.

In the EU, a “conditional” MA may be granted in cases where all the required safety and efficacy data are not yet available. The conditional MA is subject to conditions to be fulfilled for generating the missing data or ensuring increased safety measures. It is valid for one year and must be renewed annually until all related conditions have been fulfilled.

An MA may also be granted “under exceptional circumstances” where the applicant can show that it is unable to provide comprehensive data on the efficacy and safety under normal conditions of use even after the product has been authorized and subject to specific procedures being introduced. These circumstances may arise in particular when the intended indications are very rare and, in the state of scientific knowledge at that time, it is not possible to provide comprehensive information, or when generating data may be contrary to generally accepted ethical principles. An MA granted in exceptional circumstances is reserved to medicinal products intended to be authorized for treatment of rare diseases or unmet medical needs for which the applicant does not hold a complete data set that is required for the grant of a standard MA.

Data and Market Exclusivity

The EU provides opportunities for data and market exclusivity related to MAs. Upon receiving an MA, innovative medicinal products are generally entitled to receive eight years of data exclusivity and ten years of market exclusivity. Data exclusivity, if granted, prevents regulatory authorities in the EU from referencing the innovator’s data to assess a generic application or biosimilar application for eight years from the date of authorization of the innovative product, after which a generic or biosimilar MAA can be submitted, and the innovator’s data may be referenced. The market exclusivity period prevents a successful generic or biosimilar applicant from commercializing its product in the EU until ten years have elapsed from the initial MA of the reference product in the EU. The overall ten-year period may, occasionally, be extended for a further year to a maximum of eleven years if, during the first eight years of those ten years, the MA holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies. However, there is no guarantee that a product will be considered by the EU’s regulatory authorities to be a new chemical/biological entity, and products may not qualify for data exclusivity.

Pediatric Development

Regulation (EC) No 1901/2006 provides that all MAAs for new medicinal products have to include the results of trials conducted in the pediatric population, in compliance with a pediatric investigation plan, or PIP, agreed with the EMA’s Pediatric Committee (PDCO). The PDCO can grant a deferral of the obligation to implement some or all of the measures provided in the PIP until there are sufficient data to demonstrate the efficacy and safety of the product in adults. The obligation to provide pediatric clinical trial data can be waived entirely by the PDCO when these data are not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the MA is obtained in all EU member states and study results are included in the product information, even when negative, the product is eligible for a six-month extension to the Supplementary Protection Certificate (SPC) if any is in effect at

the time of authorization or, in the case of orphan medicinal products, a two-year extension of orphan market exclusivity.

Post-Approval Requirements

Where an MA is granted in relation to a medicinal product in the EU, the holder of the MA is required to comply with a range of regulatory requirements applicable to the manufacturing, marketing, promotion and sale of medicinal products.

Similar to the United States, both MA holders and manufacturers of medicinal products are subject to comprehensive regulatory oversight by the EMA, the European Commission and/or the competent regulatory authorities of the individual EU member states. The holder of an MA must establish and maintain a pharmacovigilance system and appoint an individual qualified person for pharmacovigilance who is responsible for oversight of that system. Key obligations include expedited reporting of suspected serious adverse reactions and submission of periodic safety update reports, or PSURs.

All new MAAs must include a risk management plan, or RMP, describing the risk management system that the company will put in place and documenting measures to prevent or minimize the risks associated with the product. The regulatory authorities may also impose specific obligations as a condition of the MA. Such risk-minimization measures or post-authorization obligations may include additional safety monitoring, more frequent submission of PSURs or the conduct of additional clinical trials or post-authorization safety studies.

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 EU. The provision of benefits or advantages to physicians is governed by the national anti-bribery laws of EU Member States, and infringement of these laws could result in substantial fines and imprisonment. Payments made to physicians in certain EU 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.

Regulation in the United Kingdom Following Brexit

The UK's withdrawal from the EU on January 31, 2020, commonly referred to as Brexit, has created significant uncertainty concerning the future relationship between the UK and the EU. The Medicines and Healthcare products Regulatory Agency (MHRA) is now the UK's standalone regulator.

Among the changes resulting from Brexit is that Great Britain (England, Scotland and Wales) will be treated as a third country. Northern Ireland will, with regard to EU regulations, continue to follow the EU regulatory rules.

Brexit may influence the attractiveness of the UK as a place to conduct clinical trials. Harmonization of the current EU regulatory environment for clinical trials will increase with the entry into application of the Clinical Trials Regulation on January 31, 2022. It is currently unclear to what extent the UK will seek to align its regulations with the EU. A decision by the UK not to closely align its regulations with the new approach that will be adopted in the EU following entry into application of the Clinical Trials Regulation in January 2022 may have an effect on the cost of

conducting clinical trials in the UK as opposed to other countries and/or make it harder to seek an MA in the EU for our product candidates on the basis of clinical trials conducted in the UK.

From January 1, 2021, an applicant for a centralized procedure MA can no longer be established in the UK. After this date, companies established in the UK cannot use the centralized procedure and instead must follow one of the UK national authorization procedures to obtain an MA to market products in the UK.

Rest of the World Regulation

For other countries outside of the EU 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. 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

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.

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.

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. 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. 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 those governing enrollment in federal healthcare programs, 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 and annual fees based on pharmaceutical companies' share of sales to federal healthcare programs.

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. On June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Thus, the ACA remains in effect in its current form, although it may be subject to judicial or Congressional challenges in the future. Additionally, on January 28, 2021, President Biden issued an executive order instructing 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. 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.

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 2031 unless additional Congressional action is taken.

However, COVID-19 relief legislation suspended the 2% Medicare sequester from May 1, 2020 through March 31, 2022. Under current legislation the actual reduction in Medicare payments will vary from 1% in 2022 to up to 3% in the final fiscal year of this sequester.

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. For example, in July 2021, the Biden administration released an executive order, "Promoting Competition in the American Economy," with multiple provisions aimed at prescription drugs. In response to President Biden's executive order, on September 9, 2021, the United States Department of Health and Human Services, or HHS, released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. No legislation or administrative actions have been finalized to implement these principles. 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, 2021, we had 225 employees, of which approximately 147 (65%) were engaged in research and development activities, 83 hold Ph.D. and/or M.D. degrees and an additional 55 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 2021, particularly as the COVID-19 pandemic necessitated remote work for most employees, we continued to experience a higher-than-normal rate of employees leaving the company to pursue other opportunities. This turnover was mitigated by a robust recruiting

effort. We maintain a comprehensive dashboard of measurements, including recruitment productivity, diversity, equity and inclusion metrics, employee engagement scores, total rewards benchmarking, participation rates and satisfaction scores for internal training, turnover rates and exit interview results, 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 and related management training. 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 throughout the year to provide what we consider 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. Every year, we undertake a detailed review of our compensation by position and level and make adjustments necessary to ensure that we continue to provide competitive compensation. Our hiring practices and annual compensation reviews are designed to ensure 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 to have a diverse, equitable and inclusive workforce – not just because it is the right thing to do, but because we believe this is key to our long-term success. As of December 31, 2021, NGM employed 113 women (50%) and 112 men (50%), and 56% 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 41% women and 27% 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: awareness and understanding; diverse candidate pipelines; community outreach; advocacy and career advancement; and business impact. Beginning in 2020, we have focused on anti-black racism. Our 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 exercises in conjunction with Black History Month and conducting a survey to understand employee sentiment around race-related issues to establish a baseline for tracking future progress. In 2021, we implemented a pilot internship program and specific efforts to provide the company with a more diverse candidate pipeline. In addition to internal efforts, our research employees volunteered to teach elementary school students various topics in biology. We are also continuing our practice of quantifying racial, ethnic and gender diversity within completed clinical studies, and in 2021 began 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, summer family picnic, Thanksgiving potluck and holiday white elephant party, among many others. In 2020, we shifted to a virtual setting for many employees and continued to emphasize communication and employee engagement through quarterly all-employee virtual town halls; weekly emails from the CEO through the first year of the pandemic; 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.

We survey our employees each year to measure their level of engagement at NGM. Our employee engagement score improved in 2021 over 2020 and affirmed that we are focusing our engagement efforts in the right areas. These surveys provide rich feedback each year that helps us to continue to grow our culture and make NGM a great place to work.

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 administer daily symptom screenings and contact tracing, and to provide 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, as well as our other filings with the U.S. Securities and Exchange Commission, or SEC. Our business, financial condition, results of operations, stock price 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. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations and the market price of our common stock. 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. As a result, we are not profitable and have incurred losses in each year since commencing operations. Our net losses were $120.3 million, $102.5 million and $42.8 million for the years ended December 31, 2021, 2020 and 2019, respectively. As of December 31, 2021, we had an accumulated deficit of $419.0 million.

We expect to continue to incur significant and increasing research and development, or R&D, and other expenses related to our ongoing operations for the foreseeable future, particularly to fund R&D of, and seek regulatory approvals for, our product candidates. We further expect to incur substantial and increasing operating losses in 2022 and over the next several years as our research, development, manufacturing, preclinical studies, clinical trial and related activities and related expenses increase and we expect our accumulated deficit will also increase significantly in future periods. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenue outside of our collaboration with Merck Sharp & Dohme Corp., or Merck. 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. For example, in May 2021, we announced topline results from our Phase 2b ALPINE 2/3 trial evaluating aldafermin in patients with nonalcoholic steatohepatitis, or NASH, and liver fibrosis stage 2 or 3, or F2 or F3. The study did not meet its primary endpoint, and, as a result, we decided to suspend further development of aldafermin in patients with F2/F3 NASH, allowing for the reallocation of resources to advancing our other programs.

Our ability to generate any 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 and obtain regulatory approval for those 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, and that revenue will be substantially lower beginning in 2022.

We do not have any committed external source of funds, other than pursuant to our ongoing collaboration with Merck, which has provided us with substantial financial support since 2015. However, as described under “Overview of Our Business - Our Collaboration with Merck” in Part I, Item 1 of this Annual Report on Form 10-K, beginning in 2022, the R&D funding we receive from Merck under the collaboration will be substantially lower on an annual and overall basis than the research funding previously provided by Merck due to the narrower scope of the amended and restated research collaboration, product development and license agreement we entered into with Merck on June 30, 2021, or the Amended Collaboration Agreement, which amended and restated our then-existing collaboration agreement with Merck, originally entered into in 2015, which, together with amendments made prior to June 30, 2021, we refer to as the Original Collaboration Agreement.

In this regard, for the period starting on April 1, 2022 and ending on March 31, 2024, Merck is committed to fund up to $20.0 million in R&D funding for the ophthalmology programs (other than NGM621), the cardiovascular or metabolic -, or CVM-, related programs and other smaller laboratory programs subject to the collaboration. Merck is also obligated to fund certain R&D costs related to NGM621 in an amount expected to be up to approximately $20.0 million, until the earlier of Merck's decision to exercise, or not to exercise, its license option with respect to NGM621 and its related compounds (either alone or bundled with all of the other continuing ophthalmology compounds and their respective related compounds) or, March 31, 2024. As a result, beginning in 2022, we will need to devote a substantial amount of our own financial resources to our R&D programs, particularly with respect to our wholly-owned programs and, to a lesser extent, with respect to programs that are within the scope of the current collaboration under the Amended Collaboration Agreement that we are required to fund (and our failure to allocate funding to meet such requirements may be deemed a breach of the Amended Collaboration Agreement). In addition, our funding requirements would increase for any programs that are within the scope of the current collaboration in the event Merck does not elect to license these programs and we decide to continue them, in the event Merck elects to terminate its license to any program it licenses and we decide to continue it or in the event we opt to co-develop any Merck-licensed programs.

Other than our Amended Collaboration Agreement with Merck, which is limited in scope and duration, and may be unilaterally terminated by Merck under certain circumstances, we are not party to any agreements that could provide us with future revenue. Accordingly, we will need to raise significant additional capital and/or we will need to enter into additional collaborations in order to proceed with development through regulatory approval and commercialization of our current and potential future product candidates. Neither may be possible and, as a result, if adequate funds are not available when we need them, we may need to significantly delay, scale back or discontinue development of some or all of our product candidates or scale back or discontinue discovery efforts, which could have a material adverse effect on our business, operating results and prospects, or we may be required to cease operations altogether.

We will need significant additional capital to proceed with development and commercialization of our current and potential future product candidates and our other operations. We may not be able to access sufficient capital on acceptable terms, if at all, and, as a result, we may be required to delay, scale back or discontinue development of such product candidates.

As an R&D 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, both in the short and the long term, and the amount of funding we will need depends 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 Merck exercises its option to license product candidates upon completion of human proof-of-concept studies or at the earlier license option point as specified in the Amended Collaboration Agreement for each such candidate;
- whether Merck terminates the research phase of the collaboration under pre-specified circumstances set forth in the Amended Collaboration Agreement or terminates a program that it has licensed;
- the amount of our financial resources that we will need to devote to our obligations under the Amended Collaboration Agreement;
- the outcome, timing and cost of seeking and obtaining regulatory approvals from the U.S. Food and Drug Administration, or FDA, and comparable foreign health 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 cost and timing of selecting, auditing and potentially validating a manufacturing site for later-stage clinical and commercial-scale manufacturing;
- 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 potentially acquiring, licensing or investing in additional businesses, products, product candidates and technologies; and
- the cost of establishing sales, marketing and distribution capabilities for any of our product candidates for which we may receive regulatory approval and that we determine to commercialize ourselves or in collaboration with partners.

We believe that our existing cash, cash equivalents and short-term marketable securities will be sufficient to fund our operations for at least the twelve months from the date of filing of this Annual Report on Form 10-K. 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.

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, product collaborations, strategic alliances, licensing arrangements or a combination of these potential financing sources. Additional capital may not be available in sufficient amounts, on reasonable terms or when we need it, if at all. Our ability to raise additional capital through public or private equity or debt offerings 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, and the biotechnology industry specifically, resulting from, among other things, the continuing effects of the COVID-19 pandemic and geopolitical instability.

If adequate funds are not available from public or private equity or debt offerings on acceptable terms when needed, in order to continue the development of product candidates outside of the scope of the collaboration with Merck we may need to:

- seek strategic alliances for R&D 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 could require us to relinquish, or license, on potentially unfavorable terms, our rights to intellectual property, product candidates or products that we otherwise would develop or seek to commercialize ourselves.

Even if we decide we want to collaborate with other pharmaceutical and biotechnology companies for the development and potential commercialization of such product candidates, we may not be able to enter into agreements on acceptable terms, if at all. We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon the potential collaborator's evaluation of the subject product candidate and its market opportunity, our assessment of the collaborator's resources and expertise and the terms and conditions of the potential collaboration.

We are also restricted under our existing Amended Collaboration Agreement with Merck, and may be restricted under future collaboration agreements, from entering into additional agreements on certain terms with potential collaborators. For example, under the current terms of the Amended Collaboration Agreement, we may not directly or indirectly research, develop, manufacture or commercialize, except pursuant to the Amended Collaboration Agreement, any medicine or product candidate that modulates a target then subject to the collaboration with specified activity, including, if Merck exercises its option to license a 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 program for so long as Merck's license to that program remains in effect. The human hormone fibroblast growth factor 19, or FGF19 program, including aldafermin, is excluded from this provision, notwithstanding that both aldafermin and MK-3655 signal, in part, through the fibroblast growth factor receptor 1c, or FGFR1c, pathway. In addition, under the Amended Collaboration Agreement, we are prohibited from, directly or indirectly, researching, developing or commercializing any product for the treatment of heart failure with preserved ejection fraction, or HFpEF, during the research phase for the CVM-related programs.

We may not be able to raise adequate additional capital or 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 our research, the development of any product candidate for which we are seeking a collaboration or one or more of our other development programs, delay a product candidate's 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, or we may be prevented from pursuing research, 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, 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.

Risks Related to Our Dependence on Third Parties

We depend on our collaboration with Merck for the development and commercialization of our product candidates within the scope of the collaboration. Our collaboration with Merck involves numerous risks, any of which could materially and adversely affect our business and financial condition.

As described in more detail under "Business - Overview of Our Business – Our Collaboration with Merck" in Part I, Item 1 of this Annual Report on Form 10-K, our continuing Merck collaboration involves a complex allocation of rights, provides for certain R&D funding and, for products for which Merck exercises its license option, if any, 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 share 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. Under the Amended Collaboration Agreement, the research phase of the collaboration continues generally through March 2024, with possible extensions for each of the various programs to allow us or Merck to complete ongoing development during designated tail periods. The level of R&D funding we expect to receive from Merck going

forward will be substantially lower on an annual and overall basis than the R&D funding previously provided by Merck. In addition, we do not know whether Merck will exercise its option to license additional product candidates or whether Merck will terminate its license to a licensed program under the terms of the Amended Collaboration Agreement or otherwise.

Under the Amended 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 R&D funding for programs within the scope of the collaboration if we are acquired by a third party or in the event of an uncured material breach by us. Subject to certain limitations, Merck may partially terminate the Amended Collaboration Agreement for convenience as it relates to MK-3655 or any future licensed program, as it did in 2019 when it terminated its license to our growth differentiation factor 15, or GDF15, agonist program, which included currently suspended product candidates NGM395 and NGM386. Merck may also unilaterally terminate the Amended Collaboration Agreement as it relates to its rights to research and develop small molecule compounds. It may also unilaterally terminate the Amended Collaboration 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 a global cost and profit share arrangement 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 Amended Collaboration Agreement, it could delay or preclude our ability to complete certain of our research and development programs, which would materially and adversely affect our business and our stock price would likely decline. In addition, in the event that Merck decides to take over any product candidates included in the scope of the collaboration for development during any tail period, or exercises it license option for any such product candidate, we could be subject to disputes with Merck with respect to their obligation to use commercially reasonable efforts with respect to the development and commercialization 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 Amended Collaboration Agreement, any of which could delay or preclude the development or commercialization of the affected product candidate and involve us in costly and time-consuming arbitration and litigation, which could divert management attention and resources and otherwise negatively affect our business and operations.

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

We may seek other third-party collaborators for the development and commercialization of any product candidates that are not within the scope of the collaboration with Merck or if Merck elects not to proceed with development of any product candidates that are within the scope of the current collaboration. If we decide to enter into any such arrangements with any third parties, and are successful in doing so, 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 any such arrangement will depend on the specific financial terms we reach with any collaborator, as well as each of our collaborators' abilities to successfully perform the functions assigned to them in such arrangement towards developing, seeking regulatory approval for and commercializing our product candidates.

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 terms of the collaboration with Merck, if Merck exercises its option to acquire an exclusive license for a product candidate that is within the scope of the collaboration, 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 share arrangement. Even after we exercise that right to participate in a cost and profit share 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, in June 2021, we and Merck entered into the Amended Collaboration Agreement that covers a narrower scope, focused primarily on ophthalmology- and CVM-related therapeutic areas, than had been covered under the Original Collaboration Agreement. In

addition, under the terms of the Amended 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 share option) upon prior written notice, such as it did for NGM386 and NGM395, without triggering a termination of the remainder of the Amended Collaboration Agreement. Moreover, Merck might also opt not to designate any collaboration 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.

- Collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, request the suspension or termination of a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing.
- Collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours.
- 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 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.

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 and any potential future collaborators, we expect to depend on other third parties, including contract research organizations, or CROs, clinical data management organizations, clinical investigators, contract manufacturing organizations/contract development and manufacturing organizations, or CMOs, and other third-party partners and service providers 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, manufacturing or commercialization of our product candidates or any future products, which could harm our results of operations. For more information, see the risk factors titled *"We rely completely on CMOs for the manufacture of our product candidates, and 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"* and *"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 cannot guarantee that we or, as applicable, any of our collaborators will be able to successfully negotiate agreements for, and maintain relationships with, third-party partners and service providers on favorable terms, if at all. If we or any of our collaborators are unable to obtain and 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 any of our collaborators need to enter into alternative arrangements, it would delay our product development and, if applicable, commercialization 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 R&D activities reduces our control over these activities but does not relieve us of our responsibilities. For example, we 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 collaborators will devote to our R&D 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 or other R&D activities in accordance with regulatory requirements, 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 any approved products. 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 third-party partners and service providers 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 R&D, 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 and time-consuming arbitration or 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 rely completely on CMOs for the manufacture of our product candidates, and 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 require the services of third-party CMOs to provide additional process development and 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. As a result, we rely completely on CMOs, which 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 availability of drug product to use in our clinical trials and for regulatory compliance and quality assurance with respect to such drug product, 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.

Our product candidates are biologics, and 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. As a result, the manufacture of our product candidates is subject to many risks, including the following, some of which we have experienced:

- product loss or other negative consequences due to contamination, equipment failure, improper installation or operation of equipment, vendor or operator error, shortages of qualified personnel or improper delivery or storage conditions;
- difficulties with production costs and yields, quality control, product stability and quality assurance testing, including challenges related to bioanalytical method development and the qualification and implementation of those methods for release testing, which can delay availability of clinical trial materials;
- the negative consequences of failure to comply with strictly enforced federal, state and foreign regulations;

- minor deviations from normal manufacturing processes, which have in the past and may in the future result in reduced production yields, product defects and other supply disruptions;
- the presence of microbial, viral or other contaminants discovered in our product candidates or in the manufacturing facilities in which they are made, which can necessitate closure of facilities for an extended period of time to investigate and eliminate the contamination;
- the negative consequences of our CMOs' failure to qualify upon an audit by regulatory authorities, by us or by our collaborators;
- our CMOs' changing strategies and business priorities, which can affect the availability of facilities where we intended to manufacture our product candidates; and
- our CMOs' manufacturing facilities being adversely affected by labor, raw material and component shortages, turnover of qualified staff or financial difficulties of their owners or operators, including as a result of the evolving effects of the COVID-19 pandemic, or by natural disasters, power failures, local political unrest or other factors.

We cannot ensure that issues relating to the manufacture or testing of our product candidates, such as those described above, will not occur or continue to occur in the future and if we or our CMOs experience any such issues there could be a shortage of drug substance or drug product for use in our clinical trials, which could delay clinical and regulatory timelines significantly and have an adverse effect on our business.

