

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549**

**FORM S-3  
REGISTRATION STATEMENT**

UNDER  
THE SECURITIES ACT OF 1933

**IDERA PHARMACEUTICALS, INC.**

(Exact name of registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction of  
incorporation or organization)

**04-3072298**  
(I.R.S. Employer  
Identification No.)

505 Eagleview Blvd., Suite 212  
Exton, Pennsylvania 19341  
(484) 348-1600

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Vincent J. Milano**  
President and Chief Executive Officer  
Idera Pharmaceuticals, Inc.  
505 Eagleview Blvd., Suite 212  
Exton, Pennsylvania 19341  
(484) 348-1600

(Name, address, including zip code, and telephone number, including area code, of agent for service)

*Copy to:*

**Celia A. Soehner**  
Morgan, Lewis & Bockius LLP  
One Oxford Centre, 32nd Floor  
Pittsburgh, PA  
(412) 560-3300

**Approximate date of commencement of proposed sale to the public:** From time to time after the effective date of this registration statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act of 1933, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act of 1933, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act of 1933, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act of 1933, check the following box.

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

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

**CALCULATION OF REGISTRATION FEE**

<b>Title of Each Class of Securities to be Registered(1)</b>	<b>Amount to be Registered(1)</b>	<b>Proposed Maximum Offering Price Per Unit(2)</b>	<b>Proposed Maximum Aggregate Offering Price(2)</b>	<b>Amount of Registration Fee(3)</b>
Common Stock, par value \$0.001 per share				
Preferred Stock, par value \$0.01 per share				
Depository Shares(4)				
Warrants				
<b>Total</b>			\$150,000,000	\$19,470

- (1) An indeterminate number of securities or aggregate principle amount, as applicable, is being registered from time to time to be offered and unspecified prices and, in addition, an unspecified number of additional shares of common stock is being registered as may be issued from time to time upon conversion of any debt securities that are convertible into common stock or pursuant to any anti-dilution adjustments with respect to any such convertible debt securities. In addition, pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this registration statement is hereby deemed to include such indeterminate number of shares of common stock and preferred stock as may be issuable as a result of stock splits, stock dividends or similar transactions.
- (2) The proposed maximum aggregate offering price of each class of securities will be determined from time to time by the registrant in connection with the issuance by the registrant of the securities registered hereunder and is not specified as to each class of securities pursuant to General Instruction II.D of Form S-3 under the Securities Act.
- (3) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act. In no event will the aggregate offering price of all securities sold by the registrant from time to time pursuant to this registration statement exceed \$150,000,000. Pursuant to Rule 415(a)(6) under the Securities Act, the securities registered pursuant to this registration statement include unsold securities previously registered by the registrant on the registrant's registration statement (File No. 333-219851) filed on August 10, 2017 and as amended and declared effective on September 8, 2017 (the "2017 Registration Statement"). The 2017 Registration Statement registered the offer and sale of an indeterminate number or amount of common stock, preferred stock, depository shares, and warrants, having an aggregate initial offering price of \$250,000,000, of which securities in the amount of approximately \$184,000,000 remain unsold as of the date of filing of this registration statement. The registrant has determined to include in this registration statement certain unsold securities under the 2017 Registration Statement with an aggregate offering price of \$150,000,000, or the Unsold Securities. Pursuant to Rule 415(a)(6) under the Securities Act, this registration statement includes all of the Unsold Securities and the registrant is applying the previously paid filing fee associated with the Unsold Securities to this registration statement. As a result, no fee is being paid in connection with this filing. Pursuant to Rule 415(a)(6) under the Securities Act, the offering of the Unsold Securities under the 2017 Registration Statement will be deemed terminated as of the date of effectiveness of this registration statement.
- (4) Each depository share will be issued under a deposit agreement, will represent an interest in a fractional share or multiple shares of preferred stock and will be evidenced by a depository receipt.

The registrant has an existing "shelf" registration statement, File No. 333-219851, that was declared effective on September 8, 2017 and which expires on September 8, 2020 pursuant to Rule 415(a)(5) under the Securities Act. Pursuant to Rule 415(a)(6) promulgated under the Securities Act, the filing fees previously paid in connection with the securities being registered hereunder will continue to be applied to such securities. In accordance with Rule 415(a)(5) and Rule 415(a)(6), the registrant may continue to offer and sell the securities covered by the existing shelf registration statement during the grace period afforded by Rule 415(a)(5). If the registrant sells any securities being registered hereunder during the grace period, the registrant will identify in a pre-effective amendment to this registration statement the new amount of securities to be carried forward to this registration statement in reliance upon Rule 415(a)(6).

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act or until this registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

**The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and we are not soliciting offers to buy these securities in any jurisdiction where the offer or sale is not permitted.**

**Subject to completion, dated August 4, 2020**

**PROSPECTUS**

**\$150,000,000**

# **IDERA PHARMACEUTICALS, INC.**

**Common Stock**

**Preferred Stock**

**Depositary Shares**

**Warrants**

We may offer and sell securities from time to time in one or more offerings of up to \$150,000,000 in aggregate offering price. This prospectus describes the general terms of these securities and the general manner in which these securities will be offered. We will provide the specific terms of these securities in supplements to this prospectus. The prospectus supplements will also describe the specific manner in which these securities will be offered and may also supplement, update or amend information contained in this document. You should read this prospectus and any applicable prospectus supplement before you invest.

We may offer these securities in amounts, at prices and on terms determined at the time of offering. The securities may be sold directly to you, through agents, or through underwriters and dealers. If agents, underwriters or dealers are used to sell the securities, we will name them and describe their compensation in a prospectus supplement.

Our common stock is listed on the Nasdaq Capital Market under the symbol "IDRA." On July 31, 2020, the closing sale price of our common stock on the Nasdaq Capital Market was \$1.99 per share. You are urged to obtain current market quotations for our common stock.

**INVESTING IN OUR SECURITIES INVOLVES RISKS. SEE THE "[RISK FACTORS](#)" ON PAGE 6 OF THIS PROSPECTUS AND ANY SIMILAR SECTION CONTAINED IN THE APPLICABLE PROSPECTUS SUPPLEMENT AND IN THE DOCUMENTS INCLUDED BY REFERENCE IN THIS PROSPECTUS OR ANY PROSPECTUS SUPPLEMENT CONCERNING FACTORS YOU SHOULD CONSIDER BEFORE INVESTING IN OUR SECURITIES.**

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.**

**The date of this prospectus is                      , 2020.**

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## ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, utilizing a “shelf” registration process. Under this shelf registration process, we may from time to time sell any combination of the securities described in this prospectus in one or more offerings for an aggregate initial offering price of up to \$150,000,000.

This prospectus provides you with a general description of the securities we may offer. Each time we sell securities, we will provide one or more prospectus supplements that will contain specific information about the terms of the 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. The prospectus supplement or free writing prospectus may also add, update or change information contained in this prospectus with respect to that offering. If there is any inconsistency between the information in this prospectus and the applicable prospectus supplement or free writing prospectus, you should rely on the prospectus supplement or free writing prospectus, as applicable. Before purchasing any securities, you should carefