

# Section 1: 424B5 (424B5)

## [Table of Contents](#)

Filed Pursuant to Rule 424(b)(5)  
Registration No. 333-217084

The information in this preliminary prospectus supplement is not complete and may be changed. A registration statement relating to these securities has been filed with the Securities and Exchange Commission and is effective. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities and they are not soliciting an offer to buy these securities in any state or other jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED FEBRUARY 6, 2020

PRELIMINARY PROSPECTUS SUPPLEMENT  
(To Prospectus dated April 25, 2017)



## Shares of Common Stock

### Warrants to Purchase up to Shares of Common Stock

We are offering \_\_\_\_\_ shares of our common stock, \$0.01 par value per share, and warrants to purchase up to \_\_\_\_\_ shares of our common stock (and the shares of common stock issuable from time to time upon exercise of such warrants). Each share of common stock sold in this offering will be accompanied by a warrant to purchase \_\_\_\_\_ share of our common stock at an exercise price of \$ \_\_\_\_\_ per share. Each share of common stock and accompanying warrant are being sold at a combined purchase price of \$ \_\_\_\_\_. The shares of common stock and warrants can only be purchased together in this offering but will be issued separately and will be immediately separable upon issuance. Subject to certain ownership limitations, the warrants will be exercisable immediately, and the warrants will expire on the fifth anniversary of the date of issuance.

Our common stock is traded on The Nasdaq Capital Market under the symbol "MGEN." On February 5, 2020, the last reported sales price of our common stock on The Nasdaq Capital Market was \$1.33 per share. We do not intend to list the warrants, nor do we expect the warrants to be quoted, on The Nasdaq Capital Market, any other national securities exchange or any other nationally recognized trading system.

**Investing in our securities involves a high degree of risk. See "[Risk Factors](#)" beginning on page S-10 of this prospectus supplement and the documents incorporated by reference into this prospectus supplement and accompanying prospectus.**

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement and accompanying prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

	PER SHARE AND ACCOMPANYING WARRANT	TOTAL
Public offering price	\$ _____	\$ _____
Underwriting discounts and commissions <sup>(1)</sup>	\$ _____	\$ _____
Proceeds to Miragen (before expenses)	\$ _____	\$ _____

(1) See "Underwriting" for a description of the compensation payable to the underwriters.

The underwriters expect to deliver the shares to investors on or about \_\_\_\_\_, 2020. We will deposit the warrants with a U.S. nationally recognized overnight courier service for delivery to investors on or about \_\_\_\_\_, 2020.

# Oppenheimer & Co.

The date of this prospectus supplement is \_\_\_\_\_, 2020.

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## Table of Contents

### TABLE OF CONTENTS

	<u>PAGE</u>
<u>ABOUT THIS PROSPECTUS SUPPLEMENT</u>	S-i
<u>PROSPECTUS SUPPLEMENT SUMMARY</u>	S-1
<u>RISK FACTORS</u>	S-10
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	S-15
<u>USE OF PROCEEDS</u>	S-16
<u>DIVIDEND POLICY</u>	S-17
<u>DILUTION</u>	S-18
<u>DESCRIPTION OF THE SECURITIES WE ARE OFFERING</u>	S-20
<u>UNDERWRITING</u>	S-22
<u>LEGAL MATTERS</u>	S-28
<u>EXPERTS</u>	S-28
<u>WHERE YOU CAN FIND ADDITIONAL INFORMATION</u>	S-29
<u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u>	S-29
<b>PROSPECTUS</b>	
<u>ABOUT THIS PROSPECTUS</u>	i
<u>SUMMARY</u>	1
<u>THE SECURITIES WE MAY OFFER</u>	4
<u>RISK FACTORS</u>	7
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	8
<u>USE OF PROCEEDS</u>	10
<u>RATIO OF EARNING TO FIXED CHARGES</u>	11
<u>DESCRIPTION OF CAPITAL STOCK</u>	12
<u>DESCRIPTION OF DEBT SECURITIES</u>	17
<u>DESCRIPTION OF WARRANTS</u>	24
<u>LEGAL OWNERSHIP OF SECURITIES</u>	27
<u>PLAN OF DISTRIBUTION</u>	31
<u>LEGAL MATTERS</u>	33
<u>EXPERTS</u>	33
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	33
<u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u>	34

---

## Table of Contents

### **ABOUT THIS PROSPECTUS SUPPLEMENT**

This prospectus supplement and the accompanying prospectus are part of a “shelf” registration statement on Form S-3 (File No. 333-217084) that we initially filed with the Securities and Exchange Commission, or SEC, on March 31, 2017 and was declared effective by the SEC on April 25, 2017. This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of common stock and warrants, and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus. The second part, the accompanying prospectus, dated April 25, 2017, including the documents incorporated by reference, provides more general information about our securities. Generally, when we refer to the prospectus, we are referring to this prospectus supplement and the accompanying prospectus combined. To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference therein that was filed with the SEC before the date of this prospectus supplement, on the other hand, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date—for example, a document incorporated by reference in the accompanying prospectus—the statement in the document having the later date modifies or supersedes the earlier statement.

You should rely only on the information contained in, or incorporated by reference into, this prospectus supplement, the accompanying prospectus and in any free writing prospectuses we have authorized for use in connection with this offering. We have not authorized anyone to provide you with different information. We are not making an offer to sell or seeking an offer to buy securities under this prospectus supplement, the accompanying prospectus and any related free writing prospectus in any jurisdiction where the offer or sale is not permitted. The information contained in this prospectus supplement, the accompanying prospectus or any related free writing prospectus, and the documents incorporated by reference herein and therein, are accurate only as of their respective dates, regardless of the time of delivery of this prospectus, the accompanying prospectus or any related free writing prospectus, or any sale of a security.

This prospectus supplement, the accompanying prospectus, and the documents incorporated by reference into this prospectus supplement and accompanying prospectus contain summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the heading “Where You Can Find Additional Information.”

This prospectus supplement and the accompanying prospectus incorporates by reference, and any free writing prospectus may contain and incorporate by reference, industry, statistical and market data from our own internal estimates and research as well as from industry and general publications and research, surveys and studies conducted by third parties. Industry publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that each of these studies and publications is reliable, we have not independently verified statistical, market and industry data from third-party sources. While we believe our internal company research is reliable and the market definitions are appropriate, neither such research nor these definitions have been verified by any independent source.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit or incorporated by reference into this prospectus supplement or accompanying prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

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## Table of Contents

This prospectus supplement, the accompanying prospectus and the documents incorporated herein and therein by reference include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus supplement, the accompanying prospectus, or any related free writing prospectus are the property of their respective owners.

Unless the context requires otherwise, references in this prospectus supplement to “Miragen,” “the Company,” “we,” “us” and “our” refer to Miragen Therapeutics, Inc. and its subsidiaries.

## PROSPECTUS SUPPLEMENT SUMMARY

*This summary highlights selected information contained elsewhere in this prospectus supplement or incorporated by reference in this prospectus supplement and the accompanying prospectus and does not contain all the information that may be important to you in determining whether to purchase our common stock and warrants. You should carefully read this entire prospectus supplement, the accompanying prospectus and any related free writing prospectus, including the risks of investing in our common stock and warrants discussed under the heading “Risk Factors” in this prospectus supplement beginning on page S-10, the accompanying prospectus and any related free writing prospectus and under similar headings in the other documents that are incorporated by reference into this prospectus supplement. You should also carefully read the information incorporated by reference into this prospectus supplement, including our financial statements, and the exhibits to the registration statement of which the accompanying prospectus is a part.*

### **Company Overview**

We are a clinical-stage biopharmaceutical company discovering and developing proprietary RNA-targeted therapies with a specific focus on microRNAs and their role in diseases where there is a high unmet medical need. We have three clinical stage product candidates: cobomarsen, remlarsen, and MRG-110. We are developing cobomarsen for the treatment of patients with certain cancers, including cutaneous T-cell lymphoma, or CTCL, and adult T-cell leukemia/lymphoma, or ATLL. Cobomarsen, is an inhibitor of microRNA-155, which is found at abnormally high levels in malignant cells of several blood cancers. We are also developing remlarsen and MRG-229, which are product candidates being designed for the treatment of patients with pathological fibrosis. These product candidates are replacements for microRNA-29, which is found at abnormally low levels in a number of pathological fibrotic conditions, including cutaneous, cardiac, renal, hepatic, pulmonary and ocular fibrosis, as well as in systemic sclerosis. MRG-110, an inhibitor of microRNA-92, is our product candidate for the treatment of heart failure and other ischemic disease.

We believe our experience in microRNA biology and chemistry, drug discovery, bioinformatics, translational medicine, and drug development will allow us to identify and develop microRNA-targeted drugs that are designed to regulate gene pathways to return diseased tissues to a healthy state. We believe that our drug discovery and development strategy will enable us to progress our product candidates from preclinical discovery to confirmation of mechanism of action in humans quickly and efficiently. The elements of this strategy include identification of biomarkers that may predict clinical benefit and monitoring outcomes in early-stage clinical trials to help guide later clinical development.

### ***Cobomarsen***

Cobomarsen is currently being evaluated for multiple indications where elevated levels of miR-155 have been implicated, including ATLL and CTCL.

#### ***Adult T-Cell Leukemia/Lymphoma (ATLL)***

In January 2020, we announced efficacy and safety data from the ATLL arm of our ongoing Phase 1 clinical trial of cobomarsen. In the trial, six patients with an aggressive subtype of ATLL who at study entry had persistent residual disease after chemotherapy or other therapy had a median survival time of 26 months with three patients still on treatment in October 2019. In the clinical trial, disease stabilization was marked by an observed decrease in biomarkers of tumor cell activation and proliferation, providing evidence of the biological mechanism effect of cobomarsen on disease stabilization. With no drug related deaths and only two serious adverse events occurring in the same patient and deemed possibly related to the study drug through October 17, 2019, cobomarsen in ATLL was observed to be generally safe and well tolerated with chronic dosing.

## Table of Contents

Based on these interim results, we are focusing our cobomarsen efforts on ATLL and will request a meeting with the FDA to explore a potential expedited development pathway for cobomarsen in ATLL. We expect to have a meeting with the FDA in the third quarter of 2020.

### *Cutaneous T-Cell Lymphoma (CTCL)*

Our most advanced trial is a Phase 2 clinical trial of cobomarsen, called SOLAR, in which cobomarsen is being evaluated in patients with mycosis fungoides, or MF, the most common type of CTCL.

In April 2019, the first CTCL patients were dosed in the SOLAR trial. The SOLAR trial is designed to evaluate the safety and efficacy of cobomarsen given in 300 mg doses by intravenous, or IV, infusion in an active control comparison trial versus Zolinza (vorinostat). In December 2019, we stopped the enrollment of new patients in SOLAR. Patients enrolled in the trial at that time will continue to be evaluated for safety and clinical response. We initially planned to enroll up to 126 patients but actually enrolled 37 patients. Despite the reduction in patient enrollment, we believe that evaluation of data from this set of patients can provide important evidence regarding the safety and efficacy of cobomarsen for the treatment of CTCL in a shorter period of time and require fewer resources. The primary endpoint of the SOLAR trial is the rate of an objective response that is durable for four months, defined as 50% or greater improvement in the severity of a patient's skin disease over the entire body. We believe that obtaining controlled clinical data from this cohort of patients may allow for a better assessment of the clinical potential of cobomarsen as compared to data from our Phase 1 trial. We intend for this controlled clinical data to form the basis of determining what additional clinical investigation of cobomarsen in CTCL is warranted, if any, and what would be required to potentially obtain regulatory approval. Topline data from this trial is expected to be announced in the third quarter of 2020.

### *microRNA-29 mimics*

We are developing miR-29 mimics or replacements for miR-29, a microRNA that is found at abnormally low levels in a number of pathological fibrotic conditions. Our lead microRNA-29 mimics are remlarsen and MRG-229. Remlarsen is our most advanced product candidate in fibrosis, which is currently being evaluated in a Phase 2 clinical trial assessing its safety, tolerability, and activity in the potential prevention or reduction of keloid formation in patients with a history of keloid scars, a form of pathological scarring. In December 2019, we reported interim data from this clinical trial, which suggests that remlarsen was generally safe and well tolerated, treatment had no negative effect on healing reported and initial volume reductions in treated keloids compared to placebo in a subset of patients were observed. Based on this data, we have decided to continue our analysis of patient data at the one-year primary endpoint of the study and expect to report data in the second half of 2020. With this data, we expect to seek a collaboration partner from remlarsen.

In addition, we are developing MRG-229 for idiopathic pulmonary fibrosis, or IPF. We believe that the efficacy and safety profile of MRG-229 positions this product candidate as a potentially differentiated approach to the treatment of IPF. We expect to report additional preclinical safety and efficacy data during the first half of 2020. This program is supported by a grant in collaboration with the National Institutes of Health and Yale University.

### **MRG-110**

MRG-110 is an inhibitor of miR-92, a microRNA expressed in endothelial cells. We have completed two Phase 1 clinical trials of MRG-110, which is being evaluated for the potential treatment of heart failure and other conditions where patients may benefit from increased vascular flow and accelerated healing, such as complicated lacerations in high risk patients. We have historically developed MRG-110 under a license and collaboration agreement, or the Servier Collaboration Agreement, with Les Laboratoires Servier and Institut de Recherches





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## Table of Contents

### **Preliminary Financial Data**

While we have not finalized our full financial results for the year ended December 31, 2019, we expect to report that we had approximately \$26.8 million of cash, cash equivalents and short-term investments as of December 31, 2019. Based on our cash, cash equivalents and short-term investments as of December 31, 2019 and after giving effect to this offering and to sales under the ATM Agreement and Aspire Agreement (each as defined herein) between December 31, 2019 and the date of this prospectus supplement, we believe our cash and cash equivalents will be sufficient to fund our operations through

This amount is preliminary, has not been audited and is subject to change pending completion of our audited financial statements for the year ended December 31, 2019. Additional information and disclosures would be required for a more complete understanding of our financial position and results of operations as of December 31, 2019. We expect to complete our audited financial statements for the year ended December 31, 2019 subsequent to the completion of this offering. It is possible that we or our independent registered public accounting firm may identify items that require us to make adjustments to the preliminary estimated cash, cash equivalents and short-term investments balance set forth above and those changes could be material.

The preliminary financial data included in this prospectus supplement has been prepared by, and is the responsibility of, our management. KPMG LLP has not audited, reviewed, compiled, or performed any procedures with respect to this preliminary financial data. Accordingly, KPMG LLP does not express an opinion or any other form of assurance with respect thereto.

### **Our Strategy**

We seek to use our expertise and understanding of microRNA biology, oligonucleotide chemistry and product development to create novel products that have the potential to transform the treatment of patients with serious diseases. The key components of our strategy are as follows:

- Continue to develop cobomarsen for blood cancers where the disease process appears to be correlated with an increase in miR-155 levels, focusing on CTCL and ATLL.
- Continue to develop remlarsen and MRG-229 for pathological fibrosis, focusing on the development of MRG-229 in IPF.
- Utilize rare disease development pathways at the FDA and comparable foreign regulatory agencies to accelerate progression to late stage development and early approval.
- Collaborate with biotechnology and pharmaceutical companies to develop additional product candidates.
- Use our in-house research and translational expertise to further develop our product candidate pipeline.

### **Our Approach to Drug Discovery and Development**

Our research and development strategy is designed to accelerate timelines and reduce development risk. The goal of our translational medicine strategy is to progress rapidly to first-in-human trials once we have adequately established mechanistic proof-of-concept, consisting of pharmacokinetics, pharmacodynamics, safety, and manufacturability of the product candidate in preclinical studies. Programs that progress into human trials are designed to be accompanied by a validated set of pharmacodynamic biomarkers that allow us to verify the mechanism of drug action in humans and to potentially stratify and enrich the study population. Through this approach, we seek to reduce the risk of the programs by quantifying target engagement and identifying the likely efficacious dose prior to progression to Phase 2 clinical trials.

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## Table of Contents

### **Background on microRNA**

microRNAs are transcribed from the genome and unlike messenger RNA, or mRNA, they do not encode proteins. microRNAs typically function by preventing the translation of mRNAs into proteins and/or by triggering degradation of these mRNAs. Studies have shown that microRNA gene regulation is often not a decisive on and off switch but a subtle function that fine-tunes cellular phenotypes that becomes more pronounced during stress or disease conditions. microRNAs were first discovered in 1993 and have since been found in nearly every biological system examined since that time. They are highly conserved across species, which underscores their importance to biological functions and cellular processes. According to the Sanger Institute, over 1,000 microRNAs have been identified in humans.

A body of evidence has shown that inappropriate levels of particular microRNAs are directly linked to a range of serious diseases, many of which are poorly served by existing therapies. microRNAs can affect the balance of protein expression and serve as “command and control” nodes that directly coordinate multiple critical systems simultaneously. This effect on systems biology is a naturally occurring homeostatic process that becomes disrupted in certain disease states. As a result, developing microRNA therapeutics is fundamentally different from the single-protein, single-target approach that is the foundation of traditional small and large molecule drugs.

### **Risks Associated with our Business**

Our business is subject to numerous risks and uncertainties, including those highlighted in the section titled “Risk Factors” on page S-10 of this prospectus supplement and those described under similar headings in the documents incorporated by reference into this prospectus supplement. These risks include:

- We will need to raise additional capital, and if we are unable to do so when needed, we will not be able to continue as a going concern.
- Our management, as of September 30, 2019, has concluded that due to our need for additional capital, and the uncertainties surrounding our ability to raise such funding, substantial doubt exists as to our ability to continue as a going concern.
- We have historically incurred losses, have a limited operating history on which to assess our business, and anticipate that we will continue to incur significant losses for the foreseeable future.
- Clinical trials are costly, time consuming, and inherently risky, and we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.
- Our microRNA-targeted therapeutic product candidates are based on a relatively novel technology, which makes it unusually difficult to predict the time and cost of development and the time and cost, or likelihood, of subsequently obtaining regulatory approval. To date, no microRNA-targeted therapeutics have been approved for marketing in the United States.
- We are heavily dependent on the success of our product candidates, which are in the early stages of clinical development. Some of our product candidates have produced results only in non-clinical settings, or for other indications than those for which we contemplate conducting development and seeking FDA approval, and we cannot give any assurance that we will generate data for any of our product candidates sufficiently supportive to receive regulatory approval in our planned indications, which will be required before they can be commercialized.
- We may find it difficult to enroll patients in our clinical trials given the limited number of patients who have the diseases for which our product candidates are being studied. Difficulty in enrolling patients could delay or prevent clinical trials of our product candidates.

## Table of Contents

- We may attempt to obtain accelerated approval of our product candidates. If we are unable to obtain accelerated approval, we may be required to conduct clinical trials beyond those that we contemplate, or the size and duration of our pivotal clinical trials could be greater than currently planned, which could increase the expense of obtaining, reduce the likelihood of obtaining, and/or delay the timing of obtaining necessary marketing approvals. Even if we receive accelerated approval from the FDA, the FDA may require that we conduct confirmatory trials to verify clinical benefit. If our confirmatory trials do not verify clinical benefit, or if we do not comply with rigorous post-approval requirements, the FDA may seek to withdraw accelerated approval.
- We may not be successful in obtaining or maintaining necessary rights to microRNA targets, product compounds and processes for our development pipeline through acquisitions and in-licenses.
- We rely on third parties to conduct our clinical trials, manufacture our product candidates, and perform other services. If these third parties do not successfully perform and comply with regulatory requirements, we may not be able to successfully complete clinical development, obtain regulatory approval, or commercialize our product candidates and our business could be substantially harmed.
- If we do not effectively manage changes in our operations, our business may be harmed; we have taken substantial restructuring charges in the past and we may need to take material restructuring charges in the future.
- The market price of our common stock is expected to be volatile, and the market price of our common stock may drop in the future.
- Our failure to meet the continued listing requirements of The Nasdaq Capital Market could result in a delisting of our common stock.

### **Our Corporate Information**

We were founded in New York as a Delaware limited liability company in January 2010 under the name Myeloma Health LLC. Signal Genetics LLC was formed as a Delaware limited liability company in December 2010. Effective January 1, 2011, substantially all of the member interests in Myeloma Health LLC were exchanged for member interests in Signal Genetics LLC and Myeloma Health LLC became a subsidiary of Signal Genetics LLC. Immediately prior to the pricing of our initial public offering, on June 17, 2014, Signal Genetics LLC converted from a Delaware limited liability company to a Delaware corporation, or the Corporate Conversion. In connection with the Corporate Conversion, each unit of Signal Genetics LLC was converted into a share of our common stock, the members of Signal Genetics LLC became our stockholders and we succeeded to the business of Signal Genetics LLC and its consolidated subsidiaries. On February 13, 2017, we acquired a privately-held company named Miragen Therapeutics, Inc. and, immediately following the acquisition, we changed our name to "Miragen Therapeutics, Inc." Our common stock began trading on The Nasdaq Capital Market under the ticker symbol "MGEN" on February 14, 2017.

Our principal executive office is located at 6200 Lookout Road, Boulder, CO 80301, and our telephone number is (720) 643-5200. Our corporate website address is [www.miragen.com](http://www.miragen.com). We do not incorporate the information on, or accessible through, our website into this prospectus supplement and the accompanying prospectus, and you should not consider any information on, or accessible through, our website as part of this prospectus supplement and the accompanying prospectus.

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[Table of Contents](#)

**Implications of Being a Smaller Reporting Company**

We are a smaller reporting company as defined in the Securities Exchange Act of 1934, as amended, or the Exchange Act. We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as (i) our voting and non-voting common stock held by non-affiliates is less than \$250.0 million as of June 30 of the most recently completed fiscal year or (ii) our annual revenue is less than \$100.0 million during the most recently completed fiscal year and our voting and non-voting common stock held by non-affiliates is less than \$700.0 million measured as of June 30 of such fiscal year. As a result, the information we provide stockholders may be different than the information you receive from other public companies in which you hold stock.

## Table of Contents

### THE OFFERING

Common stock offered by us	shares.
Warrants offered by us	Warrants to purchase an aggregate of _____ shares of our common stock (with a warrant to purchase _____ share of common stock being issued in connection with each share of common stock issued in this offering). Each warrant will have an exercise price of \$ _____ per share, will be exercisable immediately and will expire on the fifth anniversary of the date of issuance.  This prospectus supplement also relates to the offering of the shares of common stock issuable upon exercise of the warrants.
Common stock to be outstanding immediately after this offering	shares
Use of proceeds	We intend to use the net proceeds for working capital and general corporate purposes, which include the funding of development of our product candidates, and general and administrative expenses.  See “ <u>Use of Proceeds</u> ” on page S-16 of this prospectus supplement for more information.
Market for the common stock	Our common stock is listed on The Nasdaq Capital Market under the symbol “MGEN”. We do not intend to list the warrants on The Nasdaq Capital Market, any other national securities exchange or any other nationally recognized trading system.
Risk factors	See “ <u>Risk Factors</u> ” on page S-10 of this prospectus supplement for a discussion of certain factors to consider carefully before deciding to purchase any shares of our common stock and accompanying warrants.

The discussion above is based on the number of shares outstanding as of September 30, 2019. As of that date, we had 31,181,749 shares of common stock outstanding, excluding the shares of common stock issuable upon exercise of the warrants being offered by us in this offering and also excluding, in each case as of September 30, 2019:

- 4,034,348 shares of our common stock issuable upon the exercise of our options outstanding, with a weighted-average exercise price of \$5.20 per share;
- 46,522 shares of our common stock issuable upon the exercise of our warrants outstanding, with a weighted-average exercise price of \$17.93 per share;
- 1,290,930 shares of our common stock reserved for future issuance under our 2016 Equity Incentive Plan and any shares of our common stock that become available pursuant to provisions in such plan that automatically increase the share reserve on January 1 of each calendar year; and
- 622,346 shares of our common stock reserved for future issuance under our 2016 Employee Stock Purchase Plan and any shares of our common stock that become available pursuant to provisions in such plan that automatically increase the share reserve on January 1 of each calendar year.

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## Table of Contents

Except as otherwise indicated, all information in this prospectus supplement assumes:

- no exercise of our outstanding options to purchase our common stock since September 30, 2019; and
- no exercise of our outstanding warrants to purchase our common stock since September 30, 2019.

The number of shares of common stock to be outstanding immediately following this offering as shown above does not include up to \$39.0 million of shares of our common stock that remained available for sale at September 30, 2019 under our Common Stock Sales Agreement with Cowen and Company, LLC, or the ATM Agreement. Between September 30, 2019 and the date of this prospectus supplement, 1,488,822 shares were sold under the ATM Agreement.

The number of shares of common stock to be outstanding immediately following this offering as shown above does not include up to \$20.0 million of shares of our common stock that we may issue from time to time to Aspire Capital Fund, LLC, an Illinois limited liability company, or Aspire Capital, under a Common Stock Purchase Agreement, entered into on December 11, 2019 between Aspire Capital and us, or the Aspire Agreement. Between September 30, 2019 and the date of this prospectus supplement, 4,757,544 shares of common stock were sold under the Aspire Agreement, which amount includes (i) 959,079 shares of common stock issued to Aspire Capital as consideration for its commitment to purchase shares of our common stock under the Aspire Agreement, (ii) 1,598,465 shares of common stock issued to Aspire Capital for an aggregate sale price of \$1.0 million as an initial purchase under the Aspire Agreement and (iii) 2,200,000 shares of common stock issued to Aspire Capital as purchase shares under the terms of the Aspire Agreement.

The number of shares of common stock to be outstanding immediately following this offering as shown above does not include up to \$4.0 million of shares of our common stock that remained available for sale at September 30, 2019 under our Common Stock Purchase Agreement, or the LLS Stock Purchase Agreement, with LLS TAP Miragen, LLC, as assignee of the Leukemia and Lymphoma Society, or LLS. Between September 30, 2019 and the date of this prospectus supplement, 606,364 shares were sold under the LLS Stock Purchase Agreement. As a result of the modifications of the SOLAR trial we announced in December 2019, we do not anticipate meeting the milestones under the LLS Stock Purchase Agreement and as such, do not expect we will receive the remaining proceeds available under the LLS Stock Purchase Agreement unless the agreement is amended, which we can provide no assurances will occur.

## RISK FACTORS

*Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks and uncertainties described under the heading “Risk Factors” included or incorporated by reference in this prospectus supplement and the accompanying prospectus and discussed under the heading “Risk Factors” contained in our most recent Quarterly Report on Form 10-Q, as may be amended or updated by subsequent reports that are incorporated by reference into this prospectus supplement in their entirety. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be adversely affected, which could cause the trading price of our common stock and value of the warrants to decline, resulting in a loss of all or part of your investment. Please also read carefully the discussion below under the heading “Special Note Regarding Forward-Looking Statements.”*

### Risks Related to this Offering

***If you purchase our common stock and accompanying warrants in this offering, you will incur immediate and substantial dilution in the book value of your investment. You will experience further dilution if we issue additional equity securities in future fundraising transactions.***

Since we expect that the public offering price per share of our common stock and the accompanying warrant in this offering will be substantially higher than the net tangible book value per share of our common stock, you will suffer substantial dilution with respect to the net tangible book value of the common stock you purchase in this offering. Based on a public offering price of \$ \_\_\_\_\_ per share and accompanying warrant and our net tangible book value as of September 30, 2019, if you purchase shares of common stock and accompanying warrants in this offering, you will suffer immediate and substantial dilution of \$ \_\_\_\_\_ per share with respect to the net tangible book value of the common stock. See the section entitled “Dilution” for a more detailed discussion of the dilution you will incur if you purchase securities in this offering.

In addition, we have a significant number of stock options and warrants outstanding. To the extent that outstanding stock options or warrants, including the warrants offered hereby, have been or may be exercised or other shares issued, investors purchasing our common stock and accompanying warrants in this offering may experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders, result in downward pressure on the price of our common stock and a decline in the value of the warrants offered in this offering.

***We have broad discretion in the use of the net proceeds from this offering and we may not use them effectively.***

Our management will have broad discretion in the application of the net proceeds from this offering, including for any of the purposes described in the section titled “Use of Proceeds,” and you will be relying on the judgment of our management regarding the application of these proceeds. You will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. Our management might not apply the net proceeds or our existing cash in ways that ultimately increase the value of your investment. If we do not invest or apply the net proceeds from this offering or our existing cash in ways that enhance stockholder value, we may fail to achieve expected financial results, which could cause our stock price to decline. We intend to use the net proceeds from the offering for working capital and general corporate purposes, which include the funding of development of our product candidates, and general and administrative expenses. These investments may not yield a favorable return to our stockholders. See “Use of Proceeds.”

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## Table of Contents

***A significant portion of our total outstanding shares are eligible to be sold into the market, which could cause the market price of our common stock to drop significantly and the value of the warrants to decline, even if our business is doing well.***

Sales of a substantial number of shares of our common stock in the public market, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. Upon completion of this offering, based on our shares outstanding as of September 30, 2019, we will have \_\_\_\_\_ shares of common stock outstanding, excluding the shares of common stock issuable upon exercise of the warrants offered hereby. Of these shares, \_\_\_\_\_ are subject to a contractual lock-up with the underwriters for this offering for a period of 90 days following this offering. These shares can be sold, subject to any applicable volume limitations under federal securities laws, after the earlier of the expiration of, or release from, the 90-day lock-up period. The balance of our outstanding shares of common stock, including any shares purchased in this offering, may be resold into the public market immediately without restriction, unless owned or purchased by our affiliates.

As of September 30, 2019, there were approximately 4.0 million shares subject to outstanding options and restricted stock units or that are otherwise issuable under our equity compensation plans, all of which shares we have registered under the Securities Act of 1933, as amended, or the Securities Act, on a registration statement on Form S-8. These shares can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates and the lock-up agreements described above, to the extent applicable.

***There is no public market for the warrants to purchase shares of our common stock being offered in this offering.***

There is no established public trading market for the warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply to list the warrants on any national securities exchange or other nationally recognized trading system, including The Nasdaq Capital Market. Without an active market, the liquidity of the warrants will be limited.

***Holders of our warrants will have no rights as a common stockholder until they acquire our common stock.***

Until you acquire shares of our common stock upon exercise of the warrants, you will have no rights with respect to shares of our common stock issuable upon exercise of the warrants. Upon exercise of your warrants, you will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise date.

***The warrants are speculative in nature.***

The warrants offered hereby do not confer any rights of common stock ownership on their holders, such as voting rights or the right to receive dividends, but rather merely represent the right to acquire shares of common stock at a fixed price. Specifically, commencing on the date of issuance, holders of the warrants may acquire the common stock issuable upon exercise of such warrants at an exercise price of \$ \_\_\_\_\_ per share. Moreover, following this offering, the market value of the warrants is uncertain and there can be no assurance that the market value of the warrants will equal or exceed their public offering price. There can be no assurance that the market price of the common stock will ever equal or exceed the exercise price of the warrants and consequently, whether it will ever be profitable for holders of the warrants to exercise the warrants.

***Raising additional capital, including as a result of this offering, may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our product candidates.***

Until such time, if ever, as we can generate substantial revenue from the sale of our product candidates, we expect to finance our cash needs through a combination of equity offerings, debt financings and license and



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## Table of Contents

development agreements. To the extent that we raise additional capital through the sale of equity securities, including from this offering, or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder or holder of warrants. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings or other arrangements with third parties when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to third parties to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

To the extent that we raise additional capital through the sale of equity, including pursuant to any sales under the ATM Agreement, the Aspire Agreement, the LLS Stock Purchase Agreement, convertible debt or other securities convertible into equity, the ownership interest of our stockholders will be diluted, and the terms of these new securities may include liquidation or other preferences that adversely affect rights of our stockholders. For instance, through the date of this prospectus supplement, we had sold (i) pursuant to the terms of the ATM Agreement, approximately 2.8 million shares of our common stock for aggregate net proceeds of approximately \$11.7 million, (ii) pursuant to the terms of the Aspire Agreement, approximately 4.8 million shares of our common stock for aggregate net proceeds of approximately \$4.9 million, and (iii) pursuant to the terms of the LLS Stock Purchase Agreement, approximately 0.8 million shares of our common stock for aggregate net proceeds of approximately \$1.4 million. We anticipate that we will continue to make sales of our common stock under the ATM Agreement and the Aspire Agreement from time to time into the foreseeable future, subject to the 90-day lock-up period, and we may sell shares of our common stock of up to \$37.9 million and up to \$14.9 million in additional aggregate value under the ATM Agreement and Aspire Agreement, respectively. As a result of the modifications of the SOLAR trial we announced in December 2019, we do not anticipate meeting the milestones under the LLS Stock Purchase Agreement and as such, do not expect we will receive the remaining \$3.5 million in proceeds available under the LLS Stock Purchase Agreement unless the agreement is amended, which we can provide no assurances will occur. Sales under the ATM Agreement, the Aspire Agreement, or the LLS Stock Purchase Agreement dilute the ownership interest of our stockholders and may cause the price per share of our common stock to decrease and the value of the warrants to decline.

### ***Terms of subsequent financings may adversely impact our stockholders.***

To finance our future business plans and working capital needs, we will have to raise funds through the issuance of equity or debt securities in addition to sales in this offering. Depending on the type and the terms of any financing we pursue, stockholders' rights and the value of their investment in our common stock and the warrants could be reduced. A financing could involve one or more types of securities including common stock, convertible debt or warrants to acquire common stock. These securities could be issued at or below the then prevailing market price for our common stock. In addition, if we issue secured debt securities, the holders of the debt would have a claim to our assets that would be senior to the rights of stockholders until the debt is paid. Interest on these debt securities would increase costs and negatively impact operating results. If the issuance of new securities results in diminished rights to holders of our common stock, the market price of our common stock could be negatively impacted and the value of the warrants could decline.

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## Table of Contents

### ***Our failure to meet the continued listing requirements of The Nasdaq Capital Market could result in a delisting of our common stock.***

Our common stock is currently listed on The Nasdaq Capital Market. To maintain the listing of our common stock on The Nasdaq Capital Market, we are required to meet certain listing requirements, including, among others, a minimum bid price of \$1.00 per share.

If we fail to satisfy the continued listing requirements of The Nasdaq Capital Market, such as the corporate governance requirements or the minimum closing bid price requirement, The Nasdaq Capital Market may take steps to delist our common stock, which could have a materially adverse effect on our ability to raise additional funds as well as the price and liquidity of our common stock. Such a delisting would likely have a negative effect on the price of our common stock and would impair our stockholders' ability to sell or purchase our common stock when they wish to do so. In the event of a delisting, we can provide no assurance that any action taken by us to restore compliance with listing requirements would allow our common stock to become listed again, stabilize the market price or improve the liquidity of our common stock, prevent our common stock from dropping below the Nasdaq minimum bid price requirement, or prevent future non-compliance with The Nasdaq Capital Market's listing requirements.

On October 28, 2019, we received a letter from the Listing Qualifications Department of The Nasdaq Stock Market LLC, or Nasdaq, notifying us that the listing of our common stock was not in compliance with Nasdaq Listing Rule 5550(a)(2) for continued listing on The Nasdaq Capital Market, as the minimum bid price of our listed securities was less than \$1.00 per share for the previous 30 consecutive business days. Under Nasdaq Listing Rule 5810(c)(3)(A), we have a period of 180 calendar days, or until April 27, 2020, to regain compliance with the rule. To regain compliance, during this 180-day compliance period, the minimum bid price of our listed securities must close at \$1.00 per share or more for a minimum of 10 consecutive business days.

In the event that we do not regain compliance with the Nasdaq Listing Rules prior to the expiration of the 180-day compliance period, we may be eligible for additional time to regain compliance pursuant to Nasdaq Listing Rule 5810(c)(3)(A)(ii) by meeting the continued listing requirement for market value of publicly held shares and all other applicable standards for initial listing on The Nasdaq Capital Market, with the exception of the minimum bid price requirement. In addition, we would need to provide written notice to Nasdaq of our intention to cure the minimum bid price deficiency during the second compliance period by effecting a reverse stock split, if necessary. As part of its review process, the Nasdaq staff will make a determination of whether it believes we will be able to cure this deficiency. Should the Nasdaq staff conclude that we will not be able to cure the deficiency, or should we determine not to make the required representation, Nasdaq will provide notice that our shares of common stock will be subject to delisting.

If we do not regain compliance within the allotted compliance period(s), including any extensions that may be granted by Nasdaq, Nasdaq will provide notice that our shares of common stock will be subject to delisting. At such time, we may appeal the delisting determination to a hearings panel pursuant to the procedures set forth in the applicable Nasdaq Listing Rules. We intend to actively monitor the minimum bid price of our listed securities and, as appropriate, will consider available options to resolve the deficiencies and regain compliance with the Nasdaq Listing Rules, including effecting a reverse stock split.

There can be no assurance that we will be successful in maintaining the listing of our common stock on The Nasdaq Capital Market. This could impair the liquidity and market price of our common stock. In addition, the delisting of our common stock from a national exchange could have a material adverse effect on our access to capital markets, and any limitation on market liquidity or reduction in the price of our common stock as a result of that delisting could adversely affect our ability to raise capital on terms acceptable to us, or at all.

We do not intend to list the warrants on The Nasdaq Capital Market, any other national securities exchange or any other nationally recognized trading system.

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[Table of Contents](#)

*We do not currently intend to pay dividends on our common stock, and any return to investors is expected to come, if at all, only from potential increases in the price of our common stock.*

At the present time, we intend to use available funds to finance our operations. Accordingly, while payment of dividends rests within the discretion of our board of directors, we have no intention of paying any such dividends in the foreseeable future. Any return to investors is expected to come, if at all, only from potential increases in the price of our common stock.

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## Table of Contents

### **SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS**

This prospectus supplement, and the accompanying prospectus contains, and any free writing prospectus we have authorized for use in connection with this offering, including the documents we incorporate by reference therein may contain, forward-looking statements that involve substantial risks and uncertainties for purposes of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. All statements contained in this prospectus supplement and the documents referenced above, other than statements of historical fact, including statements regarding our strategy, future operations, future financial position, future revenue, projected expenses, prospects, plans and objectives of management are forward-looking statements. The words “believe,” “may,” “will,” “estimate,” “continue,” “anticipate,” “intend,” “plan,” “expect,” “predict,” “potential,” “opportunity,” “goals,” or “should,” and similar expressions are intended to identify forward-looking statements.

Such statements are based on management’s current expectations and involve risks and uncertainties. Actual results and performance could differ materially from those projected in the forward-looking statements as a result of many factors, including, without limitation, statements relating to:

- our future research and development activities, including clinical testing and the costs and timing thereof;
- our strategy, including clinical development of cobomarsen, our regulatory and clinical strategies for cobomarsen, remlarsen, MRG-229 and other product candidates, and the clinical and commercial potential of our product candidates, if approved;
- sufficiency of our cash resources;
- our ability to raise additional funding when needed;
- any statements concerning anticipated regulatory activities or licensing or collaborative arrangements;
- our research and development and other expenses;
- our operations and legal risks;
- our ability to maintain listing on a national securities exchange;
- our intended use of the net proceeds from this offering; and
- any statement of assumptions underlying any of the foregoing.

We have based these forward-looking statements largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described above under the heading “Risk Factors.” Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the future events and trends discussed in this prospectus supplement and accompanying prospectus may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

We undertake no obligation to revise or publicly release the results of any revision to these forward-looking statements, except as required by law. Given these risks and uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements. All forward-looking statements are qualified in their entirety by this cautionary statement.

## USE OF PROCEEDS

We estimate the net proceeds to us in this offering will be approximately \$ [redacted] after deducting the underwriting discounts and commissions and estimated offering expenses payable by us and excluding the proceeds, if any, from the exercise of the warrants. If a warrant holder elects to exercise the warrants issued in this offering, we would also receive proceeds from the exercise of the warrants in the amount of \$ [redacted] per share. We cannot predict when or if the warrants will be exercised. It is possible that the warrants may expire and may never be exercised.

We intend to use the net proceeds for working capital and general corporate purposes, which include the funding of development of our product candidates, and general and administrative expenses.

The expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. The amounts and timing of our actual expenditures depend on numerous factors, including the progress of our product candidate development, status and results from preclinical studies, clinical trials, collaborations we may enter into with third parties for our product candidates, and any unforeseen cash needs.

Due to the uncertainties inherent in the preclinical and clinical development and regulatory process, it is difficult to estimate with certainty the exact amounts of the net proceeds from this offering that may be used for any purpose. As a result, our management will have broad discretion in applying the net proceeds from this offering. Pending their ultimate use, we plan to invest the net proceeds from this offering in short- and intermediate-term, interest bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government.

**DIVIDEND POLICY**

We have never declared or paid any cash dividends on our capital stock. We anticipate that we will retain all of our future earnings, if any, for use in the operation and expansion of our business and do not anticipate paying cash dividends in the foreseeable future. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to compliance with certain covenants under our credit facility, which restricts or limits our ability to declare or pay dividends.

## Table of Contents

### DILUTION

If you invest in our common stock, your interest will be immediately diluted to the extent of the difference between the public offering price per share of our common stock and accompanying warrant in this offering and the adjusted net tangible book value per share of our common stock after this offering.

The net tangible book value of our common stock as of September 30, 2019 was approximately \$22.6 million, or \$0.72 per share of common stock. The net tangible book value per share of our common stock is determined by dividing our total tangible assets, less total liabilities, by the number of shares of our common stock outstanding as of September 30, 2019. Dilution with respect to net tangible book value per share represents the difference between the amount per share paid by purchasers of shares of common stock and accompanying warrants in this offering and the net tangible book value per share of our common stock immediately after this offering.

After giving effect to the sale of \_\_\_\_\_ shares of our common stock and warrants to purchase \_\_\_\_\_ shares of our common stock in this offering at the offering price of \$ \_\_\_\_\_ per share and accompanying warrant, and after deducting underwriting discounts and estimated offering expenses payable by us, and excluding the proceeds and shares issuable, if any, from the exercise of the warrants issued pursuant to this offering, our as adjusted net tangible book value as of September 30, 2019 would have been approximately \$ \_\_\_\_\_, or \$ \_\_\_\_\_ per share. This represents an immediate increase in net tangible book value of \$ \_\_\_\_\_ per share to existing stockholders and immediate dilution of \$ \_\_\_\_\_ per share to investors purchasing our common stock and warrants to purchase shares of our common stock in this offering at the public offering price. The following table illustrates this dilution on a per share basis:

Public offering price per share and accompanying warrant	\$
Net tangible book value per share of as of September 30, 2019	\$0.72
Increase in net tangible book value per share attributable to this offering	<u>          </u>
As adjusted net tangible book value per share as of September 30, 2019, after giving effect to this offering	<u>          </u>
Dilution per share to investors purchasing our common stock and warrants to purchase shares of our common stock in this offering	<u><u>          </u></u>

The discussion and table above are based on the number of shares outstanding as of September 30, 2019. As of that date, we had 31,181,749 shares of common stock outstanding, excluding the shares of common stock issuable upon exercise of the warrants being offered by us in this offering and also excluding, in each case as of September 30, 2019:

- 4,034,348 shares of our common stock issuable upon the exercise of our options outstanding, with a weighted-average exercise price of \$5.20 per share;
- 46,522 shares of our common stock issuable upon the exercise of our warrants outstanding, with a weighted-average exercise price of \$17.93 per share;
- 1,290,930 shares of our common stock reserved for future issuance under our 2016 Equity Incentive Plan and any shares of our common stock that become available pursuant to provisions in such plan that automatically increase the share reserve on January 1 of each calendar year; and
- 622,346 shares of our common stock reserved for future issuance under our 2016 Employee Stock Purchase Plan and any shares of our common stock that become available pursuant to provisions in such plan that automatically increase the share reserve on January 1 of each calendar year.

The discussion and table above do not include up to \$39.0 million of shares of our common stock that remained available for sale at September 30, 2019 under the ATM Agreement. Between September 30, 2019 and the date of this prospectus supplement, 1,488,822 shares were sold under the ATM Agreement.

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## Table of Contents

The discussion and table above do not include up to \$20.0 million of shares of our common stock that we may issue from time to time to Aspire Capital under the Aspire Agreement. Between September 30, 2019 and the date of this prospectus supplement, 4,757,544 shares of common stock were sold under the Aspire Agreement, which amount includes (i) 959,079 shares of common stock issued to Aspire Capital as consideration for its commitment to purchase shares of our common stock under the Aspire Agreement, (ii) 1,598,465 shares of common stock issued to Aspire Capital for an aggregate sale price of \$1.0 million as an initial purchase under the Aspire Agreement and (iii) 2,200,000 shares of common stock issued to Aspire Capital as purchase shares under the terms of the Aspire Agreement.

The discussion and table above do not include up to \$4.0 million of shares of our common stock that remained available for sale at September 30, 2019 under the LLS Stock Purchase Agreement. Between September 30, 2019 and the date of this prospectus supplement, 606,364 shares were sold under the LLS Stock Purchase Agreement. As a result of the modifications of the SOLAR trial we announced in December 2019, we do not anticipate meeting the milestones under the LLS Stock Purchase Agreement and as such, do not expect we will receive the remaining proceeds available under the LLS Stock Purchase Agreement unless the agreement is amended, which we can provide no assurances will occur.

To the extent that any shares are issued upon exercise of our outstanding options or outstanding warrants, including warrants offered hereby, investors purchasing our common stock and accompanying warrants in this offering will experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations, including under the ATM Agreement or the Aspire Agreement, even if we believe we have sufficient funds for our current or future operating plans. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.



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[Table of Contents](#)

**DESCRIPTION OF THE SECURITIES WE ARE OFFERING**

**Common Stock**

See “Description of Capital Stock—Common Stock” on page 12 of the accompanying prospectus for a description of the material terms of our common stock.

**Warrants**

The following is a brief summary of certain terms and conditions of the warrants and is subject in all respects to the provisions contained in the warrants.

*Form.* The warrants will be issued as individual warrant agreements to the investors. We will file a copy of the form of warrant with the SEC as an exhibit to a Current Report on Form 8-K to be filed in connection with this offering.

*Exercisability.* The warrants will be exercisable at any time following their original issuance and will expire on the fifth anniversary of the date of issuance.

The warrants will be exercisable, at the option of each holder, in whole or in part by delivering to us a duly executed exercise notice and by payment in full in immediately available funds for the number of shares of common stock purchased upon such exercise. If a registration statement registering the issuance of the shares of common stock underlying the warrants under the Securities Act is not then effective or available, and if a resale registration statement registering the resale of the shares of common stock underlying the warrants under the Securities Act is also not then effective or available, the holder may exercise the warrant through a cashless exercise, in whole or in part, in which case the holder would receive upon such exercise the net number of shares of common stock determined according to the formula set forth in the warrant. No fractional shares of common stock will be issued in connection with the exercise of a warrant. In lieu of fractional shares, we will either pay the holder an amount in cash equal to the fractional amount multiplied by the exercise price or round up to the next whole share.

*Exercise Limitation.* A holder will not have the right to exercise any portion of a warrant if the holder (together with its affiliates) would beneficially own in excess of 4.99% of the number of shares of our stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the warrants. However, any holder may increase such percentage up to 9.99%, provided that any increase in such percentage shall not be effective until 61 days after such notice to us.

*Exercise Price.* The initial exercise price per share of common stock purchasable upon exercise of the warrants is \$ . The exercise price is subject to appropriate adjustment in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting our common stock.

*Transferability.* Subject to applicable laws, the warrants may be offered for sale, sold, transferred or assigned without our consent. There is currently no trading market for the warrants and a trading market is not expected to develop.

*Exchange Listing.* We do not intend to list the warrants on any securities exchange or nationally recognized trading system, including The Nasdaq Capital Market.

*Fundamental Transactions.* In the event of a fundamental transaction, as described in the warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the holders of the warrants will be entitled to receive upon exercise of the warrants the kind and amount

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## Table of Contents

of securities, cash or other property that the holders would have received had they exercised the warrants immediately prior to such fundamental transaction. In addition, in the event of a fundamental transaction which is approved by our board of directors, the holders of the warrants have the right to require us or a successor entity to redeem the warrants for cash in the amount of the Black-Scholes value of the unexercised portion of the warrants on the date of the consummation of the fundamental transaction. In the event of a fundamental transaction which is not approved by our board of directors, the holders of the Warrants have the right to require us or a successor entity to redeem the warrants for the consideration paid in the fundamental transaction in the amount of the Black Scholes value of the unexercised portion of the Warrants on the date of the consummation of the fundamental transaction payable at our option in either shares of our common stock (or, in certain cases, in the securities of the successor entity) or cash.

*Rights as a Stockholder.* Except as otherwise provided in the warrants or by virtue of such holder's ownership of shares of our common stock, the holder of a warrant does not have the rights or privileges of a holder of our common stock, including any voting rights, until the holder exercises the warrant.

[Table of Contents](#)

**UNDERWRITING**

We entered into an underwriting agreement with the underwriters named below on \_\_\_\_\_, 2020. Oppenheimer & Co. Inc. is acting as the representative of the underwriters. The underwriting agreement provides for the purchase of a specific number of shares of common stock and accompanying warrants to purchase shares of common stock by each of the underwriters. The underwriters' obligations are several, which means that each underwriter is required to purchase a specified number of shares of common stock and accompanying warrants, but is not responsible for the commitment of any other underwriter to purchase shares of common stock and accompanying warrants. Subject to the terms and conditions of the underwriting agreement, each underwriter has severally agreed to purchase the shares of common stock and accompanying warrants set forth opposite its name below:

<b>Underwriters</b>	<b>Number of Shares of Common Stock and Accompanying Warrants</b>
Oppenheimer & Co. Inc.	
<b>Total</b>	

The underwriters have agreed to purchase all of the shares of common stock and accompanying warrants offered by this prospectus supplement if any are purchased.

The securities offered hereby are expected to be ready for delivery on or about \_\_\_\_\_, 2020 against payment in immediately available funds.

The underwriters are offering the securities subject to various conditions and may reject all or part of any order. The representative of the underwriters has advised us that the underwriters propose initially to offer the securities to the public at the public offering price set forth on the cover page of this prospectus supplement and to dealers at a price less a concession not in excess of \$ \_\_\_\_\_ per share and accompanying warrant to brokers and dealers. After the securities are released for sale to the public, the representative may change the offering price, the concession, and other selling terms at various times.

The following table provides information regarding the amount of the discounts and commissions to be paid to the underwriters by us, before expenses:

	<b>Per Share and Accompanying Warrant</b>	<b>Total Shares and Accompanying Warrants</b>
Public offering price	\$ _____	\$ _____
Underwriting discounts and commissions <sup>(1)</sup>	\$ _____	\$ _____
Proceeds, before expenses, to us	\$ _____	\$ _____

(1) We have agreed to pay the underwriters a commission of \_\_\_\_\_ % of the gross proceeds raised in the offering.

We estimate that our total expenses of the offering, excluding the estimated underwriting discounts and commissions, will be approximately \$ \_\_\_\_\_, which includes the fees and expenses for which we have agreed to reimburse the underwriters, including fees and expenses of their counsel, up to a maximum aggregate amount of \$75,000.

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## Table of Contents

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act of 1933.

We have agreed to a 60-day and our officers and directors have agreed to a 90-day “lock-up” with respect to our shares and our securities that they beneficially own, including securities that are convertible into shares of common stock and securities that are exchangeable for or exercisable into shares of common stock. This means that, subject to certain exceptions, for a period of 60 or 90 days, as applicable, following the date of this prospectus supplement, we and such persons may not offer, sell, pledge or otherwise dispose of these securities without the prior written consent of Oppenheimer & Co. Inc. During such 60-day “lock-up” we are also prohibited from making any sales of our securities pursuant to the ATM Agreement or the Aspire Agreement.

Rules of the SEC may limit the ability of the underwriters to bid for or purchase securities before the distribution of the securities is completed. However, the underwriters may engage in the following activities in accordance with the rules:

- **Stabilizing transactions** — The representative may make bids or purchases for the purpose of pegging, fixing or maintaining the price of the shares of common stock, so long as stabilizing bids do not exceed a specified maximum.
- **Syndicate covering transactions** — The underwriters may sell more shares in connection with this offering than the number of shares that they have committed to purchase. This over-allotment creates a short position for the underwriters. This short sales position may involve either “covered” short sales or “naked” short sales. Covered short sales are short sales made in an amount not greater than the underwriters’ over-allotment option to purchase additional shares, if applicable. The underwriters may close out any covered short position either by exercising their over-allotment option, if applicable, or by purchasing shares in the open market. To determine how they will close the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market, as compared to the price at which they may purchase shares through the over-allotment option, if applicable. Naked short sales are short sales in excess of the over-allotment option, if applicable. The underwriters must close out any naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that, in the open market after pricing, there may be downward pressure on the price of the shares that could adversely affect investors who purchase shares in this offering.
- **Penalty bids** — If the representative purchases shares in the open market in a stabilizing transaction or syndicate covering transaction, it may reclaim a selling concession from the underwriters and selling group members who sold those shares as part of this offering.
- **Passive market making** — Market makers in the shares of common stock who are underwriters or prospective underwriters may make bids for or purchases of shares, subject to limitations, until the time, if ever, at which a stabilizing bid is made.

Similar to other purchase transactions, the underwriters’ purchases to cover the syndicate short sales or to stabilize the market price of our shares may have the effect of raising or maintaining the market price of our shares or preventing or mitigating a decline in the market price of our shares. As a result, the price of the shares of our common stock may be higher than the price that might otherwise exist in the open market. The imposition of a penalty bid might also have an effect on the price of the shares if it discourages resales of the shares.

Neither we nor the underwriters make any representation or prediction as to the effect that the transactions described above may have on the price of the shares or value of the accompanying warrants. These transactions may occur on The Nasdaq Capital Market or otherwise. If such transactions are commenced, they may be discontinued without notice at any time.

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## Table of Contents

### **Electronic Delivery of Preliminary Prospectus**

A prospectus supplement in electronic format may be delivered to potential investors by one or more of the underwriters participating in this offering. The prospectus supplement in electronic format will be identical to the paper version of such prospectus supplement. Other than the prospectus supplement in electronic format, the information on any underwriter's website and any information contained in any other website maintained by an underwriter is not part of this prospectus supplement, the accompanying prospectus or the registration statement of which this prospectus supplement and the accompanying prospectus form a part.

### **Notice to Non-U.S. Investors**

#### ***Belgium***

The offering is exclusively conducted under applicable private placement exemptions and therefore it has not been and will not be notified to, and this document or any other offering material relating to the securities has not been and will not be approved by, the Belgian Banking, Finance and Insurance Commission ("Commission bancaire, financière et des assurances/Commissie voor het Bank, Financie en Assurantiewezen"). Any representation to the contrary is unlawful.

Each underwriter has undertaken not to offer sell, resell, transfer or deliver directly or indirectly, any securities, or to take any steps relating/ancillary thereto, and not to distribute or publish this document or any other material relating to the securities or to the offering in a manner which would be construed as: (a) a public offering under the Belgian Royal Decree of 7 July 1999 on the public character of financial transactions; or (b) an offering of securities to the public under Directive 2003/71/EC which triggers an obligation to publish a prospectus in Belgium. Any action contrary to these restrictions will cause the recipient and the company to be in violation of the Belgian securities laws.

#### ***Canada***

This document constitutes an "exempt offering document" as defined in and for the purposes of applicable Canadian securities laws. No prospectus has been filed with any securities commission or similar regulatory authority in Canada in connection with the offer and sale of the securities described herein (the "Securities"). No securities commission or similar regulatory authority in Canada has reviewed or in any way passed upon this document or on the merits of the Securities and any representation to the contrary is an offence.

Canadian investors are advised that this document has been prepared in reliance on section 3A.3 of National Instrument 33-105 Underwriting Conflicts ("NI 33-105"). Pursuant to section 3A.3 of NI 33-105, this document is exempt from the requirement to provide investors with certain conflicts of interest disclosure pertaining to "connected issuer" and/or "related issuer" relationships as would otherwise be required pursuant to subsection 2.1(1) of NI 33-105.

#### ***Resale Restrictions***

The offer and sale of the securities in Canada is being made on a private placement basis only and is exempt from the requirement to prepare and file a prospectus under applicable Canadian securities laws. Any resale of Securities acquired by a Canadian investor in this offering must be made in accordance with applicable Canadian securities laws, which may vary depending on the relevant jurisdiction, and which may require resales to be made in accordance with Canadian prospectus requirements, a statutory exemption from the prospectus requirements, in a transaction exempt from the prospectus requirements or otherwise under a discretionary exemption from the prospectus requirements granted by the applicable local Canadian securities regulatory authority. These resale restrictions may under certain circumstances apply to resales of the Securities outside of Canada.

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## Table of Contents

### *Representations of Purchasers*

Each Canadian investor who purchases the Securities will be deemed to have represented to the issuer and to each dealer from whom a purchase confirmation is received, as applicable, that the investor (i) is purchasing as principal, or is deemed to be purchasing as principal in accordance with applicable Canadian securities laws, for investment only and not with a view to resale or redistribution; (ii) is an “accredited investor” as such term is defined in section 1.1 of National Instrument 45-106 *Prospectus Exemptions* (“NI 45-106”) or, in Ontario, as such term is defined in section 73.3(1) of the *Securities Act* (Ontario); and (iii) is a “permitted client” as such term is defined in section 1.1 of National Instrument 31-103 *Registration Requirements, Exemptions and Ongoing Registrant Obligations*.

### *Taxation and Eligibility for Investment*

Any discussion of taxation and related matters contained in this document does not purport to be a comprehensive description of all of the tax considerations that may be relevant to a Canadian investor when deciding to purchase the Securities and, in particular, does not address any Canadian tax considerations. No representation or warranty is hereby made as to the tax consequences to a resident, or deemed resident, of Canada of an investment in the Securities or with respect to the eligibility of the Securities for investment by such investor under relevant Canadian federal and provincial legislation and regulations.

### *Rights of Action for Damages or Rescission*

Securities legislation in certain of the Canadian jurisdictions provides certain purchasers of securities pursuant to an offering memorandum, including where the distribution involves an “eligible foreign security” as such term is defined in Ontario Securities Commission Rule 45-501 *Ontario Prospectus and Registration Exemptions* and in Multilateral Instrument 45-107 *Listing Representation and Statutory Rights of Action Disclosure Exemptions*, as applicable, with a remedy for damages or rescission, or both, in addition to any other rights they may have at law, where the offering memorandum, or other offering document that constitutes an offering memorandum, and any amendment thereto, contains a “misrepresentation” as defined under applicable Canadian securities laws. These remedies, or notice with respect to these remedies, must be exercised or delivered, as the case may be, by the purchaser within the time limits prescribed under, and are subject to limitations and defences under, applicable Canadian securities legislation. In addition, these remedies are in addition to and without derogation from any other right or remedy available at law to the investor.

### *Language of Documents*

Upon receipt of this document, each Canadian investor hereby confirms that it has expressly requested that all documents evidencing or relating in any way to the sale of the securities described herein (including for greater certainty any purchase confirmation or any notice) be drawn up in the English language only. *Par la réception de ce document, chaque investisseur canadien confirme par les présentes qu’il a expressément exigé que tous les documents faisant foi ou se rapportant de quelque manière que ce soit à la vente des valeurs mobilières décrites aux présentes (incluant, pour plus de certitude, toute confirmation d’achat ou tout avis) soient rédigés en anglais seulement.*

### *France*

Neither this prospectus supplement nor any other offering material relating to the securities has been submitted to the clearance procedures of the Autorité des marchés financiers in France. The securities have not been offered or sold and will not be offered or sold, directly or indirectly, to the public in France. Neither this prospectus supplement nor any other offering material relating to the securities has been or will be: (a) released, issued, distributed or caused to be released, issued or distributed to the public in France; or (b) used in connection with any offer for subscription or sale of the securities to the public in France. Such offers, sales and distributions

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## Table of Contents

will be made in France only: (i) to qualified investors (investisseurs qualifiés) and/or to a restricted circle of investors (cercle restreint d'investisseurs), in each case investing for their own account, all as defined in and in accordance with Articles L.411-2, D.411-1, D.411-2, D.734-1, D.744-1, D.754-1 and D.764-1 of the French Code monétaire et financier; (ii) to investment services providers authorised to engage in portfolio management on behalf of third parties; or (iii) in a transaction that, in accordance with article L.411-2-II-1° -or-2° -or 3° of the French Code monétaire et financier and article 211-2 of the General Regulations (Règlement Général) of the Autorité des marchés financiers, does not constitute a public offer (appel public à l'épargne). Such shares may be resold only in compliance with Articles L.411-1, L.411-2, L.412-1 and L.621-8 through L.621-8-3 of the French Code monétaire et financier.

### *Israel*

This document does not constitute a prospectus under the Israeli Securities Law, 5728-1968 (the "Securities Law"), and has not been filed with or approved by the Israel Securities Authority. In the State of Israel, this document is being distributed only to, and is directed only at, and any offer of the securities is directed only at, investors listed in the first addendum to the Israeli Securities Law (the "Addendum"), consisting primarily of joint investment in trust funds, provident funds, insurance companies, banks, portfolio managers, investment advisors, members of the Tel Aviv Stock Exchange, underwriters, venture capital funds, entities with equity in excess of NIS 50 million and "qualified individuals", each as defined in the Addendum (as it may be amended from time to time), collectively referred to as qualified investors (in each case purchasing for their own account or, where permitted under the Addendum, for the accounts of their clients who are investors listed in the Addendum). Qualified investors will be required to submit written confirmation that they fall within the scope of the Addendum, are aware of the meaning of same and agree to it.

### *Italy*

The offering of the securities offered hereby in Italy has not been registered with the Commissione Nazionale per la Società e la Borsa ("CONSOB") pursuant to Italian securities legislation and, accordingly, the securities offered hereby cannot be offered, sold or delivered in the Republic of Italy ("Italy") nor may any copy of this prospectus supplement or any other document relating to the shares offered hereby be distributed in Italy other than to professional investors (operatori qualificati) as defined in Article 31, second paragraph, of CONSOB Regulation No. 11522 of 1 July, 1998 as subsequently amended. Any offer, sale or delivery of the securities offered hereby or distribution of copies of this prospectus supplement or any other document relating to the securities offered hereby in Italy must be made:

- (a) by an investment firm, bank or intermediary permitted to conduct such activities in Italy in accordance with Legislative Decree No. 58 of 24 February 1998 and Legislative Decree No. 385 of 1 September 1993 (the "Banking Act");
- (b) in compliance with Article 129 of the Banking Act and the implementing guidelines of the Bank of Italy; and
- (c) in compliance with any other applicable laws and regulations and other possible requirements or limitations which may be imposed by Italian authorities.

### *Sweden*

This prospectus supplement has not been nor will it be registered with or approved by Finansinspektionen (the Swedish Financial Supervisory Authority). Accordingly, this prospectus supplement may not be made available, nor may the securities offered hereunder be marketed and offered for sale in Sweden, other than under circumstances which are deemed not to require a prospectus under the Financial Instruments Trading Act (1991: 980).

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## Table of Contents

### *Switzerland*

The securities offered pursuant to this prospectus supplement will not be offered, directly or indirectly, to the public in Switzerland and this prospectus supplement does not constitute a public offering prospectus as that term is understood pursuant to art. 652a or art. 1156 of the Swiss Federal Code of Obligations. The company has not applied for a listing of the securities being offered pursuant to this prospectus supplement on the SWX Swiss Exchange or on any other regulated securities market, and consequently, the information presented in this prospectus supplement does not necessarily comply with the information standards set out in the relevant listing rules. The securities being offered pursuant to this prospectus supplement have not been registered with the Swiss Federal Banking Commission as foreign investment funds, and the investor protection afforded to acquirers of investment fund certificates does not extend to acquirers of securities.

Investors are advised to contact their legal, financial or tax advisers to obtain an independent assessment of the financial and tax consequences of an investment in securities.



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[Table of Contents](#)

**LEGAL MATTERS**

The validity of the securities offered by this prospectus supplement and the accompanying prospectus will be passed upon for us by Cooley LLP, Broomfield, Colorado. Certain legal matters in connection with the offering will be passed upon for the underwriters by Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., New York, New York.

**EXPERTS**

The consolidated financial statements of Miragen Therapeutics, Inc. as of December 31, 2018 and 2017, and for the years then ended, and for each of the years in the three-year period ended December 31, 2018, have been incorporated by reference herein and in the registration statement in reliance upon the reports of KPMG LLP, independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

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## Table of Contents

### WHERE YOU CAN FIND ADDITIONAL INFORMATION

We file annual, quarterly and other reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at [www.sec.gov](http://www.sec.gov). Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, including any amendments to those reports, and other information that we file with or furnish to the SEC pursuant to Section 13(a) or 15(d) of the Exchange Act can also be accessed free of charge through the Internet. These filings will be available as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC.

We have filed with the SEC a registration statement under the Securities Act of 1933, as amended, relating to the offering of these securities. The registration statement, including the attached exhibits, contains additional relevant information about us and the securities. This prospectus supplement does not contain all of the information set forth in the registration statement. You can obtain a copy of the registration statement from the SEC at the address listed above. The registration statement and the documents referred to below under "Incorporation of Certain Information by Reference" are also available on our website, [www.miragen.com](http://www.miragen.com). We have not incorporated by reference into this prospectus supplement or the accompanying prospectus the information on our website, and you should not consider it to be a part of this prospectus supplement or the accompanying prospectus.

### INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" the information we file with it, which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus supplement and accompanying prospectus. The information incorporated by reference is considered to be part of this prospectus supplement and accompanying prospectus, and later information that we file with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below that we have filed with the SEC (Commission File No. 001-36483) and any future filings (including those made after the date of the initial filing of the registration statement of which this prospectus supplement and accompanying prospectus is a part and prior to the effectiveness of such registration statement) we will make with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act until the termination of the offering of the securities covered by this prospectus supplement and accompanying prospectus (other than information furnished under Item 2.02 or Item 7.01 of Form 8-K):

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2018 (filed with the SEC on March 14, 2019);
- our Quarterly Reports on Form 10-Q for the quarters ended [March 31, 2019 \(filed with the SEC on May 9, 2019\)](#), [June 30, 2019 \(filed with the SEC on August 8, 2019\)](#) and [September 30, 2019 \(filed with the SEC on November 8, 2019\)](#);
- our Current Reports on Form 8-K and any amendments thereto (excluding any reports or portions thereof that are deemed to be furnished and not filed) filed with the SEC on the following dates: [January 10, 2019](#), [January 24, 2019](#), [February 8, 2019](#), [April 26, 2019](#), [April 29, 2019](#), [May 21, 2019](#), [June 21, 2019](#), [July 19, 2019](#), [August 7, 2019](#), [October 16, 2019](#), [October 31, 2019](#), [December 11, 2019](#) and [January 30, 2020](#); and
- the description of our common stock contained in our registration statement on [Form 8-A](#) filed with the SEC on June 6, 2014, including any amendments thereto or reports filed for the purposes of updating this description.

Any statement contained in this prospectus supplement or the accompanying prospectus or in a document incorporated or deemed to be incorporated by reference into this prospectus supplement or in the accompanying prospectus will be deemed to be modified or superseded for purposes of this prospectus supplement and the

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## Table of Contents

accompanying prospectus to the extent that a statement contained in this prospectus supplement or the accompanying prospectus or any other subsequently filed document that is deemed to be incorporated by reference into this prospectus supplement or the accompanying prospectus modifies or supersedes the statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus supplement or the accompanying prospectus.

You should rely only on information contained in, or incorporated by reference into, this prospectus supplement and the accompanying prospectus. We have not authorized anyone to provide you with information different from that contained in this prospectus supplement or the accompanying prospectus or incorporated by reference in this prospectus supplement or the accompanying prospectus.

You can request a copy of these filings, at no cost, by writing or telephoning us at the following address or telephone number:

Miragen Therapeutics, Inc.  
6200 Lookout Road  
Boulder, CO 80301  
Attn: Investor Relations  
Tel: (720) 643-5200  
Email: [investorrelations@miragen.com](mailto:investorrelations@miragen.com)

PROSPECTUS

**\$250,000,000**



**Common Stock  
Preferred Stock  
Debt Securities  
Warrants**

From time to time, we may offer and sell up to \$250,000,000 of any combination of the securities described in this prospectus. We may also offer securities as may be issuable upon conversion, redemption, exchange or exercise of any securities registered pursuant to this prospectus.

This prospectus provides a general description of securities we may offer. Each time we offer and sell securities, we will provide the specific terms of the securities offered in a supplement to this prospectus. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus. You should carefully read this prospectus, any applicable prospectus supplement and any related free writing prospectus, as well as the documents incorporated by reference, before buying any of the securities being offered.

**This prospectus may not be used to consummate a sale of any securities unless accompanied by a prospectus supplement.**

Our common stock is listed on The NASDAQ Capital Market under the symbol "MGEN." On March 30, 2017, the last reported sale price of our common stock on The NASDAQ Capital Market was \$11.99 per share. Any applicable prospectus supplement will contain information, as applicable, as to other listings, if any, on The NASDAQ Capital Market or other securities exchange of the securities covered by the prospectus supplement.

We may sell these securities to or through underwriters or dealers, directly to purchasers or through agents designated from time to time. For additional information on the methods of sale, you should refer to the discussion under the heading "Plan of Distribution" in this prospectus and in any applicable prospectus supplement. If any underwriters are involved in the sale of any securities with respect to which this prospectus is being delivered, the names of such underwriters and any applicable discounts or commissions and over-allotment options will be set forth in a prospectus supplement. The price to the public of such securities and the net proceeds we expect to receive from such sale will also be set forth in a prospectus supplement.

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings.

**Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading "[Risk Factors](#)" contained in any applicable prospectus supplement and in any free writing prospectuses we have authorized for use in connection with a specific offering, and under similar headings in the other documents that are incorporated by reference into this prospectus.**

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.**

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Table of Contents

TABLE OF CONTENTS

	<u>Page</u>
<u>ABOUT THIS PROSPECTUS</u>	i
<u>SUMMARY</u>	1
<u>THE SECURITIES WE MAY OFFER</u>	4
<u>RISK FACTORS</u>	7
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	8
<u>USE OF PROCEEDS</u>	10
<u>RATIO OF EARNING TO FIXED CHARGES</u>	11
<u>DESCRIPTION OF CAPITAL STOCK</u>	12
<u>DESCRIPTION OF DEBT SECURITIES</u>	17
<u>DESCRIPTION OF WARRANTS</u>	24
<u>LEGAL OWNERSHIP OF SECURITIES</u>	27
<u>PLAN OF DISTRIBUTION</u>	31
<u>LEGAL MATTERS</u>	33
<u>EXPERTS</u>	33
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	33
<u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u>	34

---

## Table of Contents

### ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or SEC, using a “shelf” registration process. Under this shelf registration statement, we may sell any combination of the securities described in this prospectus in one or more offerings up to a total aggregate offering price of \$250,000,000. This prospectus provides you with a general description of the securities we may offer.

Each time we sell any type or series of securities under this prospectus, we will provide a prospectus supplement that will contain more specific information about the terms of that offering. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. We may also add, update or change in a prospectus supplement or free writing prospectus any of the information contained in this prospectus or in the documents we have incorporated by reference into this prospectus. This prospectus, together with any applicable prospectus supplement, any related free writing prospectus and the documents incorporated by reference into this prospectus and any applicable prospectus supplement, will include all material information relating to the applicable offering. You should carefully read both this prospectus and any applicable prospectus supplement and any related free writing prospectus, together with the additional information described under “Where You Can Find More Information,” before buying any of the securities being offered.

#### **THIS PROSPECTUS MAY NOT BE USED TO CONSUMMATE A SALE OF SECURITIES UNLESS IT IS ACCOMPANIED BY A PROSPECTUS SUPPLEMENT.**

You should rely only on the information contained in, or incorporated by reference into, this prospectus and any applicable prospectus supplement, along with the information contained in any free writing prospectuses we have authorized for use in connection with a specific offering. We have not authorized anyone to provide you with different information. We are not making an offer to sell or seeking an offer to buy securities under this prospectus or any applicable prospectus supplement and any related free writing prospectus in any jurisdiction where the offer or sale is not permitted. The information contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus, and the documents incorporated by reference herein and therein, are accurate only as of their respective dates, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security.

This prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the heading “Where You Can Find More Information.”

This prospectus incorporates by reference, and any prospectus supplement or free writing prospectus may contain and incorporate by reference, industry, statistical and market data from our own internal estimates and research as well as from industry and general publications and research, surveys and studies conducted by third parties. Industry publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that each of these studies and publications is reliable, we have not independently verified statistical, market and industry data from third-party sources. While we believe our internal company research is reliable and the market definitions are appropriate, neither such research nor these definitions have been verified by any independent source.

This prospectus and the information incorporated herein by reference include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus, any applicable prospectus supplement or any related free writing prospectus are the property of their respective owners.

## Table of Contents

### SUMMARY

*This summary highlights selected information contained elsewhere in this prospectus or incorporated by reference herein and does not contain all the information that may be important to purchasers of our securities. Prospective purchasers of our securities should carefully read the entire prospectus, any applicable prospectus supplement and any related free writing prospectus, including the risks of investing in our securities discussed under the heading “Risk Factors” contained in any applicable prospectus supplement and any related free writing prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus. Prospective purchasers of our securities should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part.*

*Except as otherwise indicated herein or as the context otherwise requires, references in this prospectus to “Miragen,” “the Company,” “we,” “us,” “our” and similar references refer to Miragen Therapeutics, Inc. and its consolidated subsidiaries.*

#### **Company Overview**

We are a clinical-stage biopharmaceutical company discovering and developing proprietary RNA-targeted therapeutics with a specific focus on microRNAs and their role in diseases where there is a high unmet medical need. microRNAs are short RNA molecules, or oligonucleotides, that regulate gene expression or activity and play a vital role in influencing the pathways responsible for many disease processes. We believe our experience in microRNA biology and chemistry, drug discovery, bioinformatics, and translational medicine provide it with a potential competitive advantage to identify and develop microRNA-targeted drugs designed to regulate gene pathways to result in disease modification. We use our expertise in systems biology and oligonucleotide chemistry to discover and develop a pipeline of product candidates. Our two lead product candidates, MRG-106 and MRG-201, are currently in Phase 1 clinical trials. Our clinical product candidate for the treatment of certain cancers, MRG-106, is an inhibitor of microRNA-155, or miR-155, which is found at abnormally high levels in several blood cancers. Our clinical product candidate for the treatment of pathological fibrosis, MRG-201, is a replacement for miR-29, which is found at abnormally low levels in a number of pathological fibrotic conditions, including cardiac, renal, hepatic, and pulmonary fibrosis, as well as systemic sclerosis. In addition to our clinical programs, we continue to discover and develop a pipeline of pre-clinical product candidates. The goal of our translational medicine strategy is to progress rapidly to first in human studies once it has established the pharmacokinetics (the movement of drug into, through, and out of the body), pharmacodynamics (the effect and mechanism of action of a drug), safety and manufacturability of the product candidate in preclinical studies.

#### **Risk Factors**

Investment in our securities is subject to various risks associated with our business and our industry, including the following risks:

- We have incurred losses since our inception, have a limited operating history on which to assess our business, and anticipate that we will continue to incur significant losses for the foreseeable future.
- We have never generated any revenue from product sales and may never be profitable.
- Raising additional capital may cause dilution to our stockholders, restrict our operations or require us to relinquish rights.
- We may be unsuccessful in maintaining orphan-drug designation for our product candidates because even after an orphan drug is approved, the FDA can subsequently approve a different drug for the same indication if the FDA concludes that the later drug is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care.

## Table of Contents

- Clinical trials are costly, time consuming and inherently risky, and we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.
- The approach we are taking to discover and develop novel therapeutics using microRNA is unproven and may never lead to marketable products.
- Our microRNA therapeutic product candidates are based on a relatively novel technology, which makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval, if at all. To date, no microRNA therapeutics have been approved for marketing in the United States.
- We may not be able to develop or identify technology that can effectively deliver MRG-106, MRG-201 or any other of our micro-RNA-targeted product candidates to the intended diseased cells or tissues, and any failure in such delivery technology could adversely affect and delay the development of MRG-106, MRG-201 and our other product candidates.
- Our product candidates may cause undesirable side effects or have other properties that could delay or prevent the regulatory approval, limit the commercial viability of an approved label, or result in significant negative consequences following marketing approval, if any.
- We are heavily dependent on the success of our product candidates, which are in the early stages of clinical development. Some of our product candidates have produced results only in pre-clinical settings, or for other indications than those for which we contemplate conducting development and seeking FDA approval, and we cannot give any assurance that we will generate data for any of our product candidates sufficiently supportive to receive regulatory approval in our planned indications, which will be required before they can be commercialized.
- We may use our financial and human resources to pursue a particular research program or product candidate and fail to capitalize on programs or product candidates that may be more profitable or for which there is a greater likelihood of success.
- We face substantial competition and our competitors may discover, develop or commercialize products faster or more successfully than us.
- We may be unable to realize the potential benefits of any collaboration.
- We may attempt to form collaborations in the future with respect to our product candidates, but we may not be able to do so, which may cause us to alter our development and commercialization plans.
- If equity research analysts do not publish research or reports, or publish unfavorable research or reports, about us, our business or our market, our stock price and trading volume could decline.

These risks and other risks are discussed in greater detail under the section titled “Risk Factors” in this prospectus and in any applicable prospectus supplement and any related free writing prospectus, and discussed under the heading “Risk Factors” contained in our most recent Annual Report on Form 10-K, as may be updated by subsequent annual, quarterly and other reports that are incorporated by reference into this prospectus in their entirety. We encourage you to read and consider all of these risks carefully.

### **Corporate Information**

We were founded in New York as a Delaware limited liability company in January 2010 under the name Myeloma Health LLC. Signal Genetics LLC was formed as a Delaware limited liability company in December 2010. Effective January 1, 2011, substantially all of the member interests in Myeloma Health LLC were exchanged for member interests in Signal Genetics LLC and Myeloma Health LLC became a subsidiary of Signal Genetics LLC. Immediately prior to the pricing of our initial public offering, on June 17, 2014, Signal



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## Table of Contents

Genetics LLC converted from a Delaware limited liability company to a Delaware corporation, or the Corporate Conversion. In connection with the Corporate Conversion, each unit of Signal Genetics LLC was converted into a share of our common stock, the members of Signal Genetics LLC became our stockholders and we succeeded to the business of Signal Genetics LLC and its consolidated subsidiaries. On February 13, 2017, we acquired a privately-held company named Miragen Therapeutics, Inc., and immediately following the acquisition, we changed our name to “Miragen Therapeutics, Inc.”, which we refer to as the Merger. In connection with the closing of the Merger, we issued 20,567,147 shares of our common stock. Our common stock began trading on The NASDAQ Capital Market under the ticker symbol “MGEN” on February 14, 2017.

Our principal executive office is located at 6200 Lookout Road, Boulder, CO 80301, and our telephone number is (303) 531-5952. Our corporate website address is [www.miragentherapeutics.com](http://www.miragentherapeutics.com). The contents of our website are not incorporated into this prospectus and our reference to the URL for our website is intended to be an inactive textual reference only.

### **Implications of Being an Emerging Growth Company**

We are an “emerging growth company,” as defined in the JOBS Act. We will remain an emerging growth company until the earlier of (1) the beginning of the first fiscal year following the fifth anniversary of our initial public offering, or June 17, 2019, (2) the beginning of the first fiscal year after our annual gross revenue is \$1.0 billion or more, (3) the date on which we have, during the previous three-year period, issued more than \$1.0 billion in non-convertible debt securities and (4) as of the end of any fiscal year in which the market value of our common stock held by non-affiliates exceeded \$700 million as of the end of the second quarter of that fiscal year.

For as long as we remain an “emerging growth company,” we may take advantage of certain exemptions from various reporting requirements that are applicable to public companies that are not “emerging growth companies” including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation and financial statements in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote to approve executive compensation and shareholder approval of any golden parachute payments not previously approved. We will take advantage of these reporting exemptions until we are no longer an “emerging growth company.”

## Table of Contents

### **The Securities We May Offer**

We may offer shares of our common stock and preferred stock, various series of debt securities, and/or warrants to purchase any of such securities, either individually or in combination, up to a total dollar amount of \$250,000,000, from time to time in one or more offerings. This prospectus provides you with a general description of the securities we may offer. Each time we offer a type or series of securities under this prospectus, we will provide a prospectus supplement that will describe the specific amounts, prices and other important terms of the securities, including, to the extent applicable:

- designation or classification;
- aggregate principal amount or aggregate offering price;
- maturity;
- original issue discount;
- rates and times of payment of interest or dividends;
- redemption, conversion, exercise, exchange or sinking fund terms;
- ranking;
- restrictive covenants;
- voting or other rights;
- conversion or exchange prices or rates and, if applicable, any provisions for changes to or adjustments in the conversion or exchange prices or rates and in the securities or other property receivable upon conversion or exchange; and
- material or special U.S. federal income tax considerations.

Any applicable prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change any of the information contained in this prospectus or in the documents we have incorporated by reference. However, no prospectus supplement or free writing prospectus will offer a security that is not registered and described in this prospectus at the time of the effectiveness of the registration statement of which this prospectus is a part.

**This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.**

We may sell the securities directly to investors or to or through agents, underwriters or dealers. We and our agents, underwriters or dealers reserve the right to accept or reject all or part of any proposed purchase of securities. If we offer securities to or through agents, underwriters or dealers, any applicable prospectus supplement will include:

- the names of those agents, underwriters or dealers;
- applicable fees, discounts and commissions to be paid to them;
- details regarding over-allotment or other options, if any; and
- the estimated net proceeds to us, if any.

### **Common Stock**

We may issue shares of our common stock from time to time. Each holder of our common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, except on matters relating solely

## Table of Contents

to terms of preferred stock. Under our certificate of incorporation, as amended, or certificate of incorporation, and amended and restated bylaws, as amended, or bylaws, our stockholders do not have cumulative voting rights. Because of this, the holders of a majority of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose. Subject to preferences that may be applicable to any then-outstanding preferred stock, holders of common stock are entitled to receive ratably those dividends, if any, as may be declared from time to time by the board of directors out of legally available funds. In the event of our liquidation, dissolution or winding up, holders of common stock are entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares of preferred stock. Holders of common stock have no preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate in the future. In this prospectus, we have summarized certain general features of the common stock under “Description of Capital Stock — Common Stock.” We urge you, however, to read any applicable prospectus supplement (and any related free writing prospectus that we may authorize to be provided to you) related to any common stock being offered.

### **Preferred Stock**

We may issue shares of our preferred stock from time to time, in one or more series. Our board of directors will determine the designations, voting powers, preferences and rights of the preferred stock, as well as the qualifications, limitations or restrictions thereof, including dividend rights, conversion rights, preemptive rights, terms of redemption or repurchase, liquidation preferences, sinking fund terms and the number of shares constituting any series or the designation of any series. Convertible preferred stock will be convertible into or exchangeable for our common stock or other securities. Conversion may be mandatory or at your option and would be at prescribed conversion rates.

If we sell any series of preferred stock under this prospectus, we will fix the designations, voting powers, preferences and rights of such series of preferred stock, as well as the qualifications, limitations or restrictions thereof, in the certificate of designation relating to that series. We will file as an exhibit to the registration statement of which this prospectus is a part, or will incorporate by reference from reports that we file with the SEC, the form of any certificate of designation that describes the terms of the series of preferred stock that we are offering before the issuance of the related series of preferred stock. In this prospectus, we have summarized certain general features of the preferred stock under “Description of Capital Stock – Preferred Stock.” We urge you, however, to read any applicable prospectus supplement (and any related free writing prospectus that we may authorize to be provided to you) related to the series of preferred stock being offered, as well as the complete certificate of designation that contains the terms of the applicable series of preferred stock.

### **Debt Securities**

We may issue debt securities from time to time, in one or more series, as either senior or subordinated debt or as senior or subordinated convertible debt. The senior debt securities will rank equally with any other unsecured and unsubordinated debt. The subordinated debt securities will be subordinate and junior in right of payment, to the extent and in the manner described in the instrument governing the debt, to all of our senior indebtedness. Convertible debt securities will be convertible into or exchangeable for our common stock or preferred stock. Conversion may be mandatory or at the holder’s option and would be at prescribed conversion rates.