In addition, to date our product candidates have been manufactured by CMOs solely for preclinical studies and relatively small clinical trials. We intend to continue to use CMOs for these purposes, and also for the supply of larger quantities that may be required to conduct accelerated or expanded early clinical trials or larger, later clinical trials and for commercialization if we advance any of our product candidates through regulatory approval and to commercialization. For MK-3655 and any other product candidates licensed by Merck, we will rely on Merck's internal manufacturing capacity or a third-party manufacturer engaged by Merck. These manufacturers may not have sufficient manufacturing capacity and may not be able to scale up the production of drug substance or drug product in the quantities we need and at the level of quality required in a timely or effective manner, or at all. In particular, there is increased competition in the biotechnology industry for CMO manufacturing slots and other capabilities generally, which has had, and may continue to have, a negative impact on the availability of manufacturing capacity and therefore our ability to supply clinical trial materials for planned, ongoing or expanded clinical trials.

The transfer of our small-scale manufacturing processes to CMOs for scale up and validation, such as our ongoing activities with a CMO to transfer the process for the manufacture of NGM621 in anticipation of a potential Phase 3 trial, and any later scale up and validation of the manufacturing process in the CMOs' facilities to manufacture larger quantities, involve difficult and complex processes. We may not be successful in transferring our production system to a CMO, either because it is unable to implement the process successfully in its facilities or for other reasons. Later scale-up activities are also difficult and costly and entail risks such as process reproducibility, stability, consistency and other technical challenges. If we are unable to adequately validate or scale up the manufacturing processes for our product candidates, we would need to undertake a transfer to another third party and repeat the manufacturing validation process, which can be expensive and time-consuming and could delay the initiation or completion of our clinical trials.

Similarly, we or our CMOs may make changes to our product candidates' manufacturing processes at various points in product development for many reasons, including scaling up, facility fit, raw material or component availability, decreasing costs or timing of production, improving processing robustness and reliability, decreasing processing times or others. Such changes require further validation and may have unintended consequences, which could include causing our product candidates to perform differently when administered in clinical trials and affecting clinical trial results. In some circumstances, we may be required to perform comparability or other studies to demonstrate that the product used in earlier clinical trials or at earlier stages of a trial are comparable to the product we intend to use in later trials or later stages of an ongoing trial. These efforts are expensive and there is no assurance that they will be successful, which could impact our ability to continue or initiate clinical trials in a timely manner, or at all.

Any future adverse developments affecting manufacturing operations or the scale up or validation of manufacturing processes for our product candidates may result in shipment delays, lot failures, clinical trial delays or discontinuations, or, if we are commercializing products, inventory shortages, product withdrawals or recalls or other interruptions in supply. We may also have to record inventory write-offs and incur other charges and expenses for drug substance or drug product that fails to meet specifications or cannot be used before its expiration date. In

addition, for out of specification materials, we may need to undertake costly remediation efforts or manufacture new batches at considerable cost and time delays or, in the longer run, seek more expensive manufacturing alternatives.

We also have a single source of supply for most of our product candidates, including the drug substances used in manufacturing them. Single sourcing minimizes our leverage with our CMOs, who may take advantage of our reliance on them to increase the pricing of their manufacturing services or require us to change our intended manufacturing plans based on their strategies and priorities. Single sourcing also imposes a risk of interruption or delays in supply in the event of manufacturing, quality or compliance difficulties and/or other difficulties in timely supplying us with materials. For example, our planned individual new drug application submissions for NGM438 and NGM831 were delayed due to challenges at one of our CMOs, primarily related to analytical method qualification and release testing for those product candidates. It is possible that we could experience further supply-related delays that would adversely affect our ability to commence first-in-human testing of product candidates on our anticipated timing. Moreover, we do not currently have arrangements in place for redundant supply for drug substance or drug product. If one of our suppliers fails or refuses to supply us for any reason or we otherwise choose to engage a new supplier for one or more of our product candidates, including a second source supplier to mitigate the risks of single-source supply, it would take a significant amount of time and cost to implement and execute the necessary technology transfer to, and qualification of, a new supplier. The FDA or comparable foreign health 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 health 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.

Our product candidates use certain raw materials for their production, such as reagents that support cell growth, purification materials and testing and manufacturing supplies. 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 may require the use of syringe or other components, some of 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. If our CMOs are required to obtain an alternative source of certain raw materials and components, additional testing, validation activities and regulatory approvals may be required, which may negatively impact manufacturing and other development timelines. For example, one of our CMOs recently experienced shortages of the specific cell culture media used to manufacture one of our products due to global supply chain challenges and, while we have been successful in obtaining a replacement product, these types of substitutions may require additional and unplanned testing, qualification or validation activities. Any significant delay in the acquisition or decrease in the availability of these materials, components or other items, or failure to successfully qualify or validate alternative materials or components, could considerably delay the manufacture of our product candidates, 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.

In addition, our CMOs' facilities and operations have been adversely affected by labor, raw material and component shortages, high turnover of staff and difficulties in hiring trained and qualified replacement staff and the operations of our CMOs 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. For a discussion of how the COVID-19 pandemic has affected or may affect drug or related component supplies for our clinical trials, refer to the risk factor titled *"The COVID-19 pandemic continues to adversely impact our business and operations, as well as the businesses or operations of our manufacturers, CROs or other third parties with whom we conduct business. Our business could be materially and adversely affected in the future by the effects of other disease outbreaks, epidemics and pandemics, including by the evolving effects of the COVID-19 pandemic."* Changes in economic conditions, supply chain constraints, labor, raw material and component shortages and steps taken by governments and central banks, particularly in response to the COVID-19 pandemic as well as other stimulus and spending programs, could also lead to higher inflation than previously experienced or expected, which could, in turn, lead to an increase in costs.

Our product candidates other than aldafermin and MK-3655 are currently manufactured at a facility in Lithuania. At the end of 2021 and into 2022, tensions between Russia and the United States and its allies escalated when Russia amassed large numbers of military ground forces and support personnel on the Ukraine-Russia border and, in February 2022, Russia invaded Ukraine. While the situation is evolving and fluid at the time of filing of this Annual Report on Form 10-K, the response from the United States and its allies has included both economic sanctions and NATO's deployment of additional military forces to Eastern Europe, including to Lithuania. The invasion of Ukraine and the retaliatory measures taken or that may be taken by the United States, NATO and others create global security concerns, including the possibility of expanded regional or global conflict, and are likely to have short-term and likely longer-term negative impacts on regional and global economies, any or all of which could

disrupt our supply chain and adversely affect our ability to conduct ongoing and future clinical trials of our product candidates and our ability to raise capital on favorable terms.

Any further delays or interruptions in the supply of clinical trial material could delay the completion or initiation of our 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, terminate ongoing clinical trials or abandon planned clinical trials or expansions or accelerations of clinical trials completely.

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 or for which Merck decides not to exercise its license option, 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.

Risks Related to Our Business and Industry

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

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. After reopening our offices to a fully hybrid work model in October 2021, with the increased rate of transmission experienced with the Omicron SARS-CoV-2 variant in early 2022, we returned to a more restrictive model, temporarily discouraging in-person meetings and presence on site unless necessary to perform one’s job responsibilities. Although we have re-opened our facilities under 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 the beginning of the COVID-19 pandemic, the labor market has tightened significantly and we have experienced employee attrition at rates higher than we have experienced historically, together with an increased rate of hiring new employees. We cannot predict whether these trends will continue or be exacerbated, the impact of COVID-19 on future productivity

or whether or when we may be required to return to a more restrictive work model as the COVID-19 pandemic continues to evolve. Future 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 COVID-19 pandemic continues to evolve, there may be additional negative impacts in the future on our ability to initiate new clinical trial sites, to enroll new patients and to maintain existing patients who are participating in our clinical trials, which may include increased clinical trial costs, longer timelines and delay in our ability to obtain regulatory approvals of our product candidates, if at all. 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, during the COVID-19 pandemic, we have experienced, from time to time, a slower pace of clinical site initiation and clinical trial enrollment than originally anticipated in certain of our clinical trials, and we experienced a higher subject dropout rate in our aldafermin ALPINE 2/3 trial than we had anticipated based on our previous trials in patients with NASH. We believe this may be due to factors such as the vulnerability of our studied patient populations, site staff shortages, clinical trial site suspensions, reallocation of medical resources and the challenges of working remotely due to shelter-in-place and similar government orders and guidelines, 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 trial participants from exposure to COVID-19 as a result of their trial participation, which include the use of telemedicine visits with trial participants, remote monitoring of clinical trial sites and other measures, as appropriate, designed to ensure that data from our clinical trials that may be temporarily disrupted as a result of safety measures during the COVID-19 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 sites' institutional review boards, or IRBs, or ethics committees. 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. If any of the foregoing efforts to mitigate the impact of the COVID-19 pandemic on our clinical trials 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 health 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 and guidelines 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. Our CMOs' facilities and operations have been adversely affected by labor, raw material and component shortages, high turnover of staff and difficulties in hiring trained and qualified replacement staff. These difficulties have resulted in some delays in early development timelines and we could experience more significant disruptions to our supply chain and operations as a result of the evolving effects of the continuing COVID-19 pandemic. If our CMOs are required to obtain an alternative source of certain raw materials and components, for example, additional testing, validation activities and regulatory approvals may be required which can also have a negative impact on timelines. Any associated delays in the manufacturing and supply of drug substance and drug product for our clinical trials could adversely affect our ability to conduct ongoing and future clinical trials of our product candidates on our anticipated development timelines. 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. 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 or raw materials or components in a way that delays or interrupts our supply of clinical trial material. For example, early in the pandemic, our aldafermin drug product CMO 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 or raw materials or components suppliers become subject to acts or orders of U.S. or foreign government entities to allocate or prioritize manufacturing capacity, raw materials or components to the manufacture or distribution of COVID-19 vaccines or medical supplies needed to treat COVID-19 patients, this could delay our clinical trials, perhaps substantially, which could materially and adversely affect our business.

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 is difficult to assess or predict, the COVID-19 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, economic 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 Amended Collaboration Agreement.

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 continued spread of the Delta variant in the United States and other countries, the emergence and spread of the Omicron SARS-CoV-2 variant in the United States and other countries and the potential emergence of additional SARS-CoV-2 variants that may prove especially contagious or virulent, the ultimate duration and severity of the COVID-19 pandemic, government actions, such as travel restrictions, quarantines and social distancing requirements in the United States and in other countries, business closures or business disruptions, and the effectiveness of vaccination programs and other 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.

Our product candidates must undergo rigorous clinical trials before seeking regulatory approvals, and clinical trials may be delayed, suspended or terminated at any time for many reasons, any of which could delay or prevent regulatory approval and, if approval is granted, commercialization of our product candidates.

All of our product candidates are subject to rigorous and extensive clinical trials before we can seek regulatory approval from the FDA and comparable foreign health authorities such as the European Commission. Clinical trials may be delayed, suspended or terminated at any time for reasons including but not limited to:

- ongoing discussions with the FDA or comparable foreign health authorities regarding the scope or design of our clinical trials;
- delays in obtaining, or the inability to obtain, required approvals from IRBs and ethics committees or other governing entities at clinical trial sites selected for participation in our clinical trials;
- delays in patient enrollment and other key trial activities, including as a result of the evolving effects of the COVID-19 pandemic and of the significant competition for recruiting patients with cancer in clinical trials;
- delays in reaching agreement on acceptable terms with prospective CROs and the failure of CROs, testing laboratories and other third parties to satisfy their contractual duties to us or meet expected deadlines;
- 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;

- failure of enrolled patients to complete treatment or to return for post-treatment follow-up;
- 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 health 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 health 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;
- lack of adequate funding to continue the clinical trials;
- our ability to hire and retain key research and development personnel; or
- the placement of a clinical hold on a trial by the FDA or comparable foreign health authorities.

For example, in the third quarter of 2021, the manufacturer of Abraxane® (paclitaxel protein bound), or Abraxane, reported a shortage of Abraxane to the FDA due to manufacturing delays. Abraxane, also referred to as Nab-paclitaxel, is required for treatment of patients in our ongoing Phase 1/2 NGM120 PINNACLES clinical trial. The Phase 2 portion of our PINNACLES clinical trial is studying NGM120 in combination with gemcitabine and Nab-paclitaxel as first-line treatment in patients with metastatic pancreatic cancer to assess NGM120's effect on both cancer and cancer-related cachexia. It is possible that if our clinical trial sites are unable to obtain Nab-paclitaxel in a timely fashion, or at all, that enrollment in the PINNACLES trial could substantially be delayed or precluded altogether.

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 in a timely fashion, if at all. 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. In addition, we 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 produce positive results or to demonstrate safety and efficacy to the satisfaction of the FDA or comparable health 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 early stages of development, with our most advanced product candidates only in Phase 2 development. Before obtaining marketing approval from health 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. 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.

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. For example, our Phase 2b ALPINE 2/3 trial evaluating aldafermin in patients with NASH and F2 or F3 liver fibrosis did not meet its primary endpoint and, as a result, we decided to suspend further development of aldafermin in patients with F2/F3 NASH, allowing for the reallocation of resources to advancing our other programs. While we continued, and have completed, enrollment in our Phase 2b ALPINE 4 clinical trial of aldafermin in patients with compensated NASH cirrhosis (F4 liver fibrosis), we recently updated the design of the ALPINE 4 trial, elevating the Enhanced Liver Fibrosis, or ELF, test, a reproducible, quantitative non-invasive liver prognostic test that evaluates liver fibrosis and correlates to liver-related outcomes, to be the primary endpoint for the trial. The ELF test is a composite blood test measuring the presence of three biomarkers associated with liver matrix metabolism. Liver biopsy data will also be measured and reported as a secondary endpoint upon completion of the trial. For more information, see the risk factor titled "*Aldafermin, which is wholly-owned by us, as well as 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 may determine to discontinue any further development of aldafermin in the future, in which case, we will not receive any return on our investment in aldafermin.

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 comparable foreign health 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.

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

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. Owing in part to the complexity of biological pathways, when used to treat human patients, our product candidates might not demonstrate 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. 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 three of our oncology product candidates, NGM707, NGM831 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, in spite of the results we had obtained in our Phase 1 trials of aldafermin and in our first Phase 2 trial, in May 2021, we announced that our Phase 2b ALPINE 2/3 trial evaluating aldafermin in patients with NASH and F2 or F3 liver fibrosis did not meet its primary endpoint.

In addition, some of our earlier-stage 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.

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 health 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 health authorities. Additional clinical trials may be required to further evaluate the safety profile of our product candidates. Patients in certain of our ongoing or planned clinical trials, particularly patients with cancer or with NASH with more advanced fibrosis, often 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, in cancer patients, 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.

Patients have experienced, and we have reported, serious adverse events, or SAEs, in the treatment arms of our completed trials of MK-3655, NGM621 and aldafermin. Ocular SAEs reported in our ongoing Phase 2 CATALINA trial of NGM621, which remains masked to treatment assignment, include retinal detachment in the non-study eye, development of choroidal neovascularization in the study eye, visual worsening due to arterial occlusive disease in the study eye and decreases of vision, or visual acuity loss, due to worsening geographic atrophy, or GA, in the study and non-study eye. We expect that patients in our clinical trials, including those that are sham- or placebo-controlled with some patients not receiving study drug, 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. For example, cancer patients enrolled in our ongoing clinical trials of NGM120 and NGM707, many of whom are suffering from advanced life-threatening illness, have experienced, and we expect will continue to experience, SAEs and other adverse events, which may or may not be drug related. 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 cholesterol, or LDL-C, were observed in clinical trials of aldafermin in patients with NASH and type 2 diabetes. Serum levels of LDL-C were brought back to baseline levels with concomitant statin use in patients with NASH; however, the impact of these drug-induced changes in LDL-C are unknown. Generally, sustained and prolonged LDL-C elevations in untreated patients are associated with cardiovascular disease through atherosclerotic plaque development. While data from our completed Phase 2b ALPINE 2/3 clinical trial and earlier trials of aldafermin demonstrated the ability of concomitant statin use to mitigate the serum LDL-C elevations driven by aldafermin activity, aldafermin's impact on LDL-C may negatively impact market acceptance of an approved aldafermin product.

Our product candidates 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 developed an assay to measure the presence of ADAs against aldafermin for our ongoing NASH program, which we are using to test patient samples and which will need to be 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 intravitreal, or IVT, injections, including investigators in the Phase 2 CATALINA trial, 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 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.

Aldafermin, which is wholly-owned by us, as well as 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 Merck 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 health 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 health authorities. Such evolution may impact our future clinical trial designs, including trial size and endpoints, in ways that we cannot currently predict. We recently updated the design of the ALPINE 4 trial of aldafermin, elevating the ELF test to be the primary endpoint for the trial. Neither the ELF test, nor any other surrogate biomarker endpoints, are currently endorsed by the FDA or EMA as sufficient for granting regulatory approval of products being developed for the treatment of F4 (cirrhotic) NASH and therefore may not be able to be used as a primary endpoint in potential future Phase 3 trials to support regulatory approval for aldafermin for F4 NASH.

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.

Aldafermin is a modified version of a human hormone that has been associated with liver cancer in rodent testing.

The IND application we filed for aldafermin 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. Concerns about the association between FGF19 and liver cancer could have an adverse effect on our ability to develop and commercialize aldafermin.

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

The success of our business over the longer term depends upon our ability to identify and validate new potential 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 to be developed as product candidates. In addition, our drug discovery efforts often 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 additional new product candidates to advance into clinical trials could have a material adverse effect on 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 R&D, 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 development activities related to multiple metabolic disease product candidates and for aldafermin in patients with F2 or F3 NASH to concentrate our resources elsewhere, also may be incorrect and could cause us to miss valuable opportunities.

Under the terms of our Amended 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 biologics license application, or 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 share 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 our Chief Scientific Officer, Dr. Jin-Long Chen, or to 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 R&D and other 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.

There is intense competition for qualified personnel, including management, in the technical fields in which we operate, particularly in the oncology field, 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. The labor market has tightened significantly since the beginning of the ongoing COVID-19 pandemic, and we have experienced employee attrition at rates higher than we experienced historically, which may continue and could have a negative impact on our productivity. 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 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, particularly in the oncology field. It is probable that the number of companies seeking to develop products and therapies for the treatment of cancer, retinal diseases and liver and metabolic diseases 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 and approval or marketing authorization from comparable health authorities such as the European Commission 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- or EMA-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 or GA) 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” above.

In addition, in the third quarter of 2021, Apellis Pharmaceuticals, Inc., or Apellis, presented top-line results from two Phase 3 clinical trials of its product candidate, pegcetacoplan (an anti-complement C3), in patients with GA secondary to age-related macular degeneration. One trial met the primary endpoint of significantly reducing GA progression at a one-year time point in the pegcetacoplan arm versus the sham arm, while the other trial did not meet its primary endpoint. Apellis reported that it plans to submit a new drug application for pegcetacoplan for GA to the FDA in the first half of 2022. If Apellis obtains regulatory approval of pegcetacoplan, it may affect our future late-stage clinical trial designs and require added clinical development expense. Additionally, if we obtain regulatory approval of NGM621, we may not be able to compete effectively against pegcetacoplan, which may adversely affect our future revenues and business prospects.

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

Over the past few years, 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, hybrid and remote work policies, reporting systems and operational, financial and management controls, particularly in light of the evolving effects of the COVID-19 pandemic. We also may not be able to expand or identify and access sufficient facilities to accommodate our growth, particularly given our location in South San Francisco, California and the current high demand for, and restricted supply of, R&D facilities in this market. The current lease for our facilities in South San Francisco is scheduled to expire in December 2023. While we believe we will be able to extend our lease or obtain new and/or additional space, as needed, on commercially reasonable terms, based on current market conditions our lease obligations will likely be higher in the future. 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.

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

Demonstrating the safety and efficacy of our product candidates and obtaining regulatory approvals will not guarantee future revenue. 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. 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 physicians and patients;
- the actual and perceived advantages of the product candidate over alternative treatments, including any similar generic treatments;
- the viewpoints of influential physicians with respect to the product candidate;
- the inclusion or exclusion of the product candidate from treatment guidelines established by various physician groups;
- the cost of treatment relative to alternative treatments;
- our pricing and the availability of coverage and adequate reimbursement by third parties and government authorities as described in the risk factor titled “*Even if we obtain approval to market our products, these products may become subject to unfavorable pricing regulations, reimbursement practices from third-party payors or healthcare reform initiatives in the United States and abroad, which could harm our business*”;
- 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, if any. 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."* 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 obtain approval to market our products, these products may become subject to unfavorable pricing regulations, reimbursement practices from third-party payors or healthcare reform initiatives in the United States and abroad, 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 the EU, Japan and Canada, the pricing of prescription drugs is controlled by the government and 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 regulatory approval for the product 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. 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. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. 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 drugs. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for drug 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 collaborators obtain regulatory approval. If coverage and reimbursement are not available or reimbursement is available only to limited levels, we and our collaborators 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 health 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.

For example, 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. While Congress has not passed comprehensive legislation repealing the ACA, such legislation may be reintroduced. Members of Congress have introduced legislation to modify or replace certain provisions of the ACA. It is unclear how these efforts to repeal and/or replace the ACA will impact the ACA and our business. For example, the Tax Cuts and JOBS Act, or 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. On June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the “individual mandate” was repealed by Congress. Thus, the ACA remains in effect in its current form, although it may be subject to judicial or Congressional challenges in the future. Any such challenges to the ACA and the healthcare reform measures of the administration of President Biden may increase the pressure on drug pricing or limit the availability of coverage and adequate reimbursement for our product candidates, which would adversely affect our business.

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. For example, in an executive order, the administration of President Biden expressed its intent to pursue certain policy initiatives to reduce drug prices and, in response, the United States Department of Health and Human Services, or HHS, released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue to lower drug prices. 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. 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.