The debt securities will be issued under one or more documents called indentures, which are contracts between us and a national banking association or other eligible party, as trustee. In this prospectus, we have summarized certain general features of the debt securities. We urge you, however, to read any applicable prospectus supplement (and any free writing prospectus that we may authorize to be provided to you) related to

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## Table of Contents

the series of debt securities being offered, as well as the complete indentures that contain the terms of the debt securities. Forms of indentures have been filed as exhibits to the registration statement of which this prospectus is a part, and supplemental indentures and forms of debt securities containing the terms of the debt securities being offered will be filed as exhibits to the registration statement of which this prospectus is a part or will be incorporated by reference from reports that we file with the SEC.

### **Warrants**

We may issue warrants for the purchase of common stock, preferred stock, and/or debt securities in one or more series. We may issue warrants independently or together with common stock, preferred stock, and/or debt securities, and the warrants may be attached to or separate from these securities. In this prospectus, we have summarized certain general features of the warrants. We urge you, however, to read any applicable prospectus supplement (and any free writing prospectus that we may authorize to be provided to you) related to the particular series of warrants being offered, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants. Forms of the warrant agreements and forms of warrant certificates containing the terms of the warrants being offered have been filed as exhibits to the registration statement of which this prospectus is a part, and supplemental warrant agreements and forms of warrant certificates will be filed as exhibits to the registration statement of which this prospectus is a part or will be incorporated by reference from reports that we file with the SEC.

We will evidence each series of warrants by warrant certificates that we will issue. Warrants may be issued under an applicable warrant agreement that we enter into with a warrant agent. We will indicate the name and address of the warrant agent, if applicable, in the prospectus supplement relating to the particular series of warrants being offered.

## **RISK FACTORS**

Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks and uncertainties described under the heading “Risk Factors” contained in any applicable prospectus supplement and any related free writing prospectus, and discussed under the heading “Risk Factors” contained in our most recent Annual Report on Form 10-K, as may be updated by subsequent annual, quarterly and other reports that are incorporated by reference into this prospectus in their entirety. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be adversely affected, which could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the discussion below under the heading “Special Note Regarding Forward-Looking Statements.”

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the documents that we incorporate by reference herein, contains, and any applicable prospectus supplement or free writing prospectus including the documents we incorporate by reference therein may contain, forward-looking statements that involve substantial risks and uncertainties for purposes of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. All statements contained in this prospectus and the documents referenced above, other than statements of historical fact, including statements regarding our strategy, future operations, future financial position, future revenue, projected expenses, prospects, plans and objectives of management are forward-looking statements. The words “believe,” “may,” “will,” “estimate,” “continue,” “anticipate,” “intend,” “plan,” “expect,” “predict,” “potential,” “opportunity,” “goals,” or “should,” and similar expressions are intended to identify forward-looking statements.

Such statements are based on management’s current expectations and involve risks and uncertainties. Actual results and performance could differ materially from those projected in the forward-looking statements as a result of many factors, including, without limitation:

- We have incurred losses since our inception, have a limited operating history on which to assess our business, and anticipate that we will continue to incur significant losses for the foreseeable future.
- We have never generated any revenue from product sales and may never be profitable.
- Raising additional capital may cause dilution to our stockholders, restrict our operations or require us to relinquish rights.
- We may be unsuccessful in maintaining orphan-drug designation for our product candidates because even after an orphan drug is approved, the FDA can subsequently approve a different drug for the same indication if the FDA concludes that the later drug is clinically superior in that it is shown to be safer, more effective or makes a major contribution to patient care.
- Clinical trials are costly, time consuming and inherently risky, and we may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.
- The approach we are taking to discover and develop novel therapeutics using microRNA is unproven and may never lead to marketable products.
- Our microRNA therapeutic product candidates are based on a relatively novel technology, which makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval, if at all. To date, no microRNA therapeutics have been approved for marketing in the United States.
- We may not be able to develop or identify technology that can effectively deliver MRG-106, MRG-201 or any other of our micro-RNA-targeted product candidates to the intended diseased cells or tissues, and any failure in such delivery technology could adversely affect and delay the development of MRG-106, MRG-201 and our other product candidates.
- Our product candidates may cause undesirable side effects or have other properties that could delay or prevent the regulatory approval, limit the commercial viability of an approved label, or result in significant negative consequences following marketing approval, if any.
- We are heavily dependent on the success of our product candidates, which are in the early stages of clinical development. Some of our product candidates have produced results only in pre-clinical settings, or for other indications than those for which we contemplate conducting development and seeking FDA approval, and we cannot give any assurance that we will generate data for any of our product candidates sufficiently supportive to receive regulatory approval in our planned indications, which will be required before they can be commercialized.
- We may use our financial and human resources to pursue a particular research program or product candidate and fail to capitalize on programs or product candidates that may be more profitable or for which there is a greater likelihood of success.

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## Table of Contents

- We face substantial competition and our competitors may discover, develop or commercialize products faster or more successfully than us.
- We may be unable to realize the potential benefits of any collaboration.
- We may attempt to form collaborations in the future with respect to our product candidates, but we may not be able to do so, which may cause us to alter our development and commercialization plans.
- If equity research analysts do not publish research or reports, or publish unfavorable research or reports, about us, our business or our market, our stock price and trading volume could decline.

We have based these forward-looking statements largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described above under the heading “Risk Factors.” Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the future events and trends discussed in this prospectus may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

We undertake no obligation to revise or publicly release the results of any revision to these forward-looking statements, except as required by law. Given these risks and uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements. All forward-looking statements are qualified in their entirety by this cautionary statement.

## USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of the securities offered by this prospectus. Except as described in any applicable prospectus supplement or in any free writing prospectuses we have authorized for use in connection with a specific offering, we currently intend to use the net proceeds from the sale of the securities offered by us hereunder, if any, for working capital and general corporate purposes. We may also use a portion of the net proceeds to invest in or acquire businesses or technologies that we believe are complementary to our own, although we have no current plans, commitments or agreements with respect to any acquisitions as of the date of this prospectus. We will set forth in any applicable prospectus supplement or free writing prospectus our intended use for the net proceeds received from the sale of any securities sold pursuant to any prospectus supplement or free writing prospectus. Pending these uses, we plan to invest these net proceeds in short-term, interest bearing obligations, certificates of deposit or direct or guaranteed obligations of the United States.



**RATIO OF EARNINGS TO FIXED CHARGES**

If we offer debt securities and/or preference equity securities under this prospectus, then we will, if required at that time, provide a ratio of earnings to fixed charges and/or ratio of combined fixed charges and preference dividends to earnings, respectively, in any applicable prospectus supplement for such offering.

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## [Table of Contents](#)

### DESCRIPTION OF CAPITAL STOCK

As of the date of this prospectus, our certificate of incorporation, authorizes us to issue up to 100,000,000 shares of common stock, \$0.01 par value per share, and 5,000,000 shares of preferred stock, \$0.01 par value per share. As of December 31, 2016, 742,293 shares of our common stock were outstanding and no shares of our preferred stock were outstanding. After closing of the Merger on February 13, 2017, we had 21,309,440 shares of our common stock outstanding and no shares of preferred stock outstanding.

The following summary describes the material terms of our capital stock. The description of capital stock is qualified by reference to our certificate of incorporation and our bylaws.

#### **Common Stock**

##### *Voting Rights*

Each holder of our common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, except on matters relating solely to terms of preferred stock. Under our certificate of incorporation and bylaws, our stockholders do not have cumulative voting rights. Because of this, the holders of a majority of the shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they should so choose.

##### *Dividends*

Subject to preferences that may be applicable to any then-outstanding preferred stock, holders of our common stock are entitled to receive ratably those dividends, if any, as may be declared from time to time by our board of directors out of legally available funds.

##### *Liquidation*

In the event of our liquidation, dissolution or winding up, holders of our common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities and the satisfaction of any liquidation preference granted to the holders of any then-outstanding shares of preferred stock.

##### *Rights and Preferences*

Holders of our common stock do not have any preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences and privileges of the holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate in the future.

#### **Preferred Stock**

Under our certificate of incorporation, our board of directors is authorized by resolution to divide the preferred stock into series and, with respect to each series, to determine the designations and the powers, preferences and rights, and the qualifications, limitations and restrictions thereof, including the dividend rights, conversion or exchange rights, voting rights, redemption rights and terms, liquidation preferences, sinking fund provisions and the number of shares constituting the series. Our board of directors can, without stockholder approval, but subject to the terms of the certificate of incorporation, issue preferred stock with voting and other rights that could adversely affect the voting power of the holders of our common stock and which could have certain anti-takeover effects. Before we may issue any series of preferred stock, our board of directors will be required to adopt resolutions creating and designating such series of preferred stock.

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## Table of Contents

The following summary of terms of our preferred stock is not complete. You should refer to the provisions of our certificate of incorporation and bylaws and the resolutions containing the terms of each class or series of the preferred stock which have been or will be filed with the SEC at or prior to the time of issuance of such class or series of preferred stock and described in any applicable prospectus supplement. Any applicable prospectus supplement may also state that any of the terms set forth herein are inapplicable to such series of preferred stock, provided that the information set forth in such prospectus supplement does not constitute material changes to the information herein such that it alters the nature of the offering or the securities offered.

We will fix the designations, voting powers, preferences and rights of the preferred stock of each series we issue under this prospectus, as well as the qualifications, limitations or restrictions thereof, in the certificate of designation relating to that series. We will file as an exhibit to the registration statement of which this prospectus is a part, or will incorporate by reference from reports that we file with the SEC, the form of any certificate of designation that describes the terms of the series of preferred stock we are offering. We will describe in any applicable prospectus supplement the terms of the series of preferred stock being offered, including, to the extent applicable:

- the title and stated value;
- the number of shares we are offering;
- the liquidation preference per share;
- the purchase price;
- the dividend rate, period and payment date and method of calculation for dividends;
- whether dividends will be cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;
- the procedures for any auction and remarketing;
- the provisions for a sinking fund;
- the provisions for redemption or repurchase and any restrictions on our ability to exercise those redemption and repurchase rights;
- any listing of the preferred stock on any securities exchange or market;
- whether the preferred stock will be convertible into our common stock, and the conversion rate or conversion price, or how they will be calculated, and the conversion period;
- whether the preferred stock will be exchangeable into debt securities, and the exchange rate or exchange price, or how they will be calculated, and the exchange period;
- voting rights of the preferred stock;
- preemptive rights;
- restrictions on transfer, sale or other assignment;
- whether interests in the preferred stock will be represented by depositary shares;
- a discussion of material or special U.S. federal income tax considerations applicable to the preferred stock;
- the relative ranking and preferences of the preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs;
- any limitations on the issuance of any class or series of preferred stock ranking senior to or on a parity with the series of preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs; and

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## Table of Contents

- any other specific terms, preferences, rights or limitations of, or restrictions on, the preferred stock.

If we issue shares of preferred stock under this prospectus, the shares will be fully paid and nonassessable.

The issuance of preferred stock could adversely affect the voting power of holders of common stock and reduce the likelihood that common stockholders will receive dividend payments and payments upon liquidation. The issuance could have the effect of decreasing the market price of the common stock. The issuance of preferred stock also could have the effect of delaying, deterring or preventing a change in control of us.

### **Anti-Takeover Provisions**

We are subject to Section 203 of the Delaware General Corporation Law, or Section 203. Section 203 generally prohibits a public Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a period of three years after the date of the transaction in which the person became an interested stockholder, unless:

- prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- the interested stockholder owned at least 85% of the voting stock of the corporation outstanding upon consummation of the transaction, excluding for purposes of determining the number of shares outstanding (i) shares owned by persons who are directors and also officers and (ii) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- on or subsequent to the consummation of the transaction, the business combination is approved by the board and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least  $66\frac{2}{3}\%$  of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, pledge or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;
- subject to exceptions, any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; and
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

### ***Certificate of Incorporation and Bylaws***

Our certificate of incorporation and bylaws provide that:

- the authorized number of directors can be changed only by resolution of our board of directors;
- our bylaws may be amended or repealed by our board of directors or stockholders;

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## Table of Contents

- our stockholders may not call special meetings of the stockholders or fill vacancies on our board of directors;
- our stockholders may remove our directors only for cause;
- all vacancies, including newly created directorships, may, except as otherwise required by law or subject to the rights of holders of preferred stock as designated from time to time, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- our board of directors will be authorized to issue, without stockholder approval, preferred stock, the rights of which will be determined at the discretion of our board of directors and that, if issued, could operate as a “poison pill” to dilute the stock ownership of a potential hostile acquirer to prevent an acquisition that our board of directors does not approve;
- our stockholders do not have cumulative voting rights, and therefore our stockholders holding a majority of the shares of common stock outstanding will be able to elect all of our directors;
- our stockholders must comply with advance notice provisions to bring business before or nominate directors for election at a stockholder meeting; and
- the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employee to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the Delaware General Corporation Law or our certificate of incorporation or bylaws or (4) any action asserting a claim against us governed by the internal affairs doctrine.

### ***Potential Effects of Authorized but Unissued Stock***

Our shares of common stock and preferred stock available for future issuance without stockholder approval. We may utilize these additional shares for a variety of corporate purposes, including future public offerings to raise additional capital, to facilitate corporate acquisitions or payment as a dividend on the capital stock.

The existence of unissued and unreserved common stock and preferred stock may enable our board of directors to issue shares to persons friendly to current management or to issue preferred stock with terms that could render more difficult or discourage a third-party attempt to obtain control by means of a merger, tender offer, proxy contest or otherwise, thereby protecting the continuity of our management. In addition, our board of directors has the discretion to determine designations, rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences of each series of preferred stock, all to the fullest extent permissible under the Delaware General Corporation Law and subject to any limitations set forth in our certificate of incorporation. The purpose of authorizing the board of directors to issue preferred stock and to determine the rights and preferences applicable to such preferred stock is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing desirable flexibility in connection with possible financings, acquisitions and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from acquiring, a majority of our outstanding voting stock.

### ***Amendments to Governing Documents***

Generally, the amendment of our certificate of incorporation requires approval by our board of directors and a majority vote of stockholders. Any amendment to our bylaws requires the approval of either a majority of our board of directors or approval of at least a majority of the votes entitled to be cast by the holders of our outstanding capital stock in elections of our board of directors.

### **Listing**

Our common stock is listed on The NASDAQ Capital Market under the symbol “MGEN.”

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[Table of Contents](#)

**Transfer Agent and Registrar**

The transfer agent and registrar for our common stock is VStock Transfer, LLC. The transfer agent and registrar's address is 18 Lafayette Place, Woodmere, New York 11598.

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[Table of Contents](#)

**DESCRIPTION OF DEBT SECURITIES**

We may issue debt securities from time to time, in one or more series, as either senior or subordinated debt or as senior or subordinated convertible debt. While the terms we have summarized below will apply generally to any debt securities that we may offer under this prospectus, we will describe the particular terms of any debt securities that we may offer in more detail in any applicable prospectus supplement. The terms of any debt securities offered under a prospectus supplement may differ from the terms described below. Unless the context requires otherwise, whenever we refer to the indenture, we also are referring to any supplemental indentures that specify the terms of a particular series of debt securities.

We will issue the debt securities under the indenture that we will enter into with the trustee named in the indenture. The indenture will be qualified under the Trust Indenture Act of 1939, as amended, or the Trust Indenture Act. We have filed the form of indenture as an exhibit to the registration statement of which this prospectus is a part, and supplemental indentures and forms of debt securities containing the terms of the debt securities being offered will be filed as exhibits to the registration statement of which this prospectus is a part or will be incorporated by reference from reports that we file with the SEC.

The following summary of material provisions of the debt securities and the indenture is subject to, and qualified in its entirety by reference to, all of the provisions of the indenture applicable to a particular series of debt securities. We urge you to read any applicable prospectus supplements and any related free writing prospectuses related to the debt securities that we may offer under this prospectus, as well as the complete indenture that contains the terms of the debt securities.

**General**

The indenture does not limit the amount of debt securities that we may issue. It provides that we may issue debt securities up to the principal amount that we may authorize and may be in any currency or currency unit that we may designate. Except for the limitations on consolidation, merger and sale of all or substantially all of our assets contained in the indenture, the terms of the indenture do not contain any covenants or other provisions designed to give holders of any debt securities protection against changes in our operations, financial condition or transactions involving us.

We may issue the debt securities issued under the indenture as “discount securities,” which means they may be sold at a discount below their stated principal amount. These debt securities, as well as other debt securities that are not issued at a discount, may be issued with “original issue discount,” or OID, for U.S. federal income tax purposes because of interest payment and other characteristics or terms of the debt securities. Material U.S. federal income tax considerations applicable to debt securities issued with OID will be described in more detail in any applicable prospectus supplement.