In many countries outside the United States, government-sponsored healthcare systems are the primary payors for drugs. With increasing budgetary constraints and/or difficulty in understanding the value of medicines, governments and payors in many countries are applying a variety of measures to exert downward price pressure. These measures include: mandatory price controls; price referencing; therapeutic-reference pricing; increases in mandates; incentives for generic substitution and biosimilar usage and government-mandated price cuts. Many countries have health technology assessment agencies that use formal economic metrics such as cost-effectiveness to determine prices, coverage and reimbursement of new therapies. These agencies are expanding in both established and emerging markets and are expected to become law in EU member states in the near future with the adoption of the Health Technology Assessment Regulation. Many countries also limit coverage to populations narrower than those specified on product labels or impose volume caps to limit utilization. We expect that countries will continue taking aggressive actions to seek to reduce expenditures on drugs. Similarly, fiscal constraints may also affect the extent to which countries are willing to approve new and innovative therapies and/or allow access to new technologies.

We cannot predict the likelihood, nature or extent of healthcare reform initiatives that may arise from future legislation or administrative action. 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 and data protection 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 or component 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 obtain 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, or HITECH, 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, processing and transmission of individually identifiable health information;

- the federal Physician Payments Sunshine Act, as amended, 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 HHS information related to "payments or other transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other health care professionals (such as physician assistants and nurse practitioners) and teaching hospitals, as well as information regarding ownership and investment interests held by physicians and their immediate family members; 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 and other processing 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, litigation, 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.

Outside the United States, interactions between pharmaceutical companies and health care professionals are also governed by strict laws, such as national anti-bribery laws of EU member states, national sunshine rules, regulations, industry self-regulation codes of conduct and physicians' codes of professional conduct. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

Risks Related to Regulatory Approvals

The regulatory approval processes of the FDA and comparable foreign health authorities are lengthy 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 health 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 health 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 health 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;
- unfavorable quality review or audit findings; or
- changes in the approval policies or regulations that render our preclinical and clinical data insufficient for approval.

The FDA or a comparable foreign health 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 accelerated approval based on a surrogate endpoint and contingent on the successful outcome of costly post-marketing confirmatory 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.

In some jurisdictions such as the United States and the EU, initiating phase 3 clinical trials and clinical trials in the pediatric population is subject to a requirement to obtain approval or a waiver from the FDA, the competent authorities of the EU member states and/or the EMA. If we do not obtain such waivers or approval, our ability to conduct clinical trials and obtain marketing authorizations or approvals may be severely impaired, and our business may be adversely impacted.

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, full product approval. Accordingly, although NGM621 has received Fast Track designation from the FDA for GA secondary to age-related macular degeneration and 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 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. In addition, if full approval is granted for another product in the same indication for which we are seeking accelerated approval for one of our product candidates, the accelerated approval pathway may no longer be available to us for our product candidate.

In the EU, innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the Priority Medicines, or PRIME, scheme, which provides incentives similar to the breakthrough therapy designation in the United States. PRIME is a voluntary scheme aimed at enhancing the EMA's support for the development of medicinal products that target unmet medical needs. It permits increased interaction and early dialogue between regulatory authorities and companies developing promising medicinal products, to optimize their product development plans and speed up their evaluation to help the product potentially reach patients sooner than under the normal review timelines. Product developers that benefit from PRIME designation are potentially eligible for accelerated assessment of their marketing authorization applications, or MAA, although this is not guaranteed. 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 potentially accelerated MAA assessment once a dossier has been submitted.

Our failure to obtain health authority 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 pricing and reimbursement approvals before health 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 health 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 health 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 health 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 health authorities will continue to closely monitor the safety profile of any product even after approval. If the FDA or comparable foreign health 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 REMS, 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. Failure to comply with any related obligations may result in the suspension or withdrawal of an obtained approval and in civil and/or criminal penalties. Receipt of approval for narrower indications than sought, restrictions on marketing through a REMS or similar strategy imposed in an EU member state or other foreign country, or significant labeling restrictions or requirements in an approved label such as a boxed warning, could have a negative impact on our ability to recoup our research and development costs and to successfully commercialize that product, any of which could materially and adversely affect our business, financial condition, results of operations and growth prospects. In any event, if we are unable to comply with our post-marketing obligations imposed as part of the marketing approvals in the United States, the EU, or other countries, our approval may be varied, suspended or revoked, product supply may be delayed and our sales of our products could be materially adversely affected.

In addition, manufacturers of drug substance and drug products and their facilities are subject to continual review and periodic inspections by the FDA and comparable foreign health authorities for compliance with current Good Manufacturing Practices, or 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 health authorities, public prosecutors, industry associations, healthcare professionals and other members of the public will heavily scrutinize advertising and promotion of any product candidate 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.

Failure to comply with EU and EU member state laws that apply to the conduct of clinical trials, manufacturing approval, marketing authorization of medicinal products and marketing of such products, both before and after grant of a marketing authorization, or with other applicable regulatory requirements, may result in administrative, civil or criminal penalties. These penalties could include delays or refusal to authorize the conduct of clinical trials, or to grant marketing authorization, product withdrawals and recalls, product seizures, suspension, withdrawal or variation of the marketing authorization, total or partial suspension of production, distribution, manufacturing or clinical trials, operating restrictions, injunctions, suspension of licenses, fines and criminal penalties.

Many EU member states periodically review their reimbursement of medicinal products, which could have an adverse impact on reimbursement status. In addition, we expect that legislators, policymakers and healthcare insurance funds in the EU member states will continue to propose and implement cost-containing measures, such as lower maximum prices, lower or lack of reimbursement coverage and incentives to use cheaper, usually generic, products as an alternative to branded products, and/or branded products available through parallel import to keep healthcare costs down. Moreover, in order to obtain reimbursement for our products in some EU member states, we may be required to compile additional data comparing the cost-effectiveness of our products to other available therapies. Health Technology Assessment, or HTA, of medicinal products is becoming an increasingly common part of the pricing and reimbursement procedures in some EU member states, including those representing the larger markets. The HTA process, which is currently governed by national laws in each EU member state, is the procedure to assess therapeutic, economic and societal impact of a given medicinal product in the national healthcare systems of the individual country. The outcome of an HTA will often influence the pricing and reimbursement status granted

to these medicinal products by the competent authorities of individual EU member states. The extent to which pricing and reimbursement decisions are influenced by the HTA of the specific medicinal product currently varies between EU member states. In June 2021, the European Parliament and Council reached a provisional agreement on a draft HTA regulation that aims to harmonize the clinical benefit assessment of HTA across the EU. Entry into application of the Regulation could impose stricter and more detailed procedures to be followed by marketing authorization holders concerning conduct of HTA in relation to their products that may influence related pricing and reimbursement decisions. If we are unable to maintain favorable pricing and reimbursement status in EU member states that represent significant markets, our anticipated revenue from and growth prospects for our products in the EU could be negatively affected.

Legislators, policymakers and healthcare insurance funds in the EU may continue to propose and implement cost-containing measures to keep healthcare costs down; particularly due to the financial strain that the COVID-19 pandemic has placed on national healthcare systems of the EU member states. These measures could include limitations on the prices we will be able to charge for our products or the level of reimbursement available for these products from governmental authorities or third-party payors. Further, an increasing number of EU and other foreign countries use prices for medicinal products established in other countries as “reference prices” to help determine the price of the product in their own territory. Consequently, a downward trend in prices of medicinal products in some countries could contribute to similar downward trends elsewhere.

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 any of our product candidates, we will have tested them in only a small number of patients during our clinical trials. If an application for marketing is approved for any of our product candidates and more patients begin to use our product, new risks and side effects associated with our products may be discovered. As a result, health 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 our 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 own one issued United States patent that covers our NGM621 product candidate, although the product and related compositions-of-matter and methods of use are disclosed and claimed in other pending U.S. non-provisional and/or national stage applications in particular foreign countries. We do not currently own or have a license to any issued patents that cover our NGM707, NGM831 and NGM438 product candidates, although these product candidates are disclosed and claimed in our pending U.S. non-provisional and international 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, that we will obtain sufficiently broad claims to be able to prevent others from selling competing products or that we will be able to protect and maintain any patent protection that we initially secure.

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 any of our 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 fields of cancer, retinal diseases, CVM-related diseases, including heart failure, and liver and metabolic diseases, 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 Discovery Ltd. and Lonza Sales AG, 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 United States Patent and Trademark Office, or 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 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 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 $32.12 on March 17, 2021 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 elsewhere in this “Risk Factors” section, these factors include:

- developments associated with our collaboration with Merck 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 or geopolitical instability, 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 elsewhere 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 titled "*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 our common stock, our stock price could fall.

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, 2021, the average daily trading volume for our common stock on The Nasdaq Global Select Market was only 305,717 shares and, during the three months ended December 31, 2020, was 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 by any of our large stockholders, or even 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 of 1933, as amended, or 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 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

We, our CROs, our CMOs, our current and potential future partners and other third parties we rely on or partner with 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. Our technology systems and the information and data processed and stored in our technology systems or otherwise by us or on our behalf, and the technology systems of, and data accessed on our behalf by, 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 may result from the actions of a wide variety of actors, including traditional hackers, our personnel or the personnel of the third parties we work with, sophisticated nation-states and nation-state-supported actors. Threats we and third parties on which we rely may face are constantly evolving and include (without limitation), malware, viruses, software vulnerabilities and bugs, software or hardware failure, hacking, denial of service attacks, social engineering (including phishing), ransomware, inside threats, credential stuffing or other cyberattacks, telecommunications failures, earthquakes, fires, floods and similar threats. Threats such as ransomware attacks, for example, are becoming increasingly prevalent and severe. Extortion payments may alleviate the negative impact of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments.

We may, under certain data privacy and security obligations, be required to, or we may choose to, expend significant resources or modify our business activities (including our clinical trial activities) in an effort to protect against security incidents. 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 implement 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 on a full- or part-time basis 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, including personal information, any of which could have a material adverse effect on our business.

Despite our efforts to strengthen security and authentication measures, we have not always been able in the past, and may be unable in the future, to detect vulnerabilities in our information technology systems. We have experienced an overall increase in cybersecurity incidents, none of which, to date, have caused material disruption to our business, or to our knowledge, involved a material security breach. Most 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 or partner with could experience a material system failure, security breach or other cybersecurity incident, including any related to or in connection with any of the aforementioned threats, 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 or partner with could also result in substantial remediation costs and expose us to litigation (including class claims),

regulatory enforcement action (for example, investigations, fines, penalties, audits and inspections), additional reporting requirements and/or oversight, fines, penalties, indemnification obligations, negative publicity, reputational harm, monetary fund diversions, interruptions in our operations (including availability of data), financial loss and other liabilities and harms. Additionally, such incidents may trigger data privacy and security obligations requiring us to notify relevant stakeholders. These disclosures are costly, and the disclosures or the failure to comply with such requirements could lead to adverse consequences.

Our contracts may not contain limitations of liability, and even where they do, there can be no assurance that limitations of liability in our contracts are sufficient to protect us from claims related to our data privacy and security obligations. Additionally, 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 and commercially 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.

The withdrawal of the United Kingdom from the EU, commonly referred to as Brexit, could increase our cost of doing business, reduce our gross margins or otherwise negatively impact our business and our financial results.

Brexit will continue to create significant uncertainty concerning the future relationship between the United Kingdom, or UK, and the EU, following the UK withdrawal from the EU in January 2020. Since a significant portion of the regulatory framework in the UK is derived from EU laws, Brexit materially impacts the regulatory regime with respect to the development, manufacture, importation, approval and commercialization of our product candidates in the UK or the EU. Among the changes that will now occur are that Great Britain (England, Scotland and Wales) will be treated as a “third country,” a country that is not a member of the EU and whose citizens do not enjoy the EU right to free movement.

In this regard, in December 2020, the EU and UK reached an agreement in principle on the framework for their future relationship, the EU-UK Trade and Cooperation Agreement, or TCA. The TCA primarily focuses on ensuring free trade between the EU and the UK in relation to goods, including medicinal products. As part of the TCA, the EU and the UK will recognize cGMP inspections carried out by the other party and the acceptance of official cGMP documents issued by the other party. The TCA also encourages, although it does not oblige, the parties to consult one another on proposals to introduce significant changes to technical regulations or inspection procedures. Among the areas of absence of mutual recognition are batch testing and batch release. The UK has unilaterally agreed to accept EU batch testing and batch release for a period of at least 2 years until January 1, 2023. However, the EU continues to apply EU laws that require batch testing and batch release to take place in the EU territory. This means that medicinal products that are tested and released in the UK must be retested and re-released when entering the EU market for commercial use. As it relates to marketing authorizations, Great Britain will have a separate regulatory submission process, approval process and national marketing authorization. Northern Ireland will, however, continue to be covered by the marketing authorizations granted by the European Commission. For example, the scope of a marketing authorization for a medicinal product granted by the European Commission or by the competent authorities of EU member states will no longer encompass Great Britain (England, Scotland and Wales). In these circumstances, a separate marketing authorization granted by the UK competent authorities will be required to place medicinal products on the market in Great Britain. Northern Ireland will, however, continue to be covered by the marketing authorizations granted by the European Commission. These changes, as well as future changes, could increase the costs and complexity of doing business in or with the UK, which could adversely affect our business.

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

We may collect, use, transfer or otherwise process proprietary, confidential and sensitive information, including personal information (including health-related data), which subjects us to numerous evolving and complex data privacy and security obligations, including various laws, regulations, guidance, industry standards, external and internal privacy and security policies, contracts and other obligations that govern the processing of such information by us and on our behalf. For example, we process personal information from clinical trials participants and other individuals located in the European Economic Area, or EEA, and, if any of our product candidates are approved, we may seek to commercialize those products in the EEA. The collection, use and other processing of personal information, including health data, in the EEA or regarding residents of the EEA are governed by the EU’s General

Data Protection Regulation ((EU) 2016/679), or EU GDPR, and other relevant laws that govern patient confidentiality and storage of personal health data. Companies that violate the EU GDPR can face private litigation, prohibitions on data processing, other administrative measures, reputational damage and fines of up to the greater of 20 million Euros or 4% of their worldwide annual revenue. The EU GDPR requires us to, among other things: 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. The UK has incorporated an amended version of the EU GDPR into UK law, commonly referred to as the UK GDPR, which is independent from, but aligned with, the EU GDPR, which together with the UK Data Protection Act of 2018, or UK DPA, covers the processing of personal data of UK residents. Non-compliance with UK data protection laws may result in monetary penalties of up to £17.5 million or 4% of worldwide revenue, whichever is higher.

The EU GDPR and accompanying laws are evolving and subject to interpretation and may impose limitations on our activities or otherwise adversely affect our business. Because of the remote work policies we implemented due to the COVID-19 pandemic, information that is normally protected, including company confidential information, may be less secure. Cybersecurity and data security threats continue to evolve and raise the risk of an incident that could affect our operations or compromise our business information or sensitive personal data, including health data. We may also need to collect more extensive health-related information from our employees to manage our workforce.

Certain jurisdictions, including the EEA, UK and Switzerland, have enacted data localization laws and laws restricting cross-border transfers of personal information. For example, the EU GDPR generally restricts the transfer of personal information from the EEA to countries outside of the EEA, such as the United States, which the European Commission does not consider is providing an adequate level of data privacy and security. One of the primary mechanisms designed to allow United States companies to continue to import personal information from the EA 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 that has not been deemed by the European Commission to provide an adequate level of data privacy and security. In addition to implementing and complying with such contractual obligations, the European Commission's most recent version of the SCCs, released on June 4, 2021, requires parties to meet additional obligations, such as conducting transfer impact assessments to determine whether additional security measures are necessary to protect the data at issue. If adequate data protection cannot be guaranteed, EEA residents may complain to the data protection authorities, which may require data transfers under the contract to be suspended. The European Commission's updated SCCs may further increase the legal risks and liabilities under European privacy, data protection and information security laws. Additionally, due to potential legal challenges, there exists some uncertainty regarding whether the SCCs will remain a valid mechanism for transfers of personal information out of the EEA. Laws in the UK and Switzerland similarly restrict transfers of personal information outside of those jurisdictions to countries such as the United States that are deemed not to provide an adequate level of personal information protection.

We continue to monitor changes in data protection laws related to the cross-border transfer of personal information; however, uncertainty remains regarding any future regulations, interpretations or guidance that may be issued, particularly by the EU authorities. At present, we primarily rely on individuals' explicit consent, which can be revoked at any time, to transfer their personal information from the EU 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 the EU, or if we are otherwise unable to implement a valid compliance solution for cross-border transfers of personal information, we will face increased exposure to substantial fines, regulatory actions, as well as injunctions against the export and processing of personal information from Europe. Our inability to import personal information from the EEA, UK or Switzerland or other countries may also restrict our clinical trial activities in those countries; limit our ability to collaborate with CROs, service providers, contractors and other companies subject to laws restricting cross-border data transfers; require us to increase our data processing capabilities in other countries at significant expense and may otherwise negatively impact our business operations.

Additionally, other countries 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 at the federal, state and local level are increasingly complex and changing rapidly. For example, at the federal level, HIPAA, as amended by HITECH, imposes specific

requirements relating to the privacy, security and transmission of individually identifiable health information. Additionally, at the state level, the privacy and data protection landscape is changing rapidly. For example, just over a month after the EU 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 EU 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, including statutory fines for noncompliance and a limited private right of action in connection with certain data breaches. 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 evolving patchwork of differing state and federal privacy and data security laws increases the cost and complexity of operating our business and increase our exposure to liability. 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, or CPRA, 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, forthcoming CPRA and similar laws, which may increase our compliance costs, exposure to regulatory enforcement action and other liabilities.

Our obligations related to data privacy and security are quickly changing in an increasingly stringent fashion. These obligations may be subject to differing applications and interpretations, which may be inconsistent or in conflict among jurisdictions. Preparing for and complying with these obligations requires us to devote significant resources (including, without limitation, financial and time-related resources). These obligations may necessitate changes to our information technologies, systems and practices and to those of any third parties that process personal information on our behalf. In addition, these obligations may require us to change aspects of our business model. Although we endeavor to comply with applicable data privacy and security obligations, we may at times fail (or be perceived to have failed) to do so. Moreover, despite our efforts, our personnel or third parties upon whom we rely may fail to comply with such obligations, which could impact whether or not we are in compliance.

If we fail, or are perceived to have failed, to address or comply with data privacy and security obligations, we could face significant consequences, including (without limitation): government enforcement actions (e.g., investigations, fines, penalties, audits, inspections and similar); litigation (including class-related claims); additional reporting requirements and/or oversight; bans on processing personal information; orders to destroy or not use personal information; and imprisonment of company officials. Any of these events could have a material adverse effect on our reputation, business or financial condition, including but not limited to: loss of customers; interruptions or stoppages in our business operations (including clinical trials); inability to process personal information or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or revision or restructuring of our operations.

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.

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 substances for NGM120, NGM621, NGM707, NGM831 and NGM438 is located in Lithuania, a region that has experienced political unrest. See "*We rely completely on CMOs for the manufacture of our product candidates and 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*." 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 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 ended 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 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 ability to deduct 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 has 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.

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, directives, decrees 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 continue to incur increased costs as a result of operating as a public company, and our management devotes substantial time to new compliance initiatives. In addition, we are obligated to develop and maintain proper and effective internal control over financial reporting. In the future, we may not complete our analysis of our internal control over financial reporting in a timely manner, or our internal control over financial reporting may not be determined to be effective, which may adversely affect investor confidence in our company and, as a result, the value of our common stock.

As a public company, we incur significant legal, accounting, insurance and other expenses, and these expenses further increased in connection with our loss of "emerging growth company" status as of December 31, 2021. As a public company, we are subject to the reporting requirements of the Securities and Exchange Act of 1934, as amended, or the Exchange Act, the Sarbanes-Oxley Act of 2002, or 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 maintaining effective internal controls and procedures. The Sarbanes-Oxley Act requires, among other things, 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. In addition, we must perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on the effectiveness of our internal control over financial reporting, as required by Section 404 of the Sarbanes-Oxley Act, and to allow our independent registered public accounting firm to issue an attestation report on the effectiveness of our internal control over financial reporting. Our compliance with Section 404 of the Sarbanes-Oxley Act requires that we incur substantial accounting expense and expend significant management efforts. We currently do not have an internal audit staff, and we have hired and will need to hire additional accounting and financial staff with appropriate public company experience and technical accounting knowledge. If we are not able to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner, or if we or our independent registered public accounting firm identify deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, 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 ability to successfully implement our business plan and comply with Section 404 of the Sarbanes-Oxley Act requires us to be able to prepare timely and accurate financial statements. We expect that we will need to continue to improve existing, and implement new operational and financial systems, procedures and controls to manage our business effectively. Any delay in the implementation of, or disruption in the transition to, new or enhanced systems, procedures or controls may cause our operations to suffer and we may be unable to conclude that our internal control over financial reporting is effective and to obtain an attestation report from our independent registered public accounting firm as required under Section 404 of the Sarbanes-Oxley Act. This, in turn, could have an adverse impact on the price for our common stock, and could adversely affect our ability to access the capital markets.

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 extend our lease or obtain new and/or additional space, as needed, on commercially reasonable terms, although based on current market conditions our lease obligations will likely be higher in the future.