We will describe in any applicable prospectus supplement the terms of the series of debt securities being offered, including:

- the title of the series of debt securities;
- any limit upon the aggregate principal amount that may be issued;
- the maturity date or dates;
- the form of the debt securities of the series;
- the applicability of any guarantees;
- whether or not the debt securities will be secured or unsecured, and the terms of any secured debt;
- whether the debt securities rank as senior debt, senior subordinated debt, subordinated debt or any combination thereof, and the terms of any subordination;

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## Table of Contents

- if the price (expressed as a percentage of the aggregate principal amount thereof) at which such debt securities will be issued is a price other than the principal amount thereof, the portion of the principal amount thereof payable upon declaration of acceleration of the maturity thereof, or if applicable, the portion of the principal amount of such debt securities that is convertible into another security or the method by which any such portion shall be determined;
- the interest rate or rates, which may be fixed or variable, or the method for determining the rate and the date interest will begin to accrue, the dates interest will be payable and the regular record dates for interest payment dates or the method for determining such dates;
- our right, if any, to defer payment of interest and the maximum length of any such deferral period;
- if applicable, the date or dates after which, or the period or periods during which, and the price or prices at which, we may, at our option, redeem the series of debt securities pursuant to any optional or provisional redemption provisions and the terms of those redemption provisions;
- the date or dates, if any, on which, and the price or prices at which we are obligated, pursuant to any mandatory sinking fund or analogous fund provisions or otherwise, to redeem, or at the holder's option to purchase, the series of debt securities and the currency or currency unit in which the debt securities are payable;
- the denominations in which we will issue the series of debt securities, if other than denominations of \$1,000 and any integral multiple thereof;
- any and all terms, if applicable, relating to any auction or remarketing of the debt securities of that series and any security for our obligations with respect to such debt securities and any other terms which may be advisable in connection with the marketing of debt securities of that series;
- whether the debt securities of the series shall be issued in whole or in part in the form of a global security or securities; the terms and conditions, if any, upon which such global security or securities may be exchanged in whole or in part for other individual securities; and the depository for such global security or securities;
- if applicable, the provisions relating to conversion or exchange of any debt securities of the series and the terms and conditions upon which such debt securities will be so convertible or exchangeable, including the conversion or exchange price, as applicable, or how it will be calculated and may be adjusted, any mandatory or optional (at our option or the holders' option) conversion or exchange features, the applicable conversion or exchange period and the manner of settlement for any conversion or exchange;
- if other than the full principal amount thereof, the portion of the principal amount of debt securities of the series which shall be payable upon declaration of acceleration of the maturity thereof;
- additions to or changes in the covenants applicable to the particular debt securities being issued, including, among others, the consolidation, merger or sale covenant;
- additions to or changes in the events of default with respect to the securities and any change in the right of the trustee or the holders to declare the principal, premium, if any, and interest, if any, with respect to such securities to be due and payable;
- additions to or changes in or deletions of the provisions relating to covenant defeasance and legal defeasance;
- additions to or changes in the provisions relating to satisfaction and discharge of the indenture;
- additions to or changes in the provisions relating to the modification of the indenture both with and without the consent of holders of debt securities issued under the indenture;
- the currency of payment of debt securities if other than U.S. dollars and the manner of determining the equivalent amount in U.S. dollars;



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## **Table of Contents**

- whether interest will be payable in cash or additional debt securities at our or the holders' option and the terms and conditions upon which the election may be made;
- the terms and conditions, if any, upon which we will pay amounts in addition to the stated interest, premium, if any, and principal amounts of the debt securities of the series to any holder that is not a "United States person" for federal tax purposes;
- any restrictions on transfer, sale or assignment of the debt securities of the series; and
- any other specific terms, preferences, rights or limitations of, or restrictions on, the debt securities, any other additions or changes in the provisions of the indenture, and any terms that may be required by us or advisable under applicable laws or regulations.

### **Conversion or Exchange Rights**

We will set forth in any applicable prospectus supplement the terms on which a series of debt securities may be convertible into or exchangeable for our common stock or our other securities. We will include provisions as to settlement upon conversion or exchange and whether conversion or exchange is mandatory, at the option of the holder or at our option. We may include provisions pursuant to which the number of shares of our common stock or our other securities that the holders of the series of debt securities receive would be subject to adjustment.

### **Consolidation, Merger or Sale**

Unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, the indenture will not contain any covenant that restricts our ability to merge or consolidate, or sell, convey, transfer or otherwise dispose of our assets as an entirety or substantially as an entirety. However, any successor to or acquirer of such assets (other than a subsidiary of ours) must assume all of our obligations under the indenture or the debt securities, as appropriate.

### **Events of Default under the Indenture**

Unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, the following are events of default under the indenture with respect to any series of debt securities that we may issue:

- if we fail to pay any installment of interest on any series of debt securities, as and when the same shall become due and payable, and such default continues for a period of 90 days; provided, however, that a valid extension of an interest payment period by us in accordance with the terms of any indenture supplemental thereto shall not constitute a default in the payment of interest for this purpose;
- if we fail to pay the principal of, or premium, if any, on any series of debt securities as and when the same shall become due and payable whether at maturity, upon redemption, by declaration or otherwise, or in any payment required by any sinking or analogous fund established with respect to such series; provided, however, that a valid extension of the maturity of such debt securities in accordance with the terms of any indenture supplemental thereto shall not constitute a default in the payment of principal or premium, if any;
- if we fail to observe or perform any other covenant or agreement contained in the debt securities or the indenture, other than a covenant specifically relating to another series of debt securities, and our failure continues for 90 days after we receive written notice of such failure, requiring the same to be remedied and stating that such is a notice of default thereunder, from the trustee or holders of at least 25% in aggregate principal amount of the outstanding debt securities of the applicable series; and
- if specified events of bankruptcy, insolvency or reorganization occur.

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## **Table of Contents**

If an event of default with respect to debt securities of any series occurs and is continuing, other than an event of default specified in the last bullet point above, the trustee or the holders of at least 25% in aggregate principal amount of the outstanding debt securities of that series, by notice to us in writing, and to the trustee if notice is given by such holders, may declare the unpaid principal of, premium, if any, and accrued interest, if any, of such series of debt securities due and payable immediately. If an event of default specified in the last bullet point above occurs with respect to us, the principal amount of and accrued interest, if any, of each issue of debt securities then outstanding shall be due and payable without any notice or other action on the part of the trustee or any holder.

The holders of a majority in principal amount of the outstanding debt securities of an affected series may waive any default or event of default with respect to the series and its consequences, except defaults or events of default regarding payment of principal, premium, if any, or interest, unless we have cured the default or event of default in accordance with the indenture. Any waiver shall cure the default or event of default.

Subject to the terms of the indenture, if an event of default under an indenture shall occur and be continuing, the trustee will be under no obligation to exercise any of its rights or powers under such indenture at the request or direction of any of the holders of the applicable series of debt securities, unless such holders have offered the trustee reasonable indemnity. The holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee, or exercising any trust or power conferred on the trustee, with respect to the debt securities of that series, provided that:

- the direction so given by the holder is not in conflict with any law or the applicable indenture; and
- subject to its duties under the Trust Indenture Act, the trustee need not take any action that might involve it in personal liability or might be unduly prejudicial to the holders not involved in the proceeding.

A holder of the debt securities of any series will have the right to institute a proceeding under the indenture or to appoint a receiver or trustee, or to seek other remedies only if:

- the holder has given written notice to the trustee of a continuing event of default with respect to that series;
- the holders of at least 25% in aggregate principal amount of the outstanding debt securities of that series have made written request,
- such holders have offered to the trustee indemnity satisfactory to it against the costs, expenses and liabilities to be incurred by the trustee in compliance with the request; and
- the trustee does not institute the proceeding, and does not receive from the holders of a majority in aggregate principal amount of the outstanding debt securities of that series other conflicting directions within 90 days after the notice, request and offer.

These limitations do not apply to a suit instituted by a holder of debt securities if we default in the payment of the principal, premium, if any, or interest on, the debt securities.

We will periodically file statements with the trustee regarding our compliance with specified covenants in the indenture.

### **Modification of Indenture; Waiver**

Unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, we and the trustee may change an indenture without the consent of any holders with respect to specific matters:

- to cure any ambiguity, defect or inconsistency in the indenture or in the debt securities of any series;

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## Table of Contents

- to comply with the provisions described above under “Description of Debt Securities—Consolidation, Merger or Sale;”
- to provide for uncertificated debt securities in addition to or in place of certificated debt securities;
- to add to our covenants, restrictions, conditions or provisions such new covenants, restrictions, conditions or provisions for the benefit of the holders of all or any series of debt securities, to make the occurrence, or the occurrence and the continuance, of a default in any such additional covenants, restrictions, conditions or provisions an event of default or to surrender any right or power conferred upon us in the indenture;
- to add to, delete from or revise the conditions, limitations, and restrictions on the authorized amount, terms, or purposes of issue, authentication and delivery of debt securities, as set forth in the indenture;
- to make any change that does not adversely affect the interests of any holder of debt securities of any series in any material respect;
- to provide for the issuance of and establish the form and terms and conditions of the debt securities of any series as provided above under “Description of Debt Securities—General” to establish the form of any certifications required to be furnished pursuant to the terms of the indenture or any series of debt securities, or to add to the rights of the holders of any series of debt securities;
- to evidence and provide for the acceptance of appointment under any indenture by a successor trustee; or
- to comply with any requirements of the SEC in connection with the qualification of any indenture under the Trust Indenture Act.

In addition, under the indenture, the rights of holders of a series of debt securities may be changed by us and the trustee with the written consent of the holders of at least a majority in aggregate principal amount of the outstanding debt securities of each series that is affected. However, unless we provide otherwise in the prospectus supplement applicable to a particular series of debt securities, we and the trustee may make the following changes only with the consent of each holder of any outstanding debt securities affected:

- extending the fixed maturity of any debt securities of any series;
- reducing the principal amount, reducing the rate of or extending the time of payment of interest, or reducing any premium payable upon the redemption of any series of any debt securities; or
- reducing the percentage of debt securities, the holders of which are required to consent to any amendment, supplement, modification or waiver.

## **Discharge**

The indenture provides that we can elect to be discharged from our obligations with respect to one or more series of debt securities, except for specified obligations, including obligations to:

- provide for payment;
- register the transfer or exchange of debt securities of the series;
- replace stolen, lost or mutilated debt securities of the series;
- pay principal of and premium and interest on any debt securities of the series;
- maintain paying agencies;
- hold monies for payment in trust;
- recover excess money held by the trustee;

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## Table of Contents

- compensate and indemnify the trustee; and
- appoint any successor trustee.

In order to exercise our rights to be discharged, we must deposit with the trustee money or government obligations sufficient to pay all the principal of, any premium, if any, and interest on, the debt securities of the series on the dates payments are due.

### **Form, Exchange and Transfer**

We will issue the debt securities of each series only in fully registered form without coupons and, unless we provide otherwise in any applicable prospectus supplement, in denominations of \$1,000 and any integral multiple thereof. The indenture provides that we may issue debt securities of a series in temporary or permanent global form and as book-entry securities that will be deposited with, or on behalf of, The Depository Trust Company, or DTC, or another depository named by us and identified in any applicable prospectus supplement with respect to that series. To the extent the debt securities of a series are issued in global form and as book-entry, a description of terms relating to any book-entry securities will be set forth in any applicable prospectus supplement.

At the option of the holder, subject to the terms of the indenture and the limitations applicable to global securities described in any applicable prospectus supplement, the holder of the debt securities of any series can exchange the debt securities for other debt securities of the same series, in any authorized denomination and of like tenor and aggregate principal amount.

Subject to the terms of the indenture and the limitations applicable to global securities set forth in any applicable prospectus supplement, holders of the debt securities may present the debt securities for exchange or for registration of transfer, duly endorsed or with the form of transfer endorsed thereon duly executed if so required by us or the security registrar, at the office of the security registrar or at the office of any transfer agent designated by us for this purpose. Unless otherwise provided in the debt securities that the holder presents for transfer or exchange, we will impose no service charge for any registration of transfer or exchange, but we may require payment of any taxes or other governmental charges.

We will name in any applicable prospectus supplement the security registrar, and any transfer agent in addition to the security registrar, that we initially designate for any debt securities. We may at any time designate additional transfer agents or rescind the designation of any transfer agent or approve a change in the office through which any transfer agent acts, except that we will be required to maintain a transfer agent in each place of payment for the debt securities of each series.

If we elect to redeem the debt securities of any series, we will not be required to:

- issue, register the transfer of, or exchange any debt securities of that series during a period beginning at the opening of business 15 days before the day of mailing of a notice of redemption of any debt securities that may be selected for redemption and ending at the close of business on the day of the mailing; or
- register the transfer of or exchange of any debt securities so selected for redemption, in whole or in part, except the unredeemed portion of any debt securities we are redeeming in part.

### **Information Concerning the Trustee**

The trustee, other than during the occurrence and continuance of an event of default under an indenture, undertakes to perform only those duties as are specifically set forth in the applicable indenture. Upon an event of default under an indenture, the trustee must use the same degree of care as a prudent person would exercise or use in the conduct of his or her own affairs. Subject to this provision, the trustee is under no obligation to exercise any of the powers given it by the indenture at the request of any holder of debt securities unless it is offered reasonable security and indemnity against the costs, expenses and liabilities that it might incur.

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## **Table of Contents**

### **Payment and Paying Agents**

Unless we otherwise indicate in any applicable prospectus supplement, we will make payment of the interest on any debt securities on any interest payment date to the person in whose name the debt securities, or one or more predecessor securities, are registered at the close of business on the regular record date for the interest.

We will pay principal of and any premium and interest on the debt securities of a particular series at the office of the paying agents designated by us, except that unless we otherwise indicate in any applicable prospectus supplement, we will make interest payments by check that we will mail to the holder or by wire transfer to certain holders. Unless we otherwise indicate in any applicable prospectus supplement, we will designate the corporate trust office of the trustee as our sole paying agent for payments with respect to debt securities of each series. We will name in any applicable prospectus supplement any other paying agents that we initially designate for the debt securities of a particular series. We will maintain a paying agent in each place of payment for the debt securities of a particular series.

All money we pay to a paying agent or the trustee for the payment of the principal of or any premium or interest on any debt securities that remains unclaimed at the end of two years after such principal, premium or interest has become due and payable will be repaid to us, and the holder of the debt security thereafter may look only to us for payment thereof.

### **Governing Law**

The indenture and the debt securities, and any claim, controversy or dispute arising under or related to the indenture or the debt securities, will be governed by and construed in accordance with the laws of the State of New York, except to the extent that the Trust Indenture Act is applicable.

## DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplements and free writing prospectuses, summarizes the material terms and provisions of the warrants that we may offer under this prospectus, which may consist of warrants to purchase common stock, preferred stock, and debt securities, and may be issued in one or more series. Warrants may be issued independently or together with common stock, preferred stock, or debt securities offered by any prospectus supplement, and may be attached to or separate from those securities. While the terms we have summarized below will apply generally to any warrants that we may offer under this prospectus, we will describe the particular terms of any series of warrants that we may offer in more detail in any applicable prospectus supplement and any free writing prospectus. The terms of any warrants offered under any applicable prospectus supplement may differ from the terms described below. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We have filed forms of the warrant agreements and forms of warrant certificates as exhibits to the registration statement of which this prospectus is a part. We will file as an exhibit to the registration statement of which this prospectus is a part, or will incorporate by reference from reports that we file with the SEC, the form of warrant agreement, if any, including a form of warrant certificate, that describes the terms of the particular series of warrants we are offering. The following summaries of material provisions of the warrants and the warrant agreements are subject to, and qualified in their entirety by reference to, all the provisions of the warrant agreement and warrant certificate applicable to the particular series of warrants that we may offer under this prospectus. We urge you to read any applicable prospectus supplements related to the particular series of warrants that we may offer under this prospectus, as well as any related free writing prospectuses, and the complete warrant agreements and warrant certificates that contain the terms of the warrants.

### General

We will describe in any applicable prospectus supplement the terms relating to a series of warrants being offered, including:

- the title of such securities;
- the offering price or prices and aggregate number of warrants offered;
- the currency or currencies for which the warrants may be purchased;
- if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;
- if applicable, the date on and after which the warrants and the related securities will be separately transferable;
- if applicable, the minimum or maximum amount of such warrants which may be exercised at any one time;
- in the case of warrants to purchase debt securities, the principal amount of debt securities purchasable upon exercise of one warrant and the price at which, and currency in which, this principal amount of debt securities may be purchased upon such exercise;
- in the case of warrants to purchase common stock or preferred stock, the number of shares of common stock or preferred stock, as the case may be, purchasable upon the exercise of one warrant and the price at which, and the currency in which, these shares may be purchased upon such exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreements and the warrants;

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## **Table of Contents**

- the terms of any rights to redeem or call the warrants;
- the terms of any rights to force the exercise of the warrants;
- any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreements and warrants may be modified;
- a discussion of any material or special U.S. federal income tax consequences of holding or exercising the warrants;
- the terms of the securities issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Before exercising their warrants, holders of warrants will not have any of the rights of holders of the securities purchasable upon such exercise, including:

- in the case of warrants to purchase debt securities, the right to receive payments of principal of, or premium, if any, or interest on, the debt securities purchasable upon exercise or to enforce covenants in the applicable indenture; or
- in the case of warrants to purchase common stock or preferred stock, the right to receive dividends, if any, or, payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any.