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

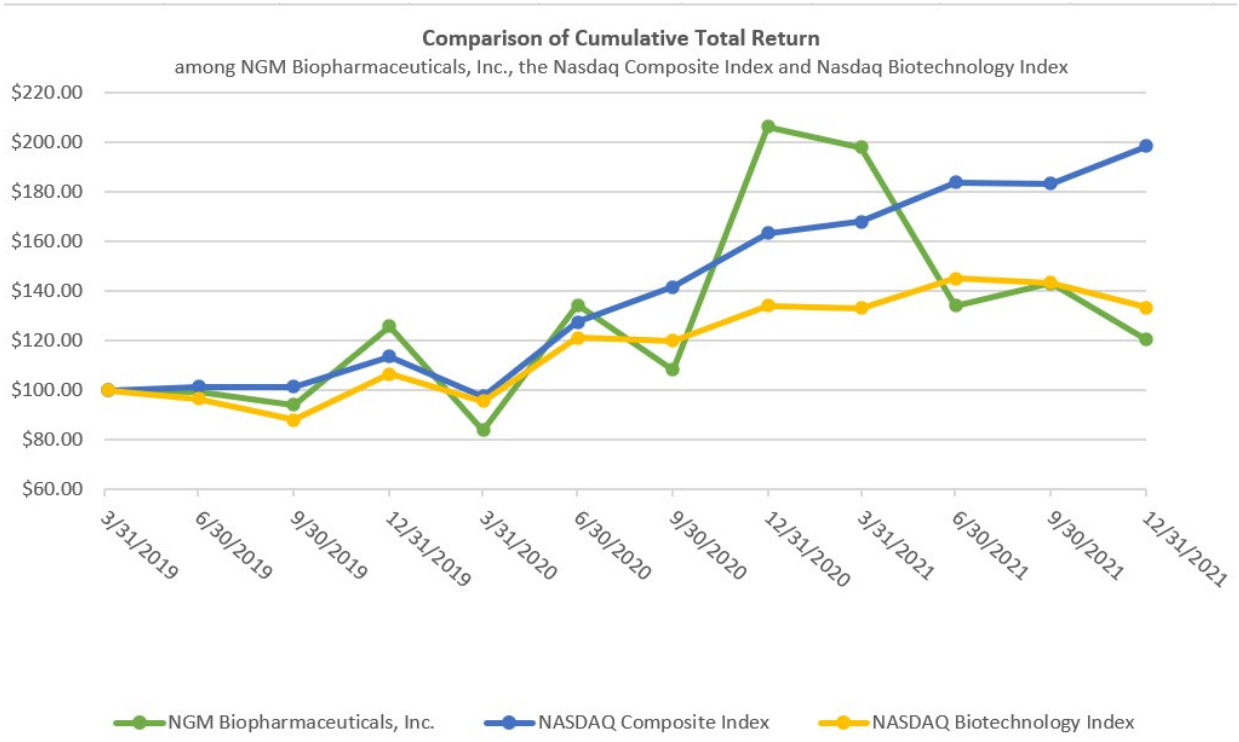
Our common stock has been listed on the Nasdaq Global Select Market under the symbol "NGM" since April 4, 2019. Prior to that date, there was no public trading market for our common stock.

Holders of Record

As of the close of business on February 23, 2022, there were 44 stockholders of record of our common stock. The actual number of stockholders is greater than the number of stockholders of record and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of stockholders 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) the Nasdaq Composite Index and (iii) the 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, 2021. 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	12/31/2020	3/31/2021	6/30/2021	9/30/2021	12/31/2021
NGM Biopharmaceuticals, Inc.	$ 100.00	$ 125.78	$ 206.09	$ 197.76	$ 134.15	$ 142.99	$ 120.48
NASDAQ Composite Index	100.00	113.70	163.31	167.86	183.79	183.08	198.24
NASDAQ Biotechnology Index	100.00	106.66	134.05	133.09	145.00	143.23	133.20

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, 2021, we did not issue or sell any unregistered securities.

Issuer Purchases of Equity Securities

During the three-month period ended December 31, 2021, we repurchased unvested shares of our common stock that had been issued upon early exercise of stock options. Upon termination of employment of a person holding unvested shares, we are entitled to repurchase the unvested shares. The following table summarizes repurchases of our common stock:

	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (2)	Maximum Number (or Approximate Dollar Value) of Shares that May Yet Be Purchased Under the Plans or Programs (2)
October 1 - October 31, 2021	157	$ 8.14		
November 1 - November 30, 2021	—	—		
December 1 - December 31, 2021	—	—		
Total	157	$ 8.14		

(1) All of the shares repurchased were repurchases of unvested shares of our common stock that had been issued upon early exercise of stock options.

(2) Not applicable. Share repurchases were not made pursuant to publicly announced plans or programs.

Item 6. [Reserved]

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 audited consolidated financial statements and related notes appearing elsewhere in this Annual Report. This discussion and analysis contains forward-looking statements based upon current beliefs, plans and expectations that involve risks, uncertainties and assumptions, such as statements regarding our plans, objectives, expectations, intentions and projections. Our actual results and the timing of events could differ materially from those anticipated in these forward-looking statements as a result of several factors that could impact our business, including those set forth in the section titled "Risk Factors" under Part I, Item 1A in this Annual Report on Form 10-K. In some cases, you can identify forward-looking statements by terminology such as "anticipate," "believe," "continue," "could," "estimate," "expect," "intend," "may," "plan," "potentially," "predict," "should," "will" or the negative of these terms or other similar expressions. See "Special Note Regarding Forward-Looking Statements" in this Annual Report on Form 10-K.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this Annual Report on Form 10-K, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate we have conducted

exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

Overview

We are a biopharmaceutical company focused on discovering and developing novel, potentially life-changing medicines based on scientific understanding of key biological pathways underlying retinal diseases, cancer and liver and metabolic diseases. 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 ranging from early discovery to Phase 2b development. Currently, we have seven disclosed programs, including four in Phase 2 or 2b studies, across three therapeutic areas: cancer, retinal diseases and liver and metabolic diseases. Our biology-centric drug discovery approach aims to seamlessly integrate interrogation of complex disease-associated biology and protein engineering expertise to unlock proprietary insights that are leveraged to generate promising product candidates and enable their rapid advancement into proof-of-concept studies. As explorers on the frontier of life-changing science, we aspire to operate one of the most productive research and development engines in the biopharmaceutical industry. All therapeutic candidates in our pipeline have been generated by our in-house therapeutic area-agnostic discovery engine, led by biology and motivated by unmet patient need.

Pipeline Programs and Operational Updates

Pipeline Programs

We currently have five product candidates in the clinic, three wholly-owned by us (NGM707, NGM120 and aldafermin), one being progressed by our collaborator, Merck Sharp & Dohme Corp., or Merck (MK-3655) and one optionable by Merck (NGM621). In addition, we have two wholly-owned product candidates expected to enter the clinic in the first half of 2022:

- **Oncology**. Our oncology product candidates NGM707, NGM831, NGM438 and NGM120 and their related compounds are wholly-owned by us.
    - **NGM707**. NGM707, the lead asset in our myeloid reprogramming and checkpoint inhibition portfolio, is a dual antagonist monoclonal antibody that is designed to improve patient immune responses to tumors by inhibiting both Immunoglobulin-like transcript 2, or ILT2 (also known as LILRB1), and Immunoglobulin-like transcript 4, or ILT4 (also known as LILRB2) receptors. 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 may also reverse inhibition of ILT2-expressing lymphoid cells to further stimulate anti-tumor immune responses.
        - In June 2021, we initiated the open-label, Phase 1 portion of a Phase 1/2 clinical trial evaluating NGM707 as a monotherapy and in combination with KEYTRUDA® (pembrolizumab) for the treatment of patients with advanced solid tumors. We expect to enroll approximately 180 patients in this trial. The ongoing Phase 1a cohort of the trial is evaluating NGM707 as a monotherapy. The Phase 1b cohort will evaluate NGM707 in combination with pembrolizumab in patients with advanced solid tumors.
        - ***Looking forward**:* We anticipate a readout of initial data from the Phase 1a cohort in the second half of 2022. The Phase 1 portion of the trial is expected to be followed by a Phase 2 dose-expansion in cohorts of specific tumor types.
    - **NGM831**. In August 2021, we disclosed NGM831, an antagonist antibody that is designed to block the interaction of the Immunoglobulin-like transcript 3, or ILT3 (also known as LILRB4) receptor, with fibronectin, as well as other cognate ligands. For tumors in which both ILT3 and fibronectin are upregulated, the ILT3-fibronectin signaling pathway may act as a stromal checkpoint to repress myeloid cell function and inhibit anti-tumor immunity. By inhibiting ILT3's interaction with fibronectin and its other ligands, we believe NGM831 has the potential to mobilize a patient's own immune system to fight tumors by shifting myeloid cells from a suppressive state to a stimulatory state and promoting antitumor activity.
        - The disclosure of NGM831 coincided with a publication in *Cancer Immunology Research*, a journal of the American Association for Cancer Research, describing our discovery of one of ILT3's functional ligands, fibronectin, a key component of the tumor stroma.

- ***Looking forward:*** We expect to initiate first-in-human testing of NGM831 in patients with advanced solid tumors in the first quarter of 2022.

- **NGM438**. NGM438 is an antagonist antibody that is designed to inhibit leukocyte-associated immunoglobulin-like receptor 1, or LAIR1, and thereby promote anti-tumor immune responses. NGM438 has the potential to potently block the binding of all collagens to LAIR1, including tumor-derived collagens. Collagens produced by the tumor stroma are believed to bind LAIR1 to create an immuno-suppressive tumor microenvironment. The interaction of collagens from the tumor stroma 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.

  - ***Looking forward:*** We expect to initiate first-in-human testing of NGM438 in patients with advanced solid tumors in the second quarter of 2022.

- **NGM120**. NGM120 is an antagonist antibody that binds to glial cell-derived neurotrophic factor receptor alpha-like, or GFRAL, and is designed to block the effects of elevated serum levels of growth differentiation factor 15, or GDF15. We designed NGM120 as a potent, humanized monoclonal antibody inhibitor of GFRAL with the potential for once-monthly or less frequent dosing. Preclinical studies suggest that NGM120 may reduce tumor growth and improve survival in syngeneic orthotopic pancreatic tumor models.

  - We are conducting the Phase 1/2 PINNACLES clinical trial to assess NGM120’s effect on cancer and cancer-related cachexia in patients with select advanced solid tumors and metastatic pancreatic cancer. We are currently enrolling patients into a Phase 2 component of the ongoing PINNACLES clinical trial. This Phase 2 component of the PINNACLES trial is testing NGM120 in combination with gemcitabine and Nab-paclitaxel as first-line treatment in patients with metastatic pancreatic cancer.

  - In September 2021, at the European Society for Medical Oncology, or ESMO, Virtual Congress, we reported preliminary findings from two Phase 1 dose-escalation cohorts of the PINNACLES trial, including 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 Nab-paclitaxel in patients with metastatic pancreatic cancer. The preliminary results reported at ESMO showed that NGM120 was well tolerated with no dose-limiting toxicities and provided encouraging initial signals of anti-cancer activity in patients with advanced solid tumors.

  - ***Looking forward***: We plan to report additional data from the Phase 1a and Phase 1b cohorts of the PINNACLES trial in the second half of 2022.

- **Retinal diseases**.

  - **NGM621**. NGM621 is a humanized Immunoglobulin 1, or IgG1, monoclonal antibody administered via intravitreal, or IVT, injection. NGM621 was engineered to potently bind to, and be a long-acting inhibitor of, complement C3 with the treatment goal of reducing disease progression in patients with geographic atrophy, or GA, secondary to age-related macular degeneration.

    - Data from a Phase 1 trial we conducted showed that NGM621 was well tolerated, with no patients experiencing serious adverse events, or SAEs, or drug-related adverse events. Ocular adverse events observed were mild in severity and representative of those commonly associated with IVT injections.

    - In July 2021, we completed enrollment of the ongoing Phase 2 CATALINA clinical trial, enrolling 320 patients at 65 sites in the United States. The CATALINA trial was designed to be a Phase 3-supportive or -enabling clinical trial and is evaluating the efficacy and safety of NGM621 when given to patients with GA every four weeks or every eight weeks via IVT injections compared to sham control.

    - In February 2022, NGM621 received Fast Track designation from the United States Food and Drug Administration, or FDA, for GA secondary to age-related macular degeneration.

    - ***Looking forward***: We expect to report topline data from the Phase 2 CATALINA trial in the fourth quarter of 2022. We plan to use the CATALINA trial results and guidance from the FDA

to inform Phase 3 planning and design for NGM621. Merck has a one-time option to license NGM621 and its related compounds upon completion of the ongoing Phase 2 CATALINA clinical trial (either alone or bundled with all of the other ophthalmology compounds and their respective related compounds included within the scope of the current collaboration with Merck).

- **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. In May 2021, we announced that the ALPINE 2/3 Phase 2b trial of aldafermin in patients with non-alcoholic steatohepatitis, or NASH, and liver fibrosis stage 2 or 3, or F2 or F3, did not meet its primary endpoint. As a result, we decided to suspend further development of aldafermin in patients with F2/F3 NASH, allowing for the reallocation of resources to advancing our other programs. Aldafermin remains in Phase 2b development in the ALPINE 4 trial for the treatment of patients with compensated NASH cirrhosis (liver fibrosis stage 4, or F4).
    - In January 2022, we completed enrollment of 160 patients in the United States, Europe, Hong Kong and Australia in our Phase 2b ALPINE 4 clinical trial of aldafermin. The ALPINE 4 clinical trial is designed to evaluate the treatment effect of aldafermin over 48 weeks in a population of patients with NASH with F4 liver fibrosis and well-compensated cirrhosis. We recently updated the design of the ALPINE 4 trial, elevating the Enhanced Liver Fibrosis, or ELF, test, a reproducible, quantitative non-invasive liver prognostic test that evaluates liver fibrosis and correlates to liver-related outcomes, to be the primary endpoint for the trial. The ELF test is a composite blood test measuring the presence of three biomarkers associated with liver matrix metabolism. Liver biopsy data will also be measured and reported as a secondary endpoint upon completion of the trial.
    - ***Looking forward:*** We expect to report topline data from the Phase 2 ALPINE 4 trial in the first half of 2023.
  - **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, in Phase 2b development for the treatment of NASH, was licensed by Merck in November 2018.
    - Merck is continuing enrollment in the worldwide 52-week randomized, double-blind Phase 2b trial of MK-3655 in patients with NASH and F2 or F3 liver fibrosis that it initiated in the fourth quarter of 2020.

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, the sufficiency of our cash resources, 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.

Operational Updates

Partnering has been and is expected to continue to be a key component of our strategy. For example, our collaboration with Merck, described in " — Our Merck Collaboration" below, historically provided us with robust financial support that enabled us to broaden and accelerate our research efforts and to develop more product candidates for major indications than we likely could have advanced on our own. Given the breadth of opportunities produced by our prolific discovery engine, and the narrower scope of our Merck collaboration going forward, we may decide to pursue additional strategic partners to progress, in whole or in part, some of our wholly-owned product candidates and/or commercialize any resulting approved product.

We do not own, and have no plans to establish, any manufacturing facilities. 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, which 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, or R&D, resources are focused, and will continue to be focused, on the manufacture and testing of clinical trial materials. If our CROs and CMOs fail to satisfy their contractual duties to us or meet expected deadlines or if our CMOs experience difficulties in scaling production, higher than anticipated costs or lower than anticipated yields, 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, difficulties with quality control, product stability or quality assurance testing, or difficulties procuring raw materials or components as a result of the ongoing COVID-19 pandemic or otherwise, our ongoing and planned trials and possible acceleration or expansion of those trials may be delayed, perhaps substantially, or abandoned, which could materially and adversely affect our business. For example, while we expect to commence first-in-human testing of NGM831 in the first quarter of 2022 and of NGM438 in the second quarter of 2022, our planned individual new drug application, or IND, submissions for NGM438 and NGM831 were delayed due to challenges at one of our CMOs with respect to the manufacture of those product candidates, primarily related to analytical method qualification and release testing. It is possible that we could experience further supply-related delays that would create supply challenges and possible timing delays for ongoing and planned clinical trials or delay the commencement of first-in-human testing of future product candidates. In addition, there is increased competition in the biotechnology industry for CMO manufacturing slots and other capabilities generally, which has had, and may continue to have, a negative impact on the availability of manufacturing capacity and therefore our ability to supply clinical trial materials for planned, ongoing, accelerated or expanded clinical trials. Our CMOs' facilities and operations have also been adversely affected by labor, raw material and component shortages, high turnover of staff and difficulties in hiring trained and qualified replacement staff. Changes in economic conditions, supply chain constraints, labor, raw material and component shortages and steps taken by governments and central banks, particularly in response to the COVID-19 pandemic as well as other stimulus and spending programs, could lead to higher inflation than previously experienced or expected, which could, in turn, lead to an increase in costs. These supply chain effects, increased competition and higher costs of acquired goods and services may negatively impact our business operations and our financial results.

In addition, all of our product candidates other than aldafermin and MK-3655 are currently manufactured at a facility in Lithuania. At the end of 2021 and into 2022, tensions between Russia and the United States and its allies escalated when Russia amassed large numbers of military ground forces and support personnel on the Ukraine-Russia border and, in February 2022, Russia invaded Ukraine. While the situation is evolving and fluid at the time of filing of this Annual Report on Form 10-K, the response from the United States and its allies has included both economic sanctions and NATO's deployment of additional military forces to Eastern Europe, including to Lithuania. The invasion of Ukraine and the retaliatory measures taken or that may be taken by the United States, NATO and others create global security concerns, including the possibility of expanded regional or global conflict, and are likely to have short-term and likely longer-term negative impacts on regional and global economies, any or all of which could disrupt our supply chain and adversely affect our ability to conduct ongoing and future clinical trials of our product candidates and our ability to raise capital on favorable terms.

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 our decision not to proceed with development activities on multiple potentially viable product candidates for portfolio management reasons to concentrate our resources on what we consider our most promising product candidates. However, given the substantial decrease in research funding we will receive from Merck beginning in 2022 commensurate with the decreased collaboration scope described below, going forward we will need to devote a substantial amount of our own financial resources to our R&D programs, and we may need to delay or suspend development activities on product candidates that we consider promising unless and until we are able to raise sufficient additional capital and/or we will need to enter into additional collaborations in order to proceed with such development through to regulatory approval.

Our Merck Collaboration

In 2015, we entered into a research collaboration, product development and license agreement with Merck, which, together with amendments made prior to June 30, 2021, is referred to as the Original 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 us with input from Merck. The original research phase of the collaboration was for five years and was extended for an additional two years by Merck through March 2022. As part of that extension, Merck agreed to continue to fund up to $75.0 million of our R&D efforts each year consistent with the initial five-year research 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 R&D activities during 2021 through the first quarter of 2022.

On June 30, 2021, we entered into an amended and restated research collaboration, product development and license agreement with Merck, or the Amended Collaboration Agreement, replacing the Original Collaboration Agreement and extending the research phase of the collaboration, but with a narrower scope than in the Original Collaboration Agreement. Under the Amended Collaboration Agreement, the collaboration is focused primarily on the identification, R&D of collaboration compounds directed to targets of interest to Merck in the fields of ophthalmology and cardiovascular or metabolic, or CVM, disease, including heart failure. The ophthalmology compounds in the collaboration include NGM621 (and its related compounds) and compounds directed against two other undisclosed ophthalmology targets (and their related compounds). The collaboration scope also includes certain laboratory testing and other activities on compounds that are directed to one of up to two undisclosed targets outside of the fields of ophthalmology and CVM disease, or the Lab Programs. The research phase will now continue generally through March 31, 2024, with possible extensions for each of the various programs to allow us or Merck to complete ongoing development.

Under the Amended Collaboration Agreement, Merck committed to provide up to $86.0 million in R&D funding for the four calendar quarters ending March 31, 2022. Merck is providing significantly more limited annual R&D funding beginning in 2022. For the period starting on April 1, 2022 and ending on March 31, 2024, Merck will provide up to $20.0 million of R&D funding for the ophthalmology programs (other than NGM621), the CVM-related programs and the Lab Programs. If the parties mutually agree to extend the research phase for the CVM-related programs from March 31, 2024 to March 31, 2026, then Merck will provide up to a total of $20.0 million in R&D funding during the additional two years of the CVM program research phase. Merck will also fund certain R&D costs related to NGM621 in an amount expected to be up to approximately $20.0 million, until the earlier of Merck's decision to exercise, or not to exercise, its License Option with respect to NGM621 alone or bundled with the other continuing ophthalmology compounds (as described below and in "Business - Our Collaboration with Merck - Description of Amended Collaboration Agreement" in Part I, Item 1 of this Annual Report on Form 10-K) or, March 31, 2024.

In addition, we have certain obligations to conduct R&D related to collaboration compounds that will not be reimbursed by Merck. We are required to use commercially reasonable efforts to research and develop a specific product candidate directed to an ophthalmology target to be ready by March 31, 2023 for starting investigational new drug application-, or IND-, enabling studies and we are responsible for the cost of such work after March 2022. We will have additional R&D funding obligations under the collaboration of up to $5.0 million or $15.0 million in the event that Merck, as described in greater detail below, exercises its License Option to NGM621 alone or bundled with the other continuing ophthalmology compounds, respectively, and pays us the applicable option exercise fee. We also may spend more than the amounts we will be reimbursed by Merck for activities related to collaboration compounds, including certain NGM621 costs necessary to avoid delays in Phase 3 readiness.

Under the Original Collaboration Agreement, upon the completion of each proof-of-concept clinical trial under the program, Merck had a one-time option to obtain a worldwide, exclusive license to the product candidate tested in the trial and compounds related to it, referred to as a License Option. Under the Amended Collaboration Agreement, Merck retains a License Option to each collaboration compound and its related compounds upon completion of a human proof-of-concept trial for a particular collaboration compound, regardless of the results of such trial, or at earlier points as specified in the Amended Collaboration Agreement, including the option to license NGM621 and its related compounds upon completion of a human proof-of-concept trial (either alone or bundled with all of the other ophthalmology collaboration compounds and their respective related compounds included within the scope of the Amended Collaboration Agreement). For each program for which Merck exercises its License Option and pays the applicable option exercise fee, Merck is responsible for any further development and commercialization activities for the licensed compounds and we have the option, when a licensed compound has advanced to Phase 3 clinical trials, to receive milestones and royalty payments or, in certain cases, to co-fund development and participate in a global cost and profit share arrangement of up to 50%, with an additional option to co-detail any such licensed compounds in the United States. If Merck does not exercise a License Option within the specified time period, then we would be free to develop and commercialize the product candidate tested in the proof-of-concept trial and its related compounds independently or with third-party partners, subject to an obligation to make low single-digit royalty payments to Merck. Merck exercised its License Option for MK-3655 and its related FGFR1c/KLB agonists in November 2018 under the Original Collaboration Agreement.

As a result of entering into the Amended Collaboration Agreement, we have the right to independently research, develop and commercialize all of the clinical, preclinical and research assets that we researched or developed under the Original Collaboration Agreement that are now outside the narrower scope of the collaboration,

including NGM707, NGM831, NGM438 and NGM120, subject to an obligation to make low single-digit royalty payments to Merck. The parties' rights and obligations remain the same with respect to MK-3655 and its related FGFR1c/KLB agonists. We also have full rights to all future programs we pursue that fall outside of the scope of the specific therapeutic areas and programs included in Amended Collaboration Agreement.

Similar to the Original Collaboration Agreement, during the applicable research phase (including any applicable tail period for each program as described in "Business - Our Collaboration with Merck - Description of Amended Collaboration Agreement" in Part I, Item 1 of this Annual Report on Form 10-K) for the ophthalmology programs, CVM-related programs and Lab Programs, we may not directly or indirectly research, develop, manufacture or commercialize, outside of the collaboration, any product with specified activity against any target that is being researched or developed under the applicable programs and, if Merck exercises its License Option for a 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 program for so long as Merck's license to it remains in effect. In addition, under the Amended Collaboration Agreement, we are prohibited from directly or indirectly researching, developing or commercializing any product for the treatment of heart failure with preserved ejection fraction, or HFpEF, during the research phase for the CVM-related programs.

Because, under the Amended Collaboration Agreement, the level of R&D funding from Merck will be substantially lower on an annual and overall basis beginning in 2022 than the R&D funding previously provided by Merck, we will need to devote a substantial amount of our own financial resources to our R&D programs, particularly with respect to our wholly-owned programs, and, to a lesser extent, with respect to programs that are within the scope of the collaboration under the Amended Collaboration Agreement that we are required to fund. In addition, our funding requirements would increase for any programs that are within the scope of the current collaboration in the event Merck does not elect to license these programs and we decide to continue them, in the event Merck elects to terminate its license to any program it licenses and we decide to continue it or in the event we opt to co-develop any Merck-licensed programs. Accordingly, we will need to raise significant additional capital and/or we will need to enter into additional collaborations in order to proceed with development through regulatory approval and commercialization of our current and potential future product candidates. Neither may be possible and, as a result, if adequate funds are not available when we need them, we may need to significantly delay, scale back or discontinue development of some or all of such product candidates or scale back or discontinue discovery efforts, which could have a material adverse effect on our business, operating results and prospects, or we may be required to cease operations altogether.

For more information on the terms of the Amended Collaboration Agreement, see "Business - Our Collaboration with Merck - Description of Amended Collaboration Agreement" in Part I, Item 1 of this Annual Report on Form 10-K and Note 5, "Research Collaboration and License Agreements," of the notes to audited consolidated financial statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Financial Highlights

Since inception, we have funded our operations primarily through:

- fees received from collaboration partners, primarily Merck, which since inception through December 31, 2021 includes reimbursement of R&D expenses of $497.7 million, and 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 private placements 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 $22.1 million from sales of 817,100 shares of our common stock under an Open Market Sale Agreement℠, or the Sales Agreement, we entered into with Jefferies LLC, or Jefferies, in June 2020 (809,700 shares sold at an average price of $27.94 per share in December 2020 and 7,400 shares sold at an average price of $27.22 per share in September 2021); and
- net proceeds of $134.6 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, 2021, we had $366.3 million in cash, cash equivalents and short-term marketable securities.

We have incurred net losses each year since our inception. As of December 31, 2021, we had an accumulated deficit of $419.0 million. Substantially all of our net losses have resulted from costs incurred in connection with our R&D programs and general and administrative, or G&A, 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 Merck or future collaboration partners, if any, particularly after March 2022. 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, employees, clinical trial investigators and site staff, while maintaining business continuity. Following guidance from federal, state and local authorities, we operated with a primarily remote work model from March 2020 through October 2021, under which employees working on site were mostly individuals conducting essential in-person laboratory work and other business functions considered essential under COVID-19 regulations and guidance, while others worked remotely. In October 2021, we allowed additional employees to return to onsite work. With the increased rate of transmission experienced with the Omicron SARS-CoV-2 variant in early 2022, we pivoted to temporarily discouraging in-person meetings and presence on site unless necessary to perform one’s job responsibilities. There were relatively minor impacts on overall productivity as we operated under a remote work model and under our current hybrid work model. However, the labor market has tightened significantly since the beginning of the COVID-19 pandemic, and we have experienced employee attrition at rates higher than we experienced historically, together with an increased rate of hiring new employees. We cannot predict whether these trends will continue or be exacerbated, the impact of COVID-19 on future productivity or whether or when we may be required to return to a more restrictive work model as the pandemic continues to evolve.

For patients enrolled in our clinical trials, we 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. During the COVID-19 pandemic, 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, and we experienced a higher subject dropout rate in our aldafermin ALPINE 2/3 trial than we had anticipated based on our previous trials in patients with NASH. We believe this may be due to factors such as the vulnerability of our studied patient populations, clinical trial site suspensions, reallocation of medical resources, site staff shortages and the challenges of working remotely due to shelter-in-place and similar government orders and guidelines, 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 developed and implemented additional clinical 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 with trial participants, remote monitoring of clinical trial sites and other measures, as appropriate, designed to ensure that data from our clinical trials that may be temporarily disrupted as a result of safety measures during the COVID-19 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 sites' institutional review boards, or IRBs, or ethics committees. 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, as the COVID-19 pandemic continues, there may continue to be negative impacts on our ability to initiate new clinical trial sites, to enroll new patients and to retain existing patients participating in our clinical trials. These negative impacts may include increased clinical trial costs, longer timelines and delay in our ability to obtain regulatory approvals of our product candidates, if at all.

We also could see an adverse impact on our ability to report clinical trial results, or interact with or receive a timely response from regulators, IRBs and ethics committees or other important agencies due to limitations in health 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 yet experienced significant disruption to drug or related component supply for our ongoing clinical trials due to the COVID-19 pandemic, our contract manufacturers' facilities and operations have been adversely affected by labor, raw material and component shortages, high turnover of staff and difficulties in hiring trained and qualified replacement staff. These difficulties have resulted in some delays in early development timelines and we could experience more significant disruptions to our supply chain and operations as a result of the evolving effects of the continuing COVID-19 pandemic. If our contract manufacturers are required to obtain an alternative source of certain raw materials and components, for example, additional testing, validation activities and regulatory approvals may be required, which can also have a negative impact on timelines. Any associated delays in the manufacturing and supply of drug substance and drug product for our clinical trials could adversely affect our ability to conduct ongoing and future clinical trials of our product candidates on our anticipated development timelines. For example, early in the pandemic, our aldafermin drug product manufacturer 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 contract manufacturers or raw materials or components suppliers become subject to acts or orders of U.S. or foreign government entities requiring them to allocate or prioritize manufacturing capacity, raw materials and components to the manufacture or distribution of COVID-19 vaccines or medical supplies needed to treat COVID-19 patients, this could delay our clinical trials, perhaps substantially, which could materially and adversely affect our business.

While the potential economic impact caused by, and the duration of, the COVID-19 pandemic is difficult to assess or predict, the COVID-19 pandemic could result in significant and prolonged disruption of global financial markets, and our ability to raise additional capital through public or private equity or debt offerings may be adversely impacted by disruptions to, and volatility in, the credit and financial markets in the United States and worldwide, and in the biotechnology industry specifically, which could negatively affect the financial resources available to us. In addition, economic 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. Finally, 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 Amended Collaboration Agreement. 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

Related Party Revenue

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

Since the Company's inception through December 31, 2021, Merck paid us $572.9 million pursuant to the terms of our collaboration. Due to the nature of our collaboration 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, particularly beginning in April 2022, given the substantial decrease in the level of funding we will receive from Merck under with the Amended Collaboration Agreement commensurate with the decreased collaboration scope. As a result, we believe that period-to-period comparisons of our revenue may not be meaningful and should not be relied upon as being indicative of future performance.

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 under the Amended Collaboration Agreement could have a material impact on revenue recognized (including the possible reversal of previously recognized revenue) at each reporting period.

In the past three years, our related party revenue was as follows (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Related party revenue	$ 77,882	$ 87,368	$ 103,544

Research and Development Expenses

R&D efforts include drug discovery and other 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 efforts are extensive and costly. Our R&D expenses related to the development of our product candidates 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, and the costs of continued testing, such as process validation testing and stability testing, 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.

As a result of the substantial decrease in the level of funding we will receive from Merck under with the Amended Collaboration Agreement commensurate with the decreased collaboration scope as described above, beginning in 2022, we will need to devote a substantial amount of our own financial resources to our development programs, particularly with respect to our wholly-owned programs and, to a lesser extent, with respect to programs that are within the scope of the Amended Collaboration Agreement that we are required to fund, as described above. In addition, our funding requirements would increase for any programs that are within the scope of the collaboration in the event Merck does not elect to license these programs and we decide to continue them, in the event Merck elects to terminate its license to any program it licenses and we decide to continue it or in the event we opt to co-develop any Merck-licensed programs. For the foreseeable future, we anticipate a significant portion of our financial resources, other than those received from Merck which are dedicated to activities under the Amended Collaboration Agreement, will be directed to activities required to advance initiate and advance clinical trials of our oncology programs, to prepare for the manufacture of NGM621 in anticipation of a potential Phase 3 trial and to complete the Phase 2b ALPINE 4 clinical trial of aldafermin.

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, including raw materials and components;
- 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 within the scope of the collaboration and the timing of such election or termination;
- the amount of our financial resources that we will need to devote to our development programs and our obligations under the Amended Collaboration Agreement, and our ability to raise adequate additional capital or enter into collaborations to meet our funding requirements;
- 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, including timing and receipt of regulatory approvals.

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, as well as the timing, associated with the development of that product candidate. For example, if the FDA or a comparable foreign health 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 Third Parties,” “—Risks Related to Regulatory Approvals” and "—Risks Related to Our Intellectual Property” in Part I, Item 1A of this Annual Report on Form 10-K.

General and Administrative Expenses

G&A 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 G&A expenses will increase in the future to support our continued and increasing 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 Securities and Exchange Commission, or SEC, requirements and costs related to insurance, investor relations and compliance with Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act. In addition, we may incur expenses associated with negotiating and entering into agreements with collaboration partners and 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	
	2021	2020	2019	2021 vs 2020	2020 vs 2019
Related party revenue	$ 77,882	$ 87,368	$ 103,544	$ (9,486)	$ (16,176)
Operating expenses:					
Research and development	161,712	163,972	129,253	(2,260)	34,719
General and administrative	36,865	27,229	23,631	9,636	3,598
Total operating expenses	198,577	191,201	152,884	7,376	38,317
Loss from operations	(120,695)	(103,833)	(49,340)	(16,862)	(54,493)
Interest income, net	420	1,939	6,692	(1,519)	(4,753)
Other expense, net	(60)	(593)	(147)	533	(446)
Net loss	$ (120,335)	$ (102,487)	$ (42,795)	$ (17,848)	$ (59,692)

Related Party Revenue from Merck

Revenue decreased $9.5 million in the year ended December 31, 2021 compared to the same period in 2020 primarily due to a reduction in revenue of $4.6 million for an amount we had recorded under the prior two-year extension of the research phase that was no longer billable to Merck under the Amended Collaboration Agreement as of June 30, 2021 and a $3.9 million decrease related to the recognition of the remaining portion of an upfront payment in the first quarter of 2020.

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.

Under the Amended Collaboration Agreement, for the period starting on April 1, 2022 and ending on March 31, 2024, Merck will provide up to $20.0 million of R&D funding for the ophthalmology programs (other than NGM621), the CVM-related programs and the Lab Programs. If the parties mutually agree to extend the research phase for the CVM-related programs from March 31, 2024 to March 31, 2026, then Merck will provide up to a total of $20.0 million in R&D funding during the additional two years of the CVM program research phase. Merck will also fund certain R&D costs related to NGM621 in an amount expected to be up to approximately $20.0 million, until the earlier of Merck's decision to exercise, or not to exercise, its License Option with respect to NGM621 alone or bundled with the other continuing ophthalmology compounds, or, March 31, 2024. In this regard, we expect our related party revenue from Merck will decrease substantially in 2022 compared to 2021 and continue to remain at a significantly lower level during the remainder of the collaboration.

Due to the nature of our collaboration 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, particularly after March 2022.

Research and Development Expenses

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

	Year Ended December 31,		
	2021	2020	2019
External R&D expenses:			
Aldafermin (FGF19 analog)	$ 31,766	$ 50,553	$ 32,001
NGM621 (C3 inhibitor)	20,415	13,126	4,420
NGM120 (GFRAL antagonist)	6,856	5,606	3,414
NGM707 (Anti-ILT2/ILT4 dual antagonist)	5,521	4,817	2,295
NGM438 (LAIR1 antagonist)	4,074	3,586	1,302
NGM831 (ILT3 antagonist)	2,377	4,756	2,128
Other external R&D expenses	1,437	4,822	11,257
Total external R&D expenses	72,446	87,266	56,817
Personnel-related expenses	56,209	43,811	38,171
Internal and unallocated R&D expenses (1)	33,057	32,895	34,265
Total R&D expenses	$ 161,712	$ 163,972	$ 129,253

(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 decreased $2.3 million in the year ended December 31, 2021 compared to the same period in 2020 primarily due to a decrease in expenses for our manufacturing activities and our clinical trials of aldafermin, partially offset by an increase in personnel-related expenses, including an increase in share-based compensation expense of $5.8 million, and an increase in external expenses driven by our ongoing clinical trials of NGM621, NGM120 and NGM707 and our preclinical studies of NGM438 and NGM831.

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 a product candidate for which development has since been suspended. The increase in R&D expenses in 2020 also included an increase of $5.6 million in personnel-related expenses and costs associated with preclinical IND-enabling studies for NGM707, NGM831 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.

We expect our R&D expenses will increase in 2022 compared to 2021 primarily due to our increased investment in our wholly-owned oncology programs. In 2022, we have substantial activities ongoing in all of our programs, and are targeting achievement of multiple milestones, including:

- NGM621: continuing treatment of patients in the fully enrolled Phase 2 CATALINA clinical trial, preparing to report topline data from that trial in the fourth quarter of 2022 and preparing for a potential Phase 3 trial;
- NGM707: continuing enrollment in the Phase 1 portion of the ongoing Phase 1/2 clinical trial and preparing for a readout of initial data from the Phase 1a cohort in the second half of 2022;

- NGM120: continuing enrollment in the Phase 2 portion of the Phase 1/2 PINNACLES clinical trial and preparing to report additional data from the Phase 1a and Phase 1b cohorts of the PINNACLES trial in the second half of 2022;
- NGM831: conducting a Phase 1 clinical trial expected to be initiated in the first quarter of 2022;
- NGM438: conducting a Phase 1 clinical trial expected to be initiated in the second quarter of 2022; and
- Aldafermin: continuing treatment of patients in the fully enrolled Phase 2b ALPINE 4 clinical trial and preparing to report topline data from that trial in the first half of 2023.

General and Administrative Expenses

G&A expenses increased $9.6 million in the year ended December 31, 2021 compared to the same period in 2020 primarily due to an increase in personnel-related expenses due to increased headcount, an increase in share-based compensation expense of $4.7 million and a $2.5 million increase in fees paid to outside consultants, lawyers and accountants. G&A 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.

We anticipate that our G&A expenses in 2022 will increase compared to 2021 due to an increase in compensation-related expenses driven by higher headcount and other expenses related to the expansion and support of our business, in particular as needed to support our continued and increasing R&D activities, and to a lesser extent due to expenses associated with being a public company and with negotiating and entering into agreements with collaboration partners.

Interest Income, net

Interest income, net decreased $1.5 million in the year ended December 31, 2021 compared to the same period in 2020 primarily due to an increase in unrealized losses in marketable securities offset by an increase in interest income due to an increase in our average cash balance. Interest income, net 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.

Liquidity and Capital Resources

Funding Requirements

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, and we expect to incur significant and increasing operating losses in 2022 and over the next several years. As of December 31, 2021, we had an accumulated deficit of $419.0 million, and we expect our accumulated deficit will increase significantly over time.

We have an active discovery research group and multiple pipeline programs in development. We have spent, and expect to continue to spend, significant resources to fund R&D of, and seek regulatory approvals for, our product candidates for the foreseeable future as our research, development, manufacturing, preclinical studies, clinical trial and related activities increase.

Prior to 2022, we received substantial R&D funding from our collaboration with Merck. However, under the narrower scope of the Amended Collaboration Agreement, beginning in 2022, R&D funding from Merck will be substantially lower on an annual and overall basis, than the R&D funding previously provided by Merck and, beginning in April 2022, we cannot use R&D funding from Merck to support the development of any of our wholly-owned oncology programs, including NGM707, NGM831, NGM438 and NGM120. As a result, we need to fund not only our currently wholly-owned programs going forward, but also certain activities that remain within the scope of the ongoing collaboration with Merck that we are required to fund ourselves (and our failure to allocate funding to meet such requirements may be deemed a breach of the Amended Collaboration Agreement). In addition, we will need to fund any programs that are within the scope of the current collaboration with Merck in the event Merck does not elect to license these programs and we decide to continue to develop them, in the event Merck elects to terminate its license to any program it licenses and we decide to continue to develop it or in the event we opt to co-develop any program Merck elects to license, which could include NGM621.

Our cash requirements for fiscal year 2022 are expected to consist primarily of our R&D and G&A expenses. In 2021 and 2020, our R&D expenses were $161.7 million and $164.0 million, respectively. In 2022 and over the next several years, we expect our R&D expenses to increase substantially unless we partner one or more of our wholly-owned programs, particularly as we advance our oncology product candidates into and through clinical

development and support our later-stage clinical development of NGM621. In 2021 and 2020, our G&A expenses were $36.9 million and $27.2 million, respectively. Beginning in 2022 and over the next several years, we expect our G&A expenses to increase moderately as we continue to hire additional personnel to support our growing R&D activities and as we continue to incur the increased costs associated with being a public company.

We believe that our existing cash, cash equivalents and short-term marketable securities will be sufficient to fund our operations for at least twelve months from the date this Annual Report on Form 10-K is filed. 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. Nonetheless, in order to advance our current and potential future product candidates through development and to regulatory approval and commercialization, we will need to raise significant additional capital or we will need to partner one or more of our wholly-owned programs and obtain funding or other resources through such arrangements. Neither may be possible and, as a result, we may be required to delay, scale back or discontinue development of such product candidates, which could have a material adverse effect on our business, operating results and prospects.

Sources of Liquidity

Cash and Investments

As of December 31, 2021, we had cash and cash equivalents of $151.8 million and short-term marketable securities of $214.5 million. In January 2021, we sold 5,324,074 shares of our common stock upon completion of the follow-on offering for aggregate net proceeds of $134.6 million.

Merck Collaboration

The revenue we receive under the Amended Collaboration Agreement with Merck is currently our only source of revenue. For the period starting on April 1, 2022 and ending on March 31, 2024, Merck is committed to fund up to $20.0 million of R&D funding for the ophthalmology programs (other than NGM621), the CVM-related programs and the Lab Programs. Merck is also obligated to fund certain R&D costs related to NGM621 in an amount expected to be up to approximately $20.0 million, until the earlier of Merck's decision to exercise, or not to exercise, its license option with respect to NGM621 alone or bundled with the other continuing ophthalmology compounds or, March 31, 2024. See “Overview – Our Merck Collaboration” above.

Other Sources of Capital

In June 2020, we entered into the Sales Agreement with Jefferies. 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. As of December 31, 2021, $127.2 million of our common stock remained available to be sold under the Sales Agreement, subject to conditions specified in the Sales Agreement.

We plan to finance our future cash needs through public or private equity or debt offerings, including under the Sales Agreement, product collaborations, strategic alliances, licensing arrangements or a combination of these potential financing sources. Additional capital may not be available in sufficient amounts, on reasonable terms or when we need it, if at all.

Our ability to raise additional capital through public or private equity or debt offerings 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, and in the biotechnology industry specifically, resulting from, among other things, the continuing effects of the COVID-19 pandemic and geopolitical instability. 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.

We may seek other third-party collaborators for the development and commercialization of any product candidates that are not within the scope of the collaboration with Merck. If we decide to enter into any such arrangements with any third parties, and are successful in doing so, 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 any such arrangement will depend on the specific terms we reach with any collaborator, as well as each of our collaborators' abilities to successfully perform the functions assigned to them in such arrangement towards developing, seeking regulatory approval for and commercializing our product candidates.

If we are unable to raise adequate additional capital through public or private equity or debt offerings, collaborations or otherwise, on acceptable terms or at all, we may be delayed in or prevented from pursuing our planned and any future 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 for the periods indicated:

	Year Ended December 31,		
	2021	2020	2019
Net cash provided by (used in):			
Operating activities	$ (73,229)	$ (83,496)	$ (41,174)
Investing activities	(71,650)	(50,998)	48,723
Financing activities	149,657	35,538	180,751
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 4,778	$ (98,956)	$ 188,300

Operating Activities

Cash used in operating activities in 2021 was $73.2 million, which consisted of a net loss of $120.3 million, adjusted for non-cash charges of $42.9 million and a change in operating assets and liabilities of $4.2 million. The non-cash charges consisted primarily of stock-based compensation expense of $26.2 million, depreciation expense of $6.1 million, a decrease in related party contract assets due to the Amended Collaboration Agreement with Merck of $4.6 million, amortization of a premium on marketable securities of $3.5 million and noncash lease expense of $1.8 million. The change in operating assets and liabilities was mainly driven by increases in contract liabilities of $17.8 million, related party receivable of $4.6 million, prepaid expenses and other current assets of $4.1 million and accrued liabilities of $2.9 million, partially offset by decreases in operating lease liabilities of $4.8 million, accounts payable of $4.4 million and related party contract assets of $1.5 million.

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 Accounting Standards Update, or ASU, 2014-09, Revenue from Contracts with Customers (Topic 606), referred to as ASC 606, and the timing of advance payments from Merck related to the reimbursement of costs associated with R&D activities.

Investing Activities

Cash used in investing activities in 2021 was $71.7 million, which consisted of purchases of marketable securities of $293.5 million primarily from the net proceeds of the follow-on offering, partially offset by $223.5 million

in net proceeds on maturity of marketable securities. 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.