### **Exercise of Warrants**

Each warrant will entitle the holder to purchase the securities that we specify in any applicable prospectus supplement at the exercise price that we describe in any applicable prospectus supplement. Unless we otherwise specify in any applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to the specified time on the expiration date that we set forth in any applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Unless we otherwise specify in any applicable prospectus supplement, holders of the warrants may exercise the warrants by delivering the warrant certificate representing the warrants to be exercised together with specified information, and paying the required amount to the warrant agent in immediately available funds, as provided in any applicable prospectus supplement. We will set forth on the reverse side of the warrant certificate and in any applicable prospectus supplement the information that the holder of the warrant will be required to deliver to the warrant agent in connection with the exercise of the warrant.

Upon receipt of the required payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in any applicable prospectus supplement, we will issue and deliver the securities purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate are exercised, then we will issue a new warrant certificate for the remaining amount of warrants. If we so indicate in any applicable prospectus supplement, holders of the warrants may surrender securities as all or part of the exercise price for warrants.

### **Governing Law**

Unless we provide otherwise in any applicable prospectus supplement, the warrants and warrant agreements, and any claim, controversy or dispute arising under or related to the warrants or warrant agreements, will be governed by and construed in accordance with the laws of the State of New York.

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[Table of Contents](#)

**Enforceability of Rights by Holders of Warrants**

Each warrant agent, if any, will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the securities purchasable upon exercise of, its warrants.



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## [Table of Contents](#)

### LEGAL OWNERSHIP OF SECURITIES

We can issue securities in registered form or in the form of one or more global securities. We describe global securities in greater detail below. We refer to those persons who have securities registered in their own names on the books that we or any applicable trustee, depository or warrant agent maintain for this purpose as the “holders” of those securities. These persons are the legal holders of the securities. We refer to those persons who, indirectly through others, own beneficial interests in securities that are not registered in their own names, as “indirect holders” of those securities. As we discuss below, indirect holders are not legal holders, and investors in securities issued in book-entry form or in street name will be indirect holders.

#### **Book-Entry Holders**

We may issue securities in book-entry form only, as we will specify in any applicable prospectus supplement. This means securities may be represented by one or more global securities registered in the name of a financial institution that holds them as depository on behalf of other financial institutions that participate in the depository’s book-entry system. These participating institutions, which are referred to as participants, in turn, hold beneficial interests in the securities on behalf of themselves or their customers.

Only the person in whose name a security is registered is recognized as the holder of that security. Securities issued in global form will be registered in the name of the depository or its participants. Consequently, for securities issued in global form, we will recognize only the depository as the holder of the securities, and we will make all payments on the securities to the depository. The depository passes along the payments it receives to its participants, which in turn pass the payments along to their customers who are the beneficial owners. The depository and its participants do so under agreements they have made with one another or with their customers; they are not obligated to do so under the terms of the securities.

As a result, investors in a global security will not own securities directly. Instead, they will own beneficial interests in a global security, through a bank, broker or other financial institution that participates in the depository’s book-entry system or holds an interest through a participant. As long as the securities are issued in global form, investors will be indirect holders, and not legal holders, of the securities.

#### **Street Name Holders**

We may terminate a global security or issue securities in non-global form. In these cases, investors may choose to hold their securities in their own names or in “street name.” Securities held by an investor in street name would be registered in the name of a bank, broker or other financial institution that the investor chooses, and the investor would hold only a beneficial interest in those securities through an account he or she maintains at that institution.

For securities held in street name, we or any applicable trustee or depository will recognize only the intermediary banks, brokers and other financial institutions in whose names the securities are registered as the holders of those securities, and we or any applicable trustee or depository will make all payments on those securities to them. These institutions pass along the payments they receive to their customers who are the beneficial owners, but only because they agree to do so in their customer agreements or because they are legally required to do so. Investors who hold securities in street name will be indirect holders, not holders, of those securities.

#### **Legal Holders**

Our obligations, as well as the obligations of any applicable trustee and of any third parties employed by us or a trustee, run only to the legal holders of the securities. We do not have obligations to investors who hold beneficial interests in global securities, in street name or by any other indirect means. This will be the case whether an investor chooses to be an indirect holder of a security or has no choice because we are issuing the securities only in global form.

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## **Table of Contents**

For example, once we make a payment or give a notice to the legal holder, we have no further responsibility for the payment or notice even if that legal holder is required, under agreements with its participants or customers or by law, to pass it along to the indirect holders but does not do so. Similarly, we may want to obtain the approval of the legal holders to amend an indenture, to relieve us of the consequences of a default or of our obligation to comply with a particular provision of the indenture or for other purposes. In such an event, we would seek approval only from the holders, and not the indirect holders, of the securities. Whether and how the legal holders contact the indirect holders is up to the legal holders.

### **Special Considerations for Indirect Holders**

If you hold securities through a bank, broker or other financial institution, either in book-entry form because the securities are represented by one or more global securities or in street name, you should check with your own institution to find out:

- how it handles securities payments and notices;
- whether it imposes fees or charges;
- how it would handle a request for the holders' consent, if ever required;
- whether and how you can instruct it to send you securities registered in your own name so you can be a holder, if that is permitted in the future;
- how it would exercise rights under the securities if there were a default or other event triggering the need for holders to act to protect their interests; and
- if the securities are in book-entry form, how the depository's rules and procedures will affect these matters.

### **Global Securities**

A global security is a security that represents one or any other number of individual securities held by a depository. Generally, all securities represented by the same global securities will have the same terms.

Each security issued in book-entry form will be represented by a global security that we issue to, deposit with and register in the name of a financial institution or its nominee that we select. The financial institution that we select for this purpose is called the depository. Unless we specify otherwise in any applicable prospectus supplement, DTC will be the depository for all securities issued in book-entry form.

A global security may not be transferred to or registered in the name of anyone other than the depository, its nominee or a successor depository, unless special termination situations arise. We describe those situations below under "Special Situations When a Global Security Will Be Terminated." As a result of these arrangements, the depository, or its nominee, will be the sole registered owner and legal holder of all securities represented by a global security, and investors will be permitted to own only beneficial interests in a global security. Beneficial interests must be held by means of an account with a broker, bank or other financial institution that in turn has an account with the depository or with another institution that does. Thus, an investor whose security is represented by a global security will not be a legal holder of the security, but only an indirect holder of a beneficial interest in the global security.

If the prospectus supplement for a particular security indicates that the security will be issued in global form only, then the security will be represented by a global security at all times unless and until the global security is terminated. If termination occurs, we may issue the securities through another book-entry clearing system or decide that the securities may no longer be held through any book-entry clearing system.

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## Table of Contents

### **Special Considerations for Global Securities**

The rights of an indirect holder relating to a global security will be governed by the account rules of the investor's financial institution and of the depository, as well as general laws relating to securities transfers. We do not recognize an indirect holder as a holder of securities and instead deal only with the depository that holds the global security.

If securities are issued only in the form of a global security, an investor should be aware of the following:

- an investor cannot cause the securities to be registered in his or her name, and cannot obtain non-global certificates for his or her interest in the securities, except in the special situations we describe below;
- an investor will be an indirect holder and must look to his or her own bank, broker or other financial institution for payments on the securities and protection of his or her legal rights relating to the securities, as we describe above;
- an investor may not be able to sell interests in the securities to some insurance companies and to other institutions that are required by law to own their securities in non-book-entry form;
- an investor may not be able to pledge his or her interest in a global security in circumstances where certificates representing the securities must be delivered to the lender or other beneficiary of the pledge in order for the pledge to be effective;
- the depository's policies, which may change from time to time, will govern payments, transfers, exchanges and other matters relating to an investor's interest in a global security;
- we and any applicable trustee have no responsibility for any aspect of the depository's actions or for its records of ownership interests in a global security, nor do we or any applicable trustee supervise the depository in any way;
- the depository may, and we understand that DTC will, require that those who purchase and sell interests in a global security within its book-entry system use immediately available funds, and your bank, broker or other financial institution may require you to do so as well; and
- financial institutions that participate in the depository's book-entry system, and through which an investor holds its interest in a global security, may also have their own policies affecting payments, notices and other matters relating to the securities.

There may be more than one financial intermediary in the chain of ownership for an investor. We do not monitor and are not responsible for the actions of any of those intermediaries.

### **Special Situations When a Global Security Will Be Terminated**

In a few special situations described below, the global security will terminate and interests in it will be exchanged for physical certificates representing those interests. After that exchange, the choice of whether to hold securities directly or in street name will be up to the investor. Investors must consult their own banks, brokers or other financial institutions to find out how to have their interests in securities transferred to their own name, so that they will be direct holders. We have described the rights of holders and street name investors above.

Unless we provide otherwise in any applicable prospectus supplement, the global security will terminate when the following special situations occur:

- if the depository notifies us that it is unwilling, unable or no longer qualified to continue as depository for that global security and we do not appoint another institution to act as depository within 90 days;
- if we notify any applicable trustee that we wish to terminate that global security; or

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## Table of Contents

- if an event of default has occurred with regard to securities represented by that global security and has not been cured or waived.

The prospectus supplement may also list additional situations for terminating a global security that would apply only to the particular series of securities covered by any applicable prospectus supplement. When a global security terminates, the depositary, and not we or any applicable trustee, is responsible for deciding the names of the institutions that will be the initial direct holders.

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[Table of Contents](#)

**PLAN OF DISTRIBUTION**

We may sell the securities from time to time pursuant to underwritten public offerings, direct sales to the public, negotiated transactions, block trades or a combination of these methods. We may sell the securities to or through underwriters or dealers, through agents, or directly to one or more purchasers. We may distribute securities from time to time in one or more transactions:

- at a fixed price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices; or
- at negotiated prices.

We may also sell equity securities covered by this registration statement in an “at the market offering” as defined in Rule 415 under the Securities Act. Such offering may be made into an existing trading market for such securities in transactions at other than a fixed price, either:

- on or through the facilities of The NASDAQ Capital Market or any other securities exchange or quotation or trading service on which such securities may be listed, quoted or traded at the time of sale; and/or
- other than on The NASDAQ Capital Market or such other securities exchanges or quotation or trading services.

Such at the market offerings, if any, may be conducted by underwriters acting as principal or agent.

A prospectus supplement or supplements (and any related free writing prospectus that we may authorize to be provided to you) will describe the terms of the offering of the securities, including, to the extent applicable:

- the name or names of the underwriters, if any;
- the purchase price of the securities or other consideration therefor, and the proceeds, if any, we will receive from the sale;
- any over-allotment or other options under which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents’ or underwriters’ compensation;
- any public offering price;
- any discounts or concessions allowed or reallocated or paid to dealers; and
- any securities exchange or market on which the securities may be listed.

Only underwriters named in the prospectus supplement will be underwriters of the securities offered by the prospectus supplement.

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities from time to time in one or more transactions at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all of the securities offered by the prospectus

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## Table of Contents

supplement, other than securities covered by any over-allotment or other option. Any public offering price and any discounts or concessions allowed or reallowed or paid to dealers may change from time to time. We may use underwriters with whom we have a material relationship. We will describe in the prospectus supplement, naming the underwriter, the nature of any such relationship.

We may sell securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of securities and we will describe any commissions we will pay the agent in an applicable prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

We may authorize agents or underwriters to solicit offers by certain types of institutional investors to purchase securities from us at the public offering price set forth in an applicable prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. We will describe the conditions to these contracts and the commissions we must pay for solicitation of these contracts in the prospectus supplement.

We may provide agents and underwriters with indemnification against civil liabilities, including liabilities under the Securities Act, or contribution with respect to payments that the agents or underwriters may make with respect to these liabilities. Agents and underwriters may engage in transactions with, or perform services for, us in the ordinary course of business.

All securities we may offer, other than common stock, will be new issues of securities with no established trading market. Any underwriters may make a market in these securities, but will not be obligated to do so and may discontinue any market making at any time without notice. We cannot guarantee the liquidity of the trading markets for any securities.

Any underwriter may engage in over-allotment, stabilizing transactions, short-covering transactions and penalty bids in accordance with Regulation M under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Over-allotment involves sales in excess of the offering size, which create a short position. Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum price. Syndicate-covering or other short-covering transactions involve purchases of the securities, either through exercise of the over-allotment option or in the open market after the distribution is completed, to cover short positions. Penalty bids permit the underwriters to reclaim a selling concession from a dealer when the securities originally sold by the dealer are purchased in a stabilizing or covering transaction to cover short positions. Those activities may cause the price of the securities to be higher than it would otherwise be. If commenced, the underwriters may discontinue any of the activities at any time.

Any underwriters or agents that are qualified market makers on The NASDAQ Capital Market may engage in passive market making transactions in the common stock on The NASDAQ Capital Market in accordance with Regulation M under the Exchange Act, during the business day prior to the pricing of the offering, before the commencement of offers or sales of the common stock. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security; if all independent bids are lowered below the passive market maker's bid, however, the passive market maker's bid must then be lowered when certain purchase limits are exceeded. Passive market making may stabilize the market price of the securities at a level above that which might otherwise prevail in the open market and, if commenced, may be discontinued at any time.

In compliance with guidelines of the Financial Industry Regulatory Authority, or FINRA, the maximum consideration or discount to be received by any FINRA member or independent broker dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

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[Table of Contents](#)

**LEGAL MATTERS**

Unless otherwise indicated in any applicable prospectus supplement, Cooley LLP, Broomfield, Colorado, will pass upon the validity of the securities offered by this prospectus and any supplement thereto. As of the date of this prospectus, GC&H Investments, LLC, an entity that includes current and former partners and associates of Cooley LLP, beneficially owns 4,338 shares of our common stock. Additional legal matters may be passed upon for us or any underwriters, dealers or agents by counsel that we name in any applicable prospectus supplement.

**EXPERTS**

The consolidated financial statements of Miragen Therapeutics, Inc., as of December 31, 2016 and 2015, and for the years then ended, have been incorporated by reference herein and in the registration statement, in reliance upon the report of KPMG LLP, independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

The consolidated financial statements of Miragen Therapeutics, Inc. (formerly known as Signal Genetics, Inc.) as of December 31, 2016 and 2015 and for each of the two years in the period ended December 31, 2016 incorporated by reference in this prospectus have been so incorporated in reliance on the report of BDO USA, LLP, an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

**WHERE YOU CAN FIND MORE INFORMATION**

This prospectus is part of a registration statement we filed with the SEC. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. Neither we nor any agent, underwriter or dealer has authorized any person to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front page of this prospectus, regardless of the time of delivery of this prospectus or any sale of the securities offered by this prospectus.

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any document we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C., 20549. Please call the SEC at 1.800.SEC.0330 for further information on the operation of the public reference room. Our SEC filings are also available to the public via the SEC's Internet site, which contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, at <http://www.sec.gov>.

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[Table of Contents](#)

**INCORPORATION OF CERTAIN INFORMATION BY REFERENCE**

The SEC allows us to “incorporate by reference” the information we file with it, which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus. The information incorporated by reference is considered to be part of this prospectus, and later information that we file with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings (including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to the effectiveness of such registration statement) we will make with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act until the termination of the offering of the shares covered by this prospectus (other than information furnished under Item 2.02 or Item 7.01 of Form 8-K):

- our Annual Report on [Form 10-K](#) for the year ended December 31, 2016 filed with the SEC on March 24, 2017;
- our current reports on Form 8-K and any amendments thereto (excluding any reports or portions thereof that are deemed to be furnished and not filed) filed with the SEC on the following dates: [January 9, 2017](#), [February 10, 2017](#), [February 13, 2017](#) (as amended on [March 31, 2017](#)), [March 30, 2017](#), and [March 31, 2017](#); and
- the description of our common stock contained in our registration statement on [Form 8-A](#) filed with the SEC on June 6, 2014, including any amendments thereto or reports filed for the purposes of updating this description.

You can request a copy of these filings, at no cost, by writing or telephoning us at the following address or telephone number:

Miragen Therapeutics, Inc.  
6200 Lookout Road  
Boulder, CO 80301  
Attn: Investor Relations  
Tel: (720) 407-4595  
Email: [InvestorRelations@miragenrx.com](mailto:InvestorRelations@miragenrx.com)

This prospectus is part of a registration statement we filed with the SEC. That registration statement and the exhibits filed along with the registration statement contain more information about us and the shares in this offering. Because information about documents referred to in this prospectus is not always complete, you should read the full documents which are filed as exhibits to the registration statement. You may read and copy the full registration statement and its exhibits at the SEC’s public reference rooms or its website.





**Shares of Common Stock**

**Warrants to Purchase up to                      Shares of Common Stock**

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**Prospectus Supplement**

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**Oppenheimer & Co.**

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, 2020