Financing Activities

Cash provided by financing activities in 2021 was $149.7 million, which consisted of net proceeds from the follow-on offering of $134.6 million and proceeds from employee equity incentive and purchase plans of $14.9 million. 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.

Contractual Obligations

We have contractual obligations related to our lease liabilities. See Note 6 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 information regarding our lease commitments.

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 are not considered to be contractual obligations. Significant portions of our R&D resources are focused, and will continue to be focused, on the manufacture and testing of clinical trial materials. We expect our R&D expenses to increase substantially beginning in 2022 and over the next several years unless we partner one or more of our wholly-owned programs, particularly as we advance our oncology product candidates into and through clinical development and support our later-stage clinical development of NGM621. See "Funding Requirements" above for additional information regarding our expected R&D spend.

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 and are not considered to be contractual obligations. See "Business - Licensing Arrangements" in Part I, Item 1 of this Annual Report on Form 10-K for additional information regarding our current in-license agreements.

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.

While 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 critical accounting policies are the most important policies in understanding and evaluating our financial condition and results of operations because they are complex and relate to the more significant areas involving management’s judgment.

Revenue Recognition

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) the Company satisfies a performance obligation.

All of our revenue to date has been generated from collaboration agreements, primarily the collaboration agreement with Merck. The terms of these agreements generally require us to provide (i) license options for our compounds, (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.

We assess whether the promises in our 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 R&D services or participation in research and steering committees, as well as whether options create material rights in the contract. In situations when a contract includes distinct services that are substantially the same and have the same pattern of transfer to the customer over time, they are recognized as a series of distinct services.

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. The unconstrained variable consideration amount included in the transaction price represents an amount for which it is probable that a significant reversal of cumulative revenue recognized will not occur. We typically submit a budget for the R&D services to our 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, the 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 re-evaluate estimated costs to satisfy a performance obligation each reporting period and make adjustments for any significant changes. In applying the cost-based input method, we measure actual costs incurred relative to budgeted costs to fulfill our performance obligation. These budgeted costs consist of our employee full-time equivalent hours plus allowable external (third-party) costs incurred. Management applies considerable judgment in estimating expected costs as such costs are key inputs when applying the cost-based input method. We recognize revenue based on actual costs incurred as a percentage of total budgeted costs as we complete a performance obligation applied to the transaction price. A significant change in the estimate of expected costs for the remainder of a 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 a related impact on contract assets and liabilities.

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 health 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 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, 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.

Contract modifications, defined as changes in the scope or price (or both) of a contract that are approved by the parties to the contract, such as a contract amendment, exist when the parties to a contract approve a

modification that either creates new, or changes existing, enforceable rights and obligations of the parties to the contract. Depending on facts and circumstances, we account for a contract modification as one of the following: (i) a separate contract; (ii) a termination of the existing contract and a creation of a new contract; or (iii) a combination of the preceding treatments. A contract modification is accounted for as a separate contract if the scope of the contract increases because of the addition of promised services that are distinct and if the price of the contract increases by an amount of consideration that reflects our standalone selling prices of the additional promised services. When a contract modification is not considered a separate contract and the remaining services are distinct from the services transferred on or before the date of the contract modification, we account for the contract modification as a termination of the existing contract and a creation of a new contract. When a contract modification is not considered a separate contract and the remaining services are not distinct, we account for the contract modification as an add-on to the existing contract and as an adjustment to revenue on a cumulative catch-up basis.

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

We account for stock-based compensation arrangements in accordance with Topic 718, Compensation—Stock Compensation. On January 1, 2019, we adopted ASU 2018-07, Compensation – Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting, which expanded the scope of Topic 718 to include share-based payment transactions with nonemployees.

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

We use the Black-Scholes option-pricing model to calculate the grant-date fair value of stock-based compensation awards. The Black-Scholes option-pricing model requires the use of subjective assumptions, including stock price volatility, the expected term that stock options will remain outstanding, risk-free interest rates and expected dividends.

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.

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 $366.3 million as of December 31, 2021, 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, 2021 and 2020, 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, 2021, 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, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 1, 2022 expressed an unqualified opinion thereon.

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 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. 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.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Related party revenue

Description of the Matter

Related party revenue was $77.9 million for the year ended December 31, 2021 and related to the ongoing collaboration with Merck Sharp & Dohme Corp., or Merck, which is focused primarily on the identification, research and development of collaboration compounds directed to targets of interest to Merck in the fields of ophthalmology and cardiovascular or metabolic, or CVM, diseases. As discussed in Notes 2 and 5 to the consolidated financial statements, the total transaction price in this arrangement represents the sum of potential funding amounts to be received from Merck through March 2024, for performing a series of distinct research and development services in the area of both the continuing collaboration compounds and the released NGM compounds and has one performance obligation. The Company submits a budget for the research and development services to Merck in advance of performing the services and uses the cost-based input method to calculate the amount of revenue to be recognized.

Revenue was recognized based on actual costs incurred as a percentage of total budgeted costs as the Company completed its performance obligation applied to the transaction price. The Company re-evaluated the estimate of expected costs to satisfy the performance obligation each reporting period and made adjustments for any changes. In addition, the Company also considered any necessary adjustments to the transaction price to ensure that it was within the range of potential funding amounts.

Auditing the Company's assessment of its obligation under this arrangement, including its determination of transaction price (including variable consideration) and the remaining research and development costs necessary to satisfy the Company's performance obligation over time, requires a high degree of audit judgment. The application of the cost-based input model is inherently sensitive to significant changes in the estimate of expected internal personnel and external costs to be incurred for the remainder of the contract term and therefore could have had a material impact on revenue recognized (including the possible reversal of previously recognized revenue) at each reporting period.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the Company's accounting assessment for this arrangement, including control attributes over management's identification of applicable activities to be performed under its obligation, as well as management's review of the accuracy and completeness of the underlying data and the significant assumptions used to estimate the total budgeted costs expected to be incurred to satisfy the respective activities under its performance obligation throughout the duration of the arrangement where the associated unconstrained transaction price is earned.

Our audit procedures included, among others, obtaining and reviewing the license and collaboration agreement and obtaining an understanding and evaluation of the performance obligations within the arrangement and expected transaction price, including variable consideration. We tested the Company's estimates of total expected costs by project, including both estimates for external costs to be incurred and internal personnel costs related to employees assigned to each project. We further tested the completeness and accuracy of the underlying data used by the Company in its assembly of its cost-based input model used to recognize revenue. Additionally, we compared the estimates of expected costs to actual costs incurred to evaluate the historical accuracy of management's estimates and performed corroborative inquiries with those outside of the finance department and inspected evidence of actual costs incurred.

Accrued clinical trials expenses

Description of the Matter

During the year ended December 31, 2021, the Company incurred $161.7 million in research and development related expenses, of which $12.1 million was recorded as accrued clinical trials expenses as of December 31, 2021. As described in Note 2 of the consolidated financial statements, the Company records accruals for its estimated costs of research and development activities, including contract services for clinical trials. Clinical trial activities performed by outside third-party service providers, including those performed by clinical research organizations (CRO), are recorded based upon estimates of the proportion of work completed over the life of the individual clinical trial and patient enrollment rates in accordance with agreements established with third-party service providers. Estimates are determined by reviewing contracts, vendor agreements and purchase orders, and through detailed discussions with internal clinical personnel and external service providers as to the progress or stage of completion of trials or services and then applying these estimates of completion to previously agreed-upon rates and fees to be paid for such services.

Auditing management's accounting estimates of accrued clinical trials expenses was especially challenging as evaluating the nature, progress, and stage of completion of the activities being performed under the Company's research and development agreements is dependent upon the accumulation of a high volume of information from internal clinical personnel and third-party service providers.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the accounting for accrued clinical trials expenses, including controls over management's review of clinical trial progress and activities in comparison to budgets and invoices received from third-party service providers.

Our audit procedures included, among others, testing the accuracy and completeness of the underlying data used by management to determine the amount of the accrued clinical trials expenses. Additionally, we inspected the terms and conditions of selected service providers' contracts and change orders, assessed patient enrollment as well as the activities to be performed for each patient, and tested the clinical cost models which calculate the costs incurred for the period under audit. We also agreed selected inputs used in a sample of clinical cost models back to contractual terms, performed inquiries with the Company's internal clinical personnel that oversee the clinical trials, as well as inspected information obtained by the Company directly from service providers. For a sample of contracts, we obtained external confirmation from service providers of key inputs to the clinical cost models, such as an amount of unbilled costs as of the balance sheet date, the number of patient visits, the number of sites activated and the progress of contracted clinical activities. Further, we inspected a sample of subsequent payments made and invoices received from service providers after the balance sheet date and compared such information back to the accruals recorded by the Company.

/s/ Ernst & Young LLP

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

Redwood City, California

March 1, 2022

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

	December 31, 2021	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	$ 151,795	$ 147,017
Short-term marketable securities	214,458	148,139
Related party receivable from collaboration	4,945	333
Related party contract asset	—	6,100
Prepaid expenses and other current assets	8,082	6,837
Total current assets	379,280	308,426
Property and equipment, net	10,071	14,526
Operating lease right-of-use asset	4,045	—
Restricted cash	1,499	1,499
Other non-current assets	7,492	4,592
Total assets	$ 402,387	$ 329,043
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 5,246	$ 9,663
Accrued liabilities	33,258	29,945
Operating lease liability, current	5,077	—
Deferred rent, current	—	2,975
Contract liabilities	17,774	—
Total current liabilities	61,355	42,583
Operating lease liability, non-current	5,385	—
Deferred rent, non-current	—	6,417
Total liabilities	66,740	49,000
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, 2021 and 2020, respectively	—	—
Common stock, $0.001 par value; 400,000,000 shares authorized; 77,962,722 and 70,585,364 shares issued and outstanding as of December 31, 2021 and 2020, respectively	78	71
Additional paid-in capital	754,664	578,599
Accumulated other comprehensive (loss) income	(129)	4
Accumulated deficit	(418,966)	(298,631)
Total stockholders' equity	335,647	280,043
Total liabilities and stockholders' equity	$ 402,387	$ 329,043

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,		
	2021	**2020**	**2019**
Related party revenue	$ 77,882	$ 87,368	$ 103,544
Operating expenses:			
Research and development	161,712	163,972	129,253
General and administrative	36,865	27,229	23,631
Total operating expenses	198,577	191,201	152,884
Loss from operations	(120,695)	(103,833)	(49,340)
Interest income, net	420	1,939	6,692
Other expense, net	(60)	(593)	(147)
Net loss	$ (120,335)	$ (102,487)	$ (42,795)
Net loss per share, basic and diluted	$ (1.56)	$ (1.50)	$ (0.85)
Weighted average shares used to compute net loss per share, basic and diluted	77,085,405	68,475,378	50,297,524

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In thousands)

	Year Ended December 31,		
	2021	**2020**	**2019**
Net loss	$ (120,335)	$ (102,487)	$ (42,795)
Other comprehensive (loss) income, net of tax:			
Net unrealized (loss) income on available-for-sale marketable securities	(133)	(21)	292
Total comprehensive loss	$ (120,468)	$ (102,508)	$ (42,503)

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 Income (Loss)	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
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 under 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
Comprehensive income	—	—	—	—	—	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 under 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
Comprehensive loss	—	—	—	—	—	(21)	—	(21)
Net loss	—	—	—	—	—	—	(102,487)	(102,487)
Balance at December 31, 2020	—	$ —	70,583	$ 71	$ 578,599	$ 4	$ (298,631)	$ 280,043
Issuance of common stock under offering, net of issuance costs	—	—	5,324	5	134,575	—	—	134,580
Issuance of common stock upon exercise of stock options	—	—	1,845	2	12,360	—	—	12,362
Issuance of common stock under employee stock purchase plan	—	—	193	—	2,519	—	—	2,519
Issuance of common stock under Open Market Agreement, net of issuance costs	—	—	7	—	196	—	—	196
Issuance of common stock to participants in 401(k) plan	—	—	4	—	125	—	—	125
Vesting of common stock from early exercises	—	—	6	—	48	—	—	48
Stock-based compensation expense	—	—	—	—	26,242	—	—	26,242
Comprehensive loss	—	—	—	—	—	(133)	—	(133)
Net loss	—	—	—	—	—	—	(120,335)	(120,335)
Balance at December 31, 2021	—	$ —	77,962	$ 78	$ 754,664	$ (129)	$ (418,966)	$ 335,647

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Year Ended December 31,		
	2021	**2020**	**2019**
Cash flows from operating activities			
Net loss	$ (120,335)	$ (102,487)	$ (42,795)
Adjustments to reconcile net loss to net cash used in operating activities:			
Stock-based compensation expense	26,242	15,651	12,862
Reduction in related party contract asset due to Amended Collaboration Agreement with Merck	4,600	—	—
Depreciation	6,089	6,555	7,605
Amortization of premium (discount) on marketable securities	3,514	(128)	(1,123)
Noncash lease expense	1,810	—	—
Other non-cash expenses	643	613	217
Changes in operating assets and liabilities:			
Related party receivable from collaboration	(4,612)	4,873	(1,537)
Related party contract asset	1,500	(6,100)	—
Prepaid expenses and other assets	(4,145)	(1,864)	(1,988)
Accounts payable	(4,417)	910	3,642
Accrued and other liabilities	2,893	6,182	8,877
Operating lease liability	(4,785)	—	—
Deferred rent	—	(2,829)	(2,683)
Contract liabilities	17,774	(4,872)	(24,251)
Net cash used in operating activities	(73,229)	(83,496)	(41,174)
Cash flows from investing activities			
Purchase of marketable securities	(293,466)	(177,655)	(134,306)
Proceeds from maturities of marketable securities	223,500	128,536	186,518
Purchase of property and equipment	(1,684)	(1,879)	(3,489)
Net cash (used in) provided by investing activities	(71,650)	(50,998)	48,723
Cash flows from financing activities			
Proceeds from follow on offering, net	134,580	—	—
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	196	21,943	—
Proceeds from exercise of stock options	12,362	11,838	3,575
Proceeds from employee stock purchase plan	2,519	2,370	1,270
Deferred offering costs paid	—	(613)	—
Net cash provided by financing activities	149,657	35,538	180,751
Net increase (decrease) in cash and cash equivalents	4,778	(98,956)	188,300
Cash, cash equivalents and restricted cash at beginning of period	148,516	247,472	59,172
Cash, cash equivalents and restricted cash at end of period	$ 153,294	$ 148,516	$ 247,472
Non-cash investing and financing activities:			
Right of use asset acquired under operating lease on the adoption of ASC 842	$ 5,855	$ —	$ —
Net exercise of convertible preferred stock warrant to Series A preferred stock	—	—	198
Vesting of common stock from early exercises	48	524	993
Property and equipment purchases accrued and not yet paid	—	20	305
Deferred offering costs accrued and not yet paid	—	228	—

See accompanying notes to consolidated financial statements.

NGM BIOPHARMACEUTICALS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Organization and Description of Business

NGM Biopharmaceuticals, Inc. and its wholly-owned subsidiary, NGM Biopharmaceuticals Australia Pty Ltd., collectively referred to as the Company, is focused on discovering and developing novel, potentially life-changing medicines based on scientific understanding of key biological pathways underlying cancer, retinal diseases and liver and metabolic diseases. The Company's robust portfolio of product candidates range from early discovery to Phase 2b development and include NGM707, NGM831, NGM438, NGM120, NGM621, aldafermin and MK-3655. 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.

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 NGM Biopharmaceuticals, Inc. and its wholly-owned foreign subsidiary in Australia, NGM Biopharmaceuticals Australia Pty Ltd. 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 reported amounts of assets, liabilities, revenues and expenses. Specific accounts that require management estimates include, but are not limited to, the valuation of common stock and the associated stock-based compensation expense, contract manufacturing accruals, clinical trial accruals and revenue recognition in accordance with Accounting Standards Update, or ASU, 2014-09, Revenue from Contracts with Customers (Topic 606), or ASC 606. 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, and to the extent that there are differences between management's estimates and actual results, the Company's future financial statement presentation, financial condition, results of operations and cash flows may be affected.

Sources and Uses of Liquidity

Since inception, the Company has incurred net losses and negative cash flow from operations. During the years ended December 31, 2021, 2020 and 2019, the Company incurred net losses of $120.3 million, $102.5 million and $42.8 million, respectively. As of December 31, 2021, the Company had an accumulated deficit of $419.0 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.

As of December 31, 2021, the Company had $366.3 million of cash, cash equivalents and short-term marketable securities.

In June 2020, the Company entered into an Open Market Sale Agreement[SM], or the Sales Agreement, with Jefferies LLC. As of December 31, 2021, $127.2 million of the Company's common stock remained available to be sold under the Sales Agreement, subject to conditions specified in the Sales Agreement.

The Company believes 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 of these consolidated financial statements.

To fully implement the Company's business plan and fund its operations, the Company will need to raise significant additional capital through public or private equity or debt offerings (which may include potential net proceeds from future sales, if any, under the Sales Agreement), product 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, 2021 and 2020, 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 income (loss) as a separate component of stockholders' equity. Interest income, 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, 2021, 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 within twelve months from the date of these consolidated financial statements.

Concentration of Credit and Other Risks

Cash, cash equivalents and marketable securities from the Company's available-for-sale and marketable securities 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 United States, or 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 amended and restated research collaboration, product development and license agreement, or the Amended Collaboration Agreement, with Merck Sharp & Dohme Corp., or 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, 2021, 2020 and 2019.

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

Effective January 1, 2021, the Company adopted Accounting Standards Update, or ASU, 2016-02, Leases (Topic 842), referred to as ASC 842. Under ASC 842, the Company determines if an arrangement is a lease at inception. Lease assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the Company's obligation to make lease payments arising from the lease. Lease liabilities are measured at the lease commencement date as the present value of future minimum lease payments over the term of the lease. Lease assets are measured as the lease liability plus initial direct costs and prepaid lease payments less lease incentives. In measuring the present value of the future minimum lease payments, the Company generally uses its incremental borrowing rate. The lease term is the non-cancelable period of the lease and includes options to extend or terminate the lease when it is reasonably certain that an option will be exercised. Leases with terms of 12 months or less are not recorded on the Company's balance sheet. Lease expense is recognized on a straight-line basis over the lease terms, or in some cases, the useful life of the underlying asset. The Company accounts for the lease and non-lease components as a single lease component. The Company’s lease agreement for its laboratory and office facilities is classified as an operating 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, 2021 and 2020, 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

Under ASC 606, the Company estimates each 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. The unconstrained variable consideration amount included in the transaction price represents an amount for which it is probable that a significant reversal of cumulative revenue recognized will not occur.

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.

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. In situations when a contract includes distinct services that are substantially the same and have the same pattern of transfer to the customer over time, they are recognized as a series of distinct services.

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 unconstrained variable consideration amount included in the transaction price represents an amount for which it is probable that a significant reversal of cumulative revenue recognized will not occur. 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 health 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.

Contract modifications, defined as changes in the scope or price (or both) of a contract that are approved by the parties to the contract, such as a contract amendment, exist when the parties to a contract approve a modification that either creates new, or changes existing, enforceable rights and obligations of the parties to the contract. Depending on facts and circumstances, the Company accounts for a contract modification as one of the following: (i) a separate contract; (ii) a termination of the existing contract and a creation of a new contract; or (iii) a combination of the preceding treatments. A contract modification is accounted for as a separate contract if the scope of the contract increases because of the addition of promised services that are distinct and if the price of the contract increases by an amount of consideration that reflects the Company's standalone selling prices of the additional promised services. When a contract modification is not considered a separate contract and the remaining services are distinct from the services transferred on or before the date of the contract modification, the Company accounts for the contract modification as a termination of the existing contract and a creation of a new contract. When a contract modification is not considered a separate contract and the remaining services are not distinct, the

Company accounts for the contract modification as an add-on to the existing contract and as an adjustment to revenue on a cumulative catch-up basis.

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 accrues estimated costs for its clinical trial activities performed by third parties, including clinical research organizations, or CROs, and other service providers based upon estimates of the proportion of work completed over the life of the individual clinical trial and patient enrollment rates in accordance with associated agreements. The Company's estimates are determined through detailed discussions with internal personnel and its service providers as to the progress of each clinical trial and by reviewing contracts, vendor agreements and purchase orders for previously agreed-upon rates and fees to be paid for such services.

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, Compensation - Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting on January 1, 2019, stock-based compensation expense for nonemployee 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 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 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 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 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 was computed as follows (in thousands, except share and per share amounts):

	Year Ended December 31,		
	2021	2020	2019
Numerator:			
Net loss	$ (120,335)	$ (102,487)	$ (42,795)
Denominator:			
Weighted average number of shares used in calculating net loss per share—basic and diluted	77,085,405	68,475,378	50,297,524
Net loss per share—basic and diluted	$ (1.56)	$ (1.50)	$ (0.85)

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,		
	2021	2020	2019
Options to purchase common stock	10,484,553	10,017,918	10,824,780
Shares committed under ESPP	389,947	291,992	396,682
Total	10,874,500	10,309,910	11,221,462

Segment and Geographical Information

The Company operates in one business segment. Substantially all of the Company's long-lived assets, primarily comprised of property and equipment, are based in the United States. For the years ended December 31, 2021, 2020 and 2019, the Company's revenues were entirely within the United States based upon the location of the Company and Merck.

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.

Recently Adopted Accounting Pronouncements

Under the Jumpstart Our Business Startups Act of 2012, as amended, or the JOBS Act, the Company met the definition of an emerging growth company prior to December 31, 2021 and elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act and, as a result, had not been subject to the same implementation timing for new or revised accounting standards as for other public companies that are not emerging growth companies. Effective December 31, 2021, the Company was no longer an emerging growth company, and as a result, the Company was required to adopt ASC 842 for the fiscal year beginning January 1, 2021 using a modified-retrospective approach under which the Company recognized and measured leases existing at, or entered into after, January 1, 2021.

The Company elected the optional transition approach of not adjusting its comparative period financial statements for the adoption of ASC 842, and as a result, the Company's consolidated balance sheet as of December 31, 2020 was not restated to reflect the adoption of ASC 842. Effective January 1, 2021, the Company recorded a right-of-use, or ROU, asset of $5.9 million (which was net of its deferred rent liability of $9.4 million as of December 31, 2020) and corresponding lease liability of $15.2 million related to the Company's real estate lease. Lease liabilities are measured at the lease commencement date as the present value of future minimum lease payments over the term of the lease. Lease ROU assets are measured as the lease liability plus initial direct costs and prepaid lease payments less lease incentives. In measuring the present value of the future minimum lease payments, the discount rate for the lease is the rate implicit in the lease unless that rate cannot be readily determined. In that case, the lessee is required to use its incremental borrowing rate. In computing its lease liabilities, the Company used its incremental borrowing rate based on information available on the commencement effective date of January 1, 2021 using a company-specific rate in the United States that is fully collateralized and consistent with the lease term for the Company's real estate lease. The lease term is the non-cancelable period of

the Company's real estate lease. The Company does not assume renewals in its determination of the lease term unless the renewals are deemed by management to be reasonably certain at lease inception.

The Company elected the package of practical expedients permitted under the transition guidance associated with ASC 842, which, among other things, allowed the Company to carry forward the historical lease classification of those leases in place as of January 1, 2021. The Company also elected the practical expedient to not separate non-lease components from lease components and instead accounts for them as a single lease component for all classes of underlying assets.

The effect of adopting ASC 842 on the Company's consolidated balance sheet as of January 1, 2021 was as follows (in thousands):

	December 31, 2020 (1)	ASC 842 adjustments	Adjusted balances as of January 1, 2021
Assets			
Operating lease right-of-use asset	$ —	$ 5,855	$ 5,855
Liabilities			
Deferred rent, current	$ 2,975	$ (2,975)	$ —
Operating lease liability, current	—	4,785	4,785
Deferred rent, non-current	6,417	(6,417)	—
Operating lease liability, non-current	—	10,462	10,462
Totals	$ 9,392	$ 5,855	$ 15,247

(1) As reported in the Company's 2020 Annual Report on Form 10-K.

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 addition, ASC 808 precludes an entity from presenting consideration from a transaction in a collaborative arrangement as revenue from contracts with customers if the participant is not a customer for that transaction. The Company adopted ASU 2018-18 effective January 1, 2021, noting no material impact on the Company's 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. The Company adopted ASU 2019-12 effective January 1, 2021, noting no material impact on the Company's results of operations and financial position.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments. The standard amends guidance on reporting credit losses for financial assets held at amortized cost basis, including accounts receivable, investments classified as available for sale, such as the Company's debt securities, and unbilled related party revenue. Estimated credit losses will be recorded as an allowance rather than a write-down. In November 2019, the FASB issued ASU 2019-10, which deferred the effective date for certain ASUs including ASU 2016-13. Given the Company was no longer an emerging growth company as of December 31, 2021, the Company adopted ASU 2016-13 effective January 1, 2021, noting no material impact on the Company's results of operations and financial position.

3. Fair Value Measurements

Cash equivalents and marketable securities are classified as available-for-sale securities and consisted of the following (in thousands):

	Amortized Cost	Gross Unrealized Gain	Gross Unrealized Loss	Fair Value
As of December 31, 2021				
U.S. treasury securities	$ 141,093	$ —	$ (116)	$ 140,977
Money market funds	129,763	—	—	129,763
Corporate and agency bonds	64,997	7	(20)	64,984
Commercial paper	8,497	—	—	8,497
Totals	$ 344,350	$ 7	$ (136)	$ 344,221
Classified as:				
Cash and cash equivalents				$ 129,763
Short-term marketable securities (amortized cost of $214,587)				214,458
Total				$ 344,221

	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

Cash and cash equivalents in the table above excludes cash on deposit with banks of $22.0 million and $9.4 million as of December 31, 2021 and 2020, 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, 2021 and 2020, the Company's marketable securities had remaining contractual maturities of less than one year. As of December 31, 2021, the Company had 21 marketable securities in an unrealized loss position compared to one marketable security in an unrealized loss position as of December 31, 2020. Marketable securities that had been in unrealized loss positions as of December 31, 2021 and 2020 had been in an unrealized loss position for less than twelve 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, 2021	**Level 1**	**Level 2**	**Level 3**	**Total**
Assets:				
U.S. treasury securities	$ 140,977	$ —	$ —	$ 140,977
Money market funds	129,763	—	$ —	129,763
Corporate and agency bonds	—	64,984	—	64,984
Commercial paper	—	8,497	—	8,497
Totals	$ 270,740	$ 73,481	$ —	$ 344,221

	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

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 and agency bond securities, commercial paper and U.S. government agencies and treasury 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, 2021 and 2020.

4. Balance Sheet Components

Cash, Cash Equivalents 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,	
	2021	**2020**
Cash and cash equivalents	$ 151,795	$ 147,017
Restricted cash	1,499	1,499
Total cash, cash equivalents and restricted cash	$ 153,294	$ 148,516

Property and Equipment

Property and equipment consisted of the following (in thousands):

	December 31,	
	2021	2020
Leasehold improvements	$ 25,880	$ 25,880
Laboratory equipment and office furniture	21,916	23,638
Computer equipment	1,225	1,271
Construction-in-progress	18	48
Total property and equipment, gross	49,039	50,837
Less: accumulated depreciation and amortization	(38,968)	(36,311)
Total property and equipment, net	$ 10,071	$ 14,526

Depreciation expense for the years ended December 31, 2021, 2020 and 2019 was approximately $6.1 million, $6.6 million and $7.6 million, respectively.

Accrued Liabilities

Accrued liabilities consisted of the following (in thousands):

	December 31,	
	2021	2020
Clinical trials and research and development costs	$ 12,070	$ 9,316
Personnel-related costs	10,298	8,921
Manufacturing costs	7,773	8,297
Accrued expenses	3,117	3,411
Total accrued liabilities	$ 33,258	$ 29,945

5. Research Collaboration and License Agreements

Merck

In 2015, the Company entered into a research collaboration, product development and license agreement with Merck, which, together with amendments made prior to June 30, 2021, is referred to as the Original 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. Merck owned approximately 16.6% of the Company's outstanding shares as of December 31, 2021.

On June 30, 2021, the Company and Merck entered into an amended and restated research collaboration, product development and license agreement, or the Amended Collaboration Agreement, with a narrower scope than contemplated in the Original Collaboration Agreement, as described in more detail below.

The Original Collaboration Agreement

The Original Collaboration Agreement had 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 exchange for a $20.0 million extension fee payable at each extension, as described in more detail below. Each extension, if and when exercised by Merck, would be considered and would be accounted for as a separate arrangement. Under the Original Collaboration Agreement, in March 2019, Merck exercised its first option to extend the research phase of the collaboration for two additional years through March 16, 2022, agreeing at that time 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 the $20.0 million extension fee that would have otherwise been payable to the Company at that time, 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. Merck’s decision whether or not to exercise its second option to extend the research phase of the collaboration under the Original Collaboration

Agreement was mooted when, on June 30, 2021, Merck and the Company entered into the Amended Collaboration Agreement, as described in more detail below.

Under the terms of Original Collaboration Agreement, the Company determined the scientific direction and areas of therapeutic interest for the collaboration, with input from Merck, and was primarily responsible for the conduct of all research, preclinical and early clinical development activities through human proof-of-concept trials. The Company made the final determinations as to which collaboration compounds to advance into and through initial clinical trials, which collaboration compounds to progress into a human proof-of-concept trial and the design of any such trials, in each case with input from Merck through various governance committees.

Under the terms of the Original Collaboration Agreement, upon completion of a human proof-of-concept trial for a particular collaboration compound, regardless of the results of such trial, Merck had the one-time option to obtain an exclusive, worldwide license, on specified terms, to that collaboration compound, as well as to all other compounds that were directed against the same target and that result in the same effect on such target, or the related compounds, referred to as the Merck license option. For each program that Merck licensed, Merck was required to pay the Company a one-time fee of $20.0 million. Following exercise of a Merck license option, Merck was responsible, at its own cost, for any further development and any commercialization activities for compounds within the applicable program that it licensed, or the licensed compounds, subject to the Company's option on a licensed compound-by-licensed compound basis, prior to Merck initiating any Phase 3 clinical trial of such licensed compound, to enter into a worldwide cost and profit share with Merck, or the cost and profit share option, and to co-detail the applicable licensed compound in the United States. If the Company elected to exercise its cost and profit share option for a particular licensed compound, Merck agreed to advance to the Company and/or assume up to 25% of the Company's share of the global development costs for such licensed compound, subject to an aggregate cap over the course of the collaboration. All such amounts advanced or assumed by Merck accrued interest and would be recouped by Merck in full out of the Company's share of any profits resulting from sales of the licensed compound for which the Company elected to exercise its cost and profit share option before the Company was entitled to receive any of those profits. If the Company did not elect to exercise its cost and profit share option for a particular licensed compound, the Company was eligible to receive (i) 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, the European Union, or EU, and Japan; (ii) commercial milestone payments of up to $125.0 million; and (iii) royalties at ascending low-double digit to mid-teen percentage rates, depending on the level of net sales Merck achieves worldwide for such licensed compound.

Under the terms of the Original 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 researched or developed during 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 did not exercise its Merck license option to a collaboration compound the Company advanced through a human proof-of-concept study that was directed to any such target, Merck's research license for its own small molecule program with respect to such target would become non-exclusive, but it would retain an exclusive license to any small molecule compounds that it had, as of that time, identified and developed. Merck had sole responsibility for research and development of any of these small molecule compounds, at its own cost. The Company was eligible to receive milestone and royalty payments on small molecule compounds that were developed by Merck under such a license from the Company, in some cases at the same rates as those the Company was eligible to receive from Merck for a program that Merck licensed and that originated 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 did not have the option to enter into a cost and profit share with respect to, or the option to co-detail, those small molecule compounds.

Under the terms of the Original Collaboration Agreement, during the three-month period before the end of the research phase as defined in the Original Collaboration Agreement, Merck had the right to review the Company's then-existing programs and to elect to designate one or more such programs and require the Company to continue to conduct research and development on such Merck-designated programs for up to three years, a period referred to as the Original Collaboration Agreement tail period. Merck would pay all of the Company's internal and external costs for its work on such Merck-designated programs during the Original Collaboration Agreement tail period, up to certain funding caps that decreased over the Original Collaboration Agreement tail period based on a specified percentage of certain funding actually provided to the Company by Merck during the last 12 months of the research phase as defined in the Original Collaboration Agreement. Merck also had 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 Original Collaboration Agreement tail period after a specified notice period. If Merck terminated the Original Collaboration Agreement tail period, it had the right to elect to transition to itself or a third-party partner, at its own cost, any clinical trials that were then being conducted in such Merck-designated programs. If the Company completed a human proof-of-concept trial in one of such Merck-designated programs during the Original Collaboration Agreement tail period or if Merck or its third-party partner completed a human proof-of-concept trial of a collaboration compound in one of such Merck-designated programs during or after the Original Collaboration Agreement tail period, then Merck would have the same one-time Merck license option to obtain an exclusive, worldwide license, on specified terms, to that collaboration compound, as well as to all its related compounds. Merck would lose its Merck license option rights at the end of the Original Collaboration Agreement tail period with respect to all programs for which no collaboration compound had completed a human proof-of-concept trial by such time, except for Merck-designated programs that Merck was continuing to use commercially reasonable efforts to research and develop.

The Company evaluated the Original Collaboration Agreement under ASC 606. The Company identified the following promised goods or services at the inception of the Original Collaboration Agreement: (i) a license to the Company's growth differentiation factor 15, or GDF15, agonist program; (ii) a license to pursue research and development and commercialization of small molecule compounds; (iii) the 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) Merck license options to obtain licenses to collaboration compounds and related compounds after proof-of-concept trials. The Company determined that the GDF15 agonist program license and small molecule program license were not distinct from the research and development services, resulting in these items being combined into a single performance obligation.

The Company also considered whether such 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 Company concluded that such options did not give rise to material rights, were not performance obligations in the Original Collaboration Agreement and, if and when exercised, would be accounted for as separate arrangements under ASC 606.

Additionally, if a separate arrangement were created by the exercise of such an option, such amounts would 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 resulted 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 Original Collaboration Agreement was comprised of the upfront cash licensing fee of $94.0 million and ongoing research and development reimbursements.

Any fees associated with such options, including associated upfront fees, follow on funding fees and milestones, were not included in the transaction price related to the Original Collaboration Agreement as they were associated with options that were not material rights and, thus, were not performance obligations within the Original Collaboration Agreement. For example, in November 2018, Merck exercised its option for a license to further research and develop MK-3655, an agonistic antibody discovered by the Company that selectively activates fibroblast growth factor receptor 1c-beta-klotho, or FGFR1c/KLB, and other FGFR1c/KLB agonists and paid the Company $20.0 million. The $20.0 million license fee for MK-3655 was not included in the transaction price related to the Original Collaboration Agreement 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 therefore not made an election as to whether it will participate in the cost and profit share or receive milestone and royalty payments with respect to MK-3655.

The transaction price associated with the initial five-year term of the Original 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 Original Collaboration Agreement. No milestones or other forms of consideration were included in the transaction price related to the Original Collaboration Agreement as those amounts were contingent upon Merck exercising an option for licenses on collaboration compounds and would, therefore, be pursuant to separate arrangements and not part of the Original Agreement estimated transaction price. As there was only one performance obligation in the Original Collaboration Agreement, the transaction price was allocated entirely to that performance obligation.

At the end of the initial five-year term of the Original 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 Original 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 two-year performance obligation to provide distinct research and development services was created on March 17, 2020. The transaction price of $170.0 million for this two-year performance obligation under the Original Collaboration Agreement consisted of the potential funding of amounts of up to $75.0 million per year plus the additional funding amount of $20.0 million to be made during 2021 through to the first quarter of 2022 if the Company exceeded the $75.0 million funding cap. The Company used 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 measured actual costs incurred relative to budgeted costs to fulfill this distinct two-year performance obligation. These costs consisted of Company employee full-time equivalent hours plus allowable external (third-party) costs incurred. Revenue was recognized based on actual costs incurred as a percentage of total budgeted costs as the Company completed its performance obligation applied to the transaction price. The Company re-evaluated the estimate of expected costs to satisfy the performance obligation each reporting period and made adjustments for any significant changes. In addition, the Company also considered any necessary adjustments in an effort to ensure that the transaction price was within the range of potential funding amounts as described above. As such, management applied considerable judgment in estimating expected costs as such costs were key inputs when applying the cost-based input method. As the Company's estimated measure of progress was updated at each reporting period and revenue was 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 had 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 under the Original Collaboration Agreement included 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 was 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 of $4.6 million at March 31, 2021.

The Amended Collaboration Agreement.

Under the Original Collaboration Agreement, 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. After such discussions, on June 30, 2021, the Company and Merck entered into the Amended Collaboration Agreement. Pursuant to the Amended Collaboration Agreement, the prior two-year extension of the research phase under the Original Agreement was deemed to end on March 31, 2021, while a new three-year research phase commenced on April 1, 2021. Under the Original Collaboration Agreement, all of the Company's research and development programs, both those existing at the time the Company entered into the Original Collaboration Agreement and those the Company worked on during the research phase of the collaboration, other than aldafermin, were included within the scope of the collaboration. Under the Amended Collaboration Agreement, the scope of the collaboration and the resulting programs for which Merck has the Merck license option was narrowed. The collaboration as conducted under the Amended Collaboration Agreement, or the continuing collaboration, is focused primarily on the identification, research and development of collaboration compounds directed to targets of interest to Merck in the fields of ophthalmology and cardiovascular or metabolic, or CVM, disease, including heart failure, as well as certain laboratory testing and other activities on compounds that are directed to one of up to two undisclosed targets outside of the fields of ophthalmology and CVM disease, referred to as the lab programs. The ophthalmology compounds in the continuing collaboration include NGM621, an ophthalmology compound in a Phase 2 clinical trial, and its related compounds, and compounds directed against two other undisclosed ophthalmology targets and their related compounds. Collaboration compounds that remain within the scope of the continuing collaboration under the Amended Collaboration Agreement are referred to as continuing collaboration compounds. Given the narrowed research scope under the Amended Collaboration Agreement, the Company has the right, in its sole discretion, to independently research, develop and commercialize the collaboration compounds known as NGM120, NGM707, NGM831 and NGM438, their related compounds and all other preclinical and research assets that the Company researched or developed under the Original Collaboration Agreement but that are not included within the research and development scope of the continuing collaboration, which are referred to as the released NGM compounds. Merck retained the right to receive royalties at low single-digit rates on the sales of any released NGM compounds that receive regulatory approval and, if the Company decides during a certain time period to engage in a formal partnering process for a released NGM compound or negotiations regarding a license or asset sale of a released NGM compound, the Company is obligated to notify Merck, provide Merck with certain information and engage in good faith, non-exclusive negotiations with respect to such released NGM compound with Merck at Merck's request.

Under the Amended Collaboration Agreement, Merck continues to have a Merck license option, as it did under the Original Agreement, to each continuing collaboration compound that is identified, researched and developed under the Amended Collaboration Agreement and reaches the specified option exercise point for such continuing collaboration compound as described below, and to its related compounds (each such continuing collaboration compound and its related compounds are referred to generally as a continuing program). In addition, under the terms of the Amended Collaboration Agreement, new CVM-related programs may be added to the continuing collaboration if recommended by the Company and selected by Merck, and Merck would have a Merck license option to such CVM-related continuing program. Merck has a one-time right to exercise its Merck license option, during the research phase or a tail period following such research phase, as applicable, for any continuing collaboration compound on a continuing program-by-continuing program basis when the Company or Merck achieves the specified Merck license option exercise point. The Merck license option exercise point for collaboration compounds under the Original Collaboration Agreement was the completion of a human proof-of-concept trial. This generally continues to be the Merck license option exercise point under the Amended Collaboration Agreement for continuing collaboration compounds that are directed to ophthalmology targets, including NGM621 and its related compounds and all of the continuing collaboration compounds from two other ophthalmology continuing programs directed against undisclosed ophthalmology targets and their related compounds (including NGM621 and its related compounds, collectively referred to as the continuing ophthalmology collaboration compounds). Upon the completion of the ongoing Phase 2 NGM621 CATALINA clinical trial, Merck will have an additional one-time option to obtain an exclusive, worldwide license to all of the continuing ophthalmology collaboration compounds together, referred to as the ophthalmology bundle option. If Merck does not exercise this one-time ophthalmology bundle option for all continuing ophthalmology collaboration compounds, it may nevertheless exercise its regular Merck license option with respect to NGM621 and its related compounds at such time, and it may also exercise its regular Merck license option for the continuing ophthalmology collaboration compounds from each of the other two programs if a continuing ophthalmology collaboration compound from such continuing program completes a human proof-of-concept trial. Unlike the Original Collaboration Agreement, the Merck license option exercise point for a continuing collaboration compound from the CVM-related continuing programs or the lab programs will be the designation by Merck of such continuing collaboration compound as a research program development candidate that Merck intends to progress into preclinical development.

As was the case under the Original Collaboration Agreement, under the Amended Collaboration Agreement, if Merck exercises a Merck license option and obtains the relevant exclusive, worldwide license for a continuing collaboration compound and its related compounds, Merck will pay an option exercise fee to the Company and will be responsible, at its own cost, for any further development and commercialization activities for continuing collaboration compounds within that licensed continuing program. In such case, the Company will have the option to receive milestones and royalty payments or, in certain cases, to co-fund development and participate in a global cost and profit share arrangement of up to 50%, with an additional option to co-detail any such licensed continuing collaboration compound in the United States under the same terms as set forth in the Original Collaboration Agreement. Except for the ophthalmology bundle option, the amount of the option exercise fees for continuing ophthalmology collaboration compounds upon completion of a human proof-of-concept trial remains the same under the Amended Collaboration Agreement as under the Original Collaboration Agreement. If Merck exercises the ophthalmology bundle option, it will pay the Company either $40.0 million or $45.0 million as the Merck license option exercise fee, depending upon the stage of development of one of the two earlier stage ophthalmology programs that is included in the ophthalmology bundle option. Under the Amended Collaboration Agreement, if Merck exercises the Merck license option for a continuing collaboration compound from a CVM-related continuing program or a lab program, Merck will pay the Company a $6.0 million option exercise fee at the time of selection to progress such licensed continuing collaboration compound or any of its related compounds into preclinical development and an additional $10.0 million milestone payment if such continuing collaboration compounds or one of its related compounds subsequently completes a human proof-of-concept trial.

Under the Amended Collaboration Agreement, the parties' rights and obligations with respect to MK-3655 and related FGFR1c/KLB agonists for which Merck exercised its Merck license option in November 2018 did not change.

Under the Amended Collaboration Agreement, Merck will provide up to $86.0 million in research funding for the four calendar quarters ending March 31, 2022, which includes the remaining $16.0 million of the up to $20.0 million in additional payments Merck agreed to pay as part of exercising its first option to extend the research phase of the collaboration under the Original Collaboration Agreement for two years through March 16, 2022. The Company is obligated to use commercially reasonable efforts to expend $35.0 million of such $86.0 million in funding during the same time frame on the ophthalmology, CVM-related and lab continuing programs. The Company is permitted to use the remainder of the $86.0 million in research funding provided by Merck during such

time frame to advance the released NGM compounds. During the remaining two years of the research phase after March 2022, Merck will provide up to a total of $20.0 million in research funding for the ophthalmology, CVM-related and lab continuing programs. Merck will also fund certain research and development costs related to NGM621, subject to certain limitations, until the earlier of the remaining two years of the research phase after March 2022 or until Merck exercises, or decides not to exercise, its license option with respect to NGM621 alone or bundled with the other continuing ophthalmology compounds. After March 2022, the Company, using its own funding, is required to use commercially reasonable efforts to research and develop a specific product candidate directed to a specific ophthalmology target to be ready for starting investigational new drug application-, or IND-, enabling studies by March 31, 2023. If Merck exercises its regular Merck license option with respect to NGM621 or the ophthalmology bundle option for all of the continuing ophthalmology collaboration compounds upon completion of the ongoing Phase 2 CATALINA clinical trial of NGM621 and pays the applicable option exercise fee to the Company, then the Company will be obligated to reinvest $5.0 million or up to $15.0 million, respectively, of such option fee to fund research on the ophthalmology and CVM-related continuing programs.

Under the Amended Collaboration Agreement, the research phase for the ophthalmology continuing programs will end no later than March 31, 2024. The research phase for the CVM-related continuing programs will also continue until March 31, 2024, unless the parties mutually agree to extend the research phase to March 31, 2026, in which case Merck will provide up to a total of $20.0 million in research funding during those additional two years. The research phase for the lab programs will end no later than December 31, 2022.

As under the Original Collaboration Agreement, Merck has the right under the Amended Collaboration Agreement to review the then-ongoing continuing programs in the three-month period before the end of applicable research phase and to elect to designate one or more continuing programs for which research and development would continue to be conducted, until the applicable Merck license option exercise point is reached, for up to three years after the end of such research phase, with the possibility of extension if the Company is conducting ongoing ophthalmology clinical trials, if Merck is using commercially reasonable efforts to progress one or more ophthalmology continuing programs or if Merck determines to continue progressing a CVM-related continuing program or lab program toward the nomination of a research program development candidate, and any such extension is referred to as an Amended Collaboration Agreement tail period. Under the Amended Collaboration Agreement, the Amended Collaboration Agreement tail period, if any, for the ophthalmology continuing programs would be separate from the Amended Collaboration Agreement tail period, if any, for the CVM-related continuing programs or any lab program, and Merck would be primarily responsible for performing all research and development activities, itself or through third-party contractors, during the Amended Collaboration Agreement tail period, if any, for the CVM-related continuing programs or any lab program.

The Company concluded that the Amended Collaboration Agreement is a separate arrangement containing a three-year performance obligation to provide distinct research and development services in accordance with ASC 606. The total transaction price under the Amended Collaboration Agreement is $124.7 million and represents the sum of potential funding amounts, including $86.0 million in research funding for the four calendar quarters ending March 31, 2022, $20.0 million in research funding for the ophthalmology and CVM-related continuing programs during the remaining two years of the research phase after March 2022 and $18.7 million in estimated NGM621 reimbursable expenses also during the remaining two years of the research phase after March 2022. The Company will continue to re-evaluate the transaction price as uncertain events are resolved or other changes in circumstances occur. The Company continues performing a series of research and development services in the area of both the continuing collaboration compounds and the released NGM compounds and has one performance obligation across all continuing programs. The Company will continue to use the cost-based input method to calculate the amount of revenue to recognize as services are being rendered from April 1, 2021 through March 31, 2024.

The Company considered whether the Merck license option and the ophthalmology bundle option 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 Company concluded that such options did not give rise to material rights, were not performance obligations in the Amended Collaboration Agreement and, if and when exercised, would be accounted for as separate arrangements under ASC 606.

If Merck exercises its regular Merck license option for NGM621 or the ophthalmology bundle option for all of the continuing ophthalmology collaboration compounds upon completion of the Phase 2 CATALINA clinical trial and pays the applicable Merck license option exercise fee to the Company, this would not result in a modification of the contract as total contract consideration and the Company's performance obligation under the Amended Collaboration Agreement will not change.

As of March 31, 2021, the Company had a contract asset of $4.6 million under the prior two-year extension of the research phase under the Original Collaboration Agreement, which, under the Amended Collaboration Agreement, was no longer billable to Merck at any point and therefore was recorded as a reduction in both the transaction price under the Original Collaboration Agreement and revenue on June 30, 2021.

A breakout of the milestone payments in connection with the potential achievement of certain clinical development events for each of the first three indications 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
Upon first completion of a proof-of-concept trial for a CVM-related research program development candidate	$ 10,000	$ —	$ —
Upon first completion of a proof-of-concept trial for a certain research development candidate for a lab program	$ 10,000	$ —	$ —

A breakout of the aggregate milestone payments in connection with the potential achievement of both acceptance of an application for and receipt of regulatory approval for each of the first 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 Related Party Revenue

The Company recognized revenue from its collaboration and license agreements as follows (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Related party revenue	$ 77,882	$ 87,368	$ 103,544

For the year ended December 31, 2021, the Company recognized collaboration and license revenue of $77.9 million primarily related to reimbursable research and development activities associated with the performance obligation for the two-year extension period through March 31, 2021 under the Original Collaboration Agreement and from April 1, 2021 through December 31, 2021 under the Amended Collaboration Agreement, all of which were recognized using the cost-based input model.

For the year ended December 31, 2020, the Company recognized collaboration and license revenue under the Original 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 prior two-year extension period under the Original Collaboration Agreement, 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 Original 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.

Related Party Contract Assets and Liabilities

Amounts recognized as revenue prior to the Company having an unconditional right (or 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. As of December 31, 2021, the Company did not have a related party contract asset. As of December 31, 2020, the Company had a related party contract asset of $6.1 million.

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. As of December 31, 2021, the Company had a contract liability of $17.8 million. The Company did not have a contract liability as of December 31, 2020.

6. Commitments and Contingencies

Leases

Operating Leases

In December 2015, the Company entered into an operating lease agreement, or the 333 Oyster Point lease agreement, for its corporate office space and laboratory facility at 333 Oyster Point Blvd., South San Francisco, California, or the 333 Oyster Point facility, for approximately 122,000 square feet that expires in December 2023. The 333 Oyster Point lease agreement 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. In 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 agreement, or the 630 Gateway lease agreement, 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 630 Gateway lease agreement to Merck, as part of the Company's relocation to 333 Oyster Point facility. The 630 Gateway lease agreement expired in November 2020. Following expiration of the 630 Gateway lease agreement, the Company retains the obligation to indemnify the landlord and Merck under certain limited circumstances, but has no further payment obligations.

As of December 31, 2021, the weighted-average remaining lease term for the 333 Oyster Point lease agreement was two years and the weighted-average discount rate used to determine the Company's operating lease liability was 2.85%. Cash paid for amounts included in the measurement of the lease liabilities were $5.1 million for the year ended December 31, 2021.

During the year ended December 31, 2021, the components of lease costs, which were included in general and administrative expenses on the Company's consolidated statements of operations, were as follows (in thousands):

	Year Ended December 31, 2021
Operating lease costs	$ 2,166
Variable lease costs (1)	1,235
Total lease costs	$ 3,401

(1) Variable lease costs include certain additional charges for operating costs, including insurance, maintenance, taxes and other costs incurred, which are billed based on both usage and as a percentage of the Company's share of total square footage.

As of December 31, 2021, the maturities of the Company's operating lease liabilities and future minimum lease payments were as follows (in thousands):

Year Ending December 31,		
2022	$	5,294
2023		5,455
Total undiscounted lease payments		10,749
Less: present value adjustment		(287)
Present value of lease liabilities	$	10,462

Prior to the Company's adoption of the new lease accounting standard ASC 846 on January 1, 2021, the maturity schedule of future minimum lease payments under the Company's operating lease agreement as of December 31, 2020 was as follows:

Year Ending December 31,		
2021	$	5,141
2022		5,294
2023		5,455
Total	$	15,890

Rent expense for the 333 Oyster Point facility was approximately of $2.2 million for the years ended December 31, 2020 and 2019, respectively, under the previous lease accounting standard ASC 840.

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, 2021, the Company does not have any shares of preferred stock issued or outstanding.

Common Stock

Public Offering of Common Stock

In January 2021, the Company sold 5,324,074 shares of its common stock through an underwritten public offering at a price to the public of $27.00 per share for aggregate net proceeds to the Company of $134.6 million, after deducting underwriting discounts and commissions and other offering expenses paid by the Company. The offering closed on January 8, 2021.

As of December 31, 2021 and 2020, the Company had 77,962,722 and 70,585,364 shares of common stock outstanding, respectively, which included shares subject to repurchase of 42 and 6,508, 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,	
	2021	2020
Reserve balance for Sales Agreement	14,182,900	14,190,300
Common stock options outstanding	10,484,553	10,017,918
Common stock options available for grant	6,698,538	6,186,497
ESPP shares available for purchase	506,978	700,074
401(k) matching plan	17,813	21,930
Total	31,890,782	31,116,719

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 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 $21.3 million, after deducting $0.7 million in sales commissions. During the year ended December 31, 2021, 7,400 shares of the Company's common stock were sold pursuant to the Sales Agreement. As of December 31, 2021, $127.2 million of the Company’s common stock remained available to be sold under the Sales Agreement, subject to conditions specified in the Sales Agreement.

Equity Incentive Plan

In 2018, the Company adopted the 2018 Equity Incentive Plan, or the 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. 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. As of December 31, 2021, 17,183,091 shares of common stock had been authorized for issuance under the 2018 Plan and the Company's 2008 Equity Incentive Plan which expired in 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.

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 Company 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. Since the beginning of March 2021, the Company has not granted any options under the 2018 Plan that can be early exercised prior to vesting.

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 the right 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 ESPP is considered a compensatory plan and the Company has recorded stock-based compensation expense of $1.6 million, $1.2 million and $1.0 million for the years ended December 31, 2021, 2020 and 2019, respectively. As of December 31, 2021, 493,022 shares of common stock had been purchased under the ESPP.

Stock Option Activity

A summary of the activity under the 2008 Plan and the 2018 Plan is as follows:

	Outstanding Options			
	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (In Years)	Aggregate Intrinsic Value (In Thousands)
Balances at December 31, 2020	10,017,918	$ 10.52	6.45	$ 198,097
Options granted	2,924,383	29.42		
Options exercised	(1,845,276)	6.70		
Options cancelled	(612,472)	22.03		
Balances at December 31, 2021	10,484,553	$ 15.79	6.68	$ 52,349
Vested and expected to vest at December 31, 2021	10,183,536	$ 15.55	6.62	$ 52,221
Exercisable at December 31, 2021	8,504,265	$ 12.72	6.08	$ 52,279

The aggregate intrinsic values of options outstanding, vested and expected to vest, and exercisable were calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock.

Employee Stock-Based Compensation Expense

Employee and director stock-based compensation expense is calculated based on awards previously granted to employees and directors that are ultimately expected to vest and has been reduced for estimated forfeitures.

Employee and director stock-based compensation expense was allocated as follows (in thousands):

	Year Ended December 31,		
	2021	2020	2019
Research and development	$ 13,983	$ 8,145	$ 7,145
General and administrative	11,971	7,312	5,584
Total stock-based compensation expense	$ 25,954	$ 15,457	$ 12,729

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, 2021, 2020 and 2019 was $18.57, $10.86 and $8.00 per share, respectively. The intrinsic value of stock options exercised was $34.2 million, $40.9 million and $10.2 million for the years ended December 31, 2021, 2020 and 2019, respectively. Due to the Company's net operating losses, the Company did not realize any tax benefits from stock-based payment arrangements for the years ended December 31, 2021, 2020 and 2019.

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,		
	2021	**2020**	**2019**
Volatility	72 %	68 %	65 %
Expected term (years)	5.98	6.23	6.18
Risk-free interest rate	0.95 %	1.04 %	2.25 %
Expected dividend yield	—	—	—

As of December 31, 2021, total compensation cost not yet recognized related to unvested stock options granted to employees and directors was $48.3 million, which is expected to be recognized over a weighted-average period of 2.9 years.

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,		
	2021	**2020**	**2019**
Volatility	72 %	74 %	59 %
Expected term (years)	1.27	1.17	1.23
Risk-free interest rate	0.27 %	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, 2021 and 2020, the Company had reserved 17,813 and 21,930 shares of common stock for issuance pursuant to the 401(k) Matching Plan, respectively. Matching contributions of 4,117, 6,344 and 8,477 shares, or $125,000, $119,000 and $98,000 were issued for the years ended December 31, 2021, 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,		
	2021	2020	2019
Domestic	$ (120,858)	$ (102,209)	$ (34,634)
Foreign	523	(278)	(8,161)
Total	$ (120,335)	$ (102,487)	$ (42,795)

A reconciliation of the statutory U.S. federal rate to the Company's effective tax rate is as follows:

	Year Ended December 31,		
	2021	2020	2019
U.S. federal tax at statutory rate	21.0 %	21.0 %	21.0 %
Foreign tax rate differential	0.0	—	1.7
State, net of federal benefit	—	(0.1)	—
Stock-based compensation	1.3	3.8	0.2
Change in valuation allowance	(21.8)	(25.0)	(23.2)
Other	(0.5)	0.3	0.2
Total	0.0 %	0.0 %	0.0 %

The components of the net deferred tax assets are as follows (in thousands):

	December 31,	
	2021	2020
Deferred tax assets:		
Net operating loss carryforwards	$ 83,322	$ 60,879
Stock-based compensation	7,579	4,580
Research and development credit	2,918	2,918
ROU asset	2,198	—
Other temporary differences	514	2,079
Total gross deferred tax assets	96,531	70,456
Deferred tax liabilities:		
Depreciation and amortization	(997)	(389)
Lease liability	(850)	—
Non-qualified stock options with 83(b) election	(15)	(15)
Total gross deferred tax liabilities	(1,862)	(404)
Net deferred tax assets before valuation allowance	94,669	70,052
Deferred tax asset valuation allowance	(94,669)	(70,052)
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 $24.6 million and $24.3 million during the years ended December 31, 2021 and 2020, respectively.

As of December 31, 2021, the Company had approximately $342.3 million in federal net operating loss carryforwards to reduce future taxable income. Of this amount, $277.0 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 2018 Tax Act, the utilization of the federal net operating loss carryforwards generated in fiscal year 2019 and onwards is limited to 80% of the federal taxable income. The Company also had approximately $321.5 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, 2021 and 2020. In addition, the Company had approximately $4.0 million in state research and development tax credits for each of the years ended December 31, 2021 and 2020. 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, 2021 and 2020, the Company had foreign net operating loss carryforwards of approximately $21.3 million and $35.8 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,		
	2021	2020	2019
Balance at beginning of year	$ 10,346	$ 3,819	$ 3,819
Additions based on tax positions related to prior year	4,447	314	—
Additions based on tax positions related to current year	11,077	6,213	—
Balance at end of year	$ 25,870	$ 10,346	$ 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, 2021 and 2020, 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, 2020 remain subject to examination.

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, 2021, 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 Securities Exchange Act of 1934, as amended, 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 Securities and Exchange Commission's, or 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, 2021, 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, 2021 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, 2021 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, 2021.

Our independent registered public accounting firm, Ernst & Young LLP, has audited our Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K and have issued an audit report on our internal control over financial reporting as of December 31, 2021 which appears below.

Report of Independent Registered Public Accounting Firm

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

Opinion on Internal Control over Financial Reporting

We have audited NGM Biopharmaceuticals, Inc.'s internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, NGM Biopharmaceuticals, Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets as of December 31, 2021 and 2020, 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, 2021, and the related notes and our report dated March 1, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm

registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

Redwood City, California
March 1, 2022

Item 9B. Other Information.

None.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The 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" to be included in our Proxy Statement for our 2022 Annual Meeting of Stockholders, or the 2022 Proxy Statement. If required, 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" to be included in our 2022 Proxy Statement. The 2022 Proxy Statement will be filed with the Securities and Exchange Commission no later than 120 days after December 31, 2021.

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 2022 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, 2021” in the 2022 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 2022 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. 4—Ratification of Selection of Independent Registered Public Accounting Firm” in the 2022 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	9/28/2019	
4.2	Form of Common Stock Certificate.	S-1	333-227608	4.2	4/1/2019	
4.3	Description of Capital Stock.	10-K	001-38853	4.3	3/17/2020	
10.1*	2008 Equity Incentive Plan, as amended.	S-1	333-227608	10.1	9/28/2018	
10.2*	Form of Stock Option Agreement and Stock Option Grant Notice under the 2008 Equity Incentive Plan.	S-1	333-227608	10.2	9/28/2018	

10.3*	Amended and Restated 2018 Equity Incentive Plan.	S-1	333-227608	10.3	3/25/2019
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	3/25/2019
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	3/25/2019
10.6*	2019 Employee Stock Purchase Plan.	S-1	333-227608	10.6	3/25/2019
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	9/28/2018
10.8*	NGM Biopharmaceuticals, Inc. Non-Employee Director Compensation Policy.	S-1	333-227608	10.8	3/25/2019
10.9*	Forms of Stock Option Agreement and Notice of Grant of Stock Option for Non-employee Directors Under the Amended and Restated 2018 Equity Incentive Plan,	10-Q	001-38853	10.2	8/5/2021
10.10	Sublease Agreement, by and between NGM Biopharmaceuticals, Inc. and AMGEN Inc., dated December 11, 2015.	S-1	333-227608	10.9	9/28/2018
10.11*	Executive Employment Offer Letter, by and between NGM Biopharmaceuticals, Inc. and Jin-Long Chen, Ph.D.	S-1	333-227608	10.11	9/28/2018
10.12*	Executive Employment Agreement, by and between NGM Biopharmaceuticals, Inc. and David Woodhouse, Ph.D.	S-1	333-227608	10.13	3/25/2019
10-13*	Offer Letter Agreement, by and between the Registrant and Hsiao D. Lieu, M.D., dated as of January 16, 2019.	10-Q	001-38853	10.2	5/6/2021
10-14*	Offer Letter Agreement, by and between the Registrant and Valerie L. Pierce, dated as of August 6, 2019, and related information.	10-Q	001-38853	10.3	5/6/2021
10.15*	Offer Letter Agreement, by and between the Registrant and Siobhan Nolan Mangini, dated as of May 20, 2020.	10-Q	001-38853	10.12	8/12/2020
10.16#	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	9/28/2018
10.17#	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	9/28/2018
10.18	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	9/28/2018
10.19**	Amended and Restated Research Collaboration, Product Development and License Agreement, made effective as of June 30, 2021, by and between NGM Biopharmaceuticals, Inc. and Merck Sharp & Dohme Corp.	10-Q	001-38853	10.1	8/5/2021

10.20#	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	4/1/2019	
10.21**	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.	10-K	001-38853	10.17	3/15/2020	
10.22**	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.	10-K	001-38853	10.18	3/15/2020	
10.23**	Amendment No. 9 on November 3, 2021 to Multi-Product Licence Agreement by and between NGM Biopharmaceuticals, Inc. and Lonza Sales AG, dated as of October 31, 2014.					X
10.24	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	3/25/2019	
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
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)	X

* Indicates management contract or compensatory plan or arrangement.

** Certain confidential information contained in this exhibit has been omitted because it is both not material and is of the type that the Registrant treats as private or confidential.

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 1, 2022

By: /s/ David J. Woodhouse
David J. Woodhouse, Ph.D.
Chief Executive Officer and Director

Date: March 1, 2022

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 1, 2022
/s/ Siobhan Nolan Mangini Siobhan Nolan Mangini	Chief Financial Officer *(Principal Financial and Accounting Officer)*	March 1, 2022
/s/ Bill Rieflin William J. Rieflin	Executive Chairman and Director	March 1, 2022
/s/ Jin-Long Chen Jin-Long Chen, Ph.D.	Chief Scientific Officer and Director	March 1, 2022
/s/ David V. Goeddel, Ph.D. David V. Goeddel, Ph.D.	Director	March 1, 2022
s/ Shelly D. Guyer Shelly D. Guyer	Director	March 1, 2022
s/ Carole Ho Carole Ho, MD	Director	March 1, 2022
/s/ Suzanne Hooper Suzanne Sawochka Hooper	Director	March 1, 2022
/s/ Mark Leschly Mark Leschly	Director	March 1, 2022
/s/ Roger M. Perlmutter, M.D. Roger M. Perlmutter, M.D.	Director	March 1, 2022

Exhibit 10.23

[*] = 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

AMENDMENT No. 9

To the

MULTI-PRODUCT LICENCE AGREEMENT

dated

31 October 2014

between

LONZA SALES AG

and

NGM BIOPHARMACEUTICALS, INC.

This Amendment No. 9 (“**Amendment No. 9**”) 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, Amendment 7, dated 22 December 2020 and Amendment 8, dated 10 February 2021 (collectively the “**Agreement**”) is made effective as of the last dates of signatures between the parties (the “**Amendment No. 9 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. 9, the words and phrases defined in the Agreement shall have the same meanings in this Amendment No. 9.

2. Appendix 5 of the Agreement shall be deleted in its entirety and replaced by the Appendix 5 attached hereto in this Amendment No. 9.

3. Save as expressly provided herein through this Amendment No. 9, all terms and conditions of the Agreement shall continue in full force and effect.

AS WITNESS, the hands of the duly authorized representatives of the parties hereto the Amendment No. 9 Effective Date.

SIGNED BY: /s/ Albert Pereda
For and on behalf of
LONZA SALES AG

Associate General Counsel
Title

Nov 3, 2021
Date

SIGNED BY: /s/ Dan Mekic
For and on behalf of
LONZA SALES AG

Senior Director, Licensing
Title

Nov 3, 2021
Date

SIGNED BY: /s/ Valerie L. Pierce
For and on behalf of
NGM BIOPHARMACEUTICALS, INC.

SVP & General Counsel
Title

10/14/2021
Date

APPENDIX 5

PRODUCTS

Table A

Product	Product Name	[*]	[*]
[*]	[*]	[*]	[*]

*The Licensee shall notify Lonza in writing within a period of [*] days for [*] for each Product per the terms of the Agreement.

[*]

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 Statements (Form S-8 Nos. 333-237243 and 333-254295) 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 reports dated March 1, 2022, with respect to the consolidated financial statements of NGM Biopharmaceuticals, Inc., and the effectiveness of internal control over financial reporting of NGM Biopharmaceuticals, Inc., included in this Annual Report (Form 10-K) of NGM Biopharmaceuticals, Inc. for the year ended December 31, 2021.

/s/ Ernst & Young LLP

Redwood City, California
March 1, 2022

Exhibit 31.1

CERTIFICATION BY THE CHIEF EXECUTIVE OFFICER 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. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2022

By: /s/ David J. Woodhouse, Ph.D.

David J. Woodhouse, Ph.D.
Chief Executive Officer and Director
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION BY THE CHIEF FINANCIAL OFFICER PURSUANT TO 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) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 1, 2022

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 or her knowledge:

1. The Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2021, 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 1, 2022

/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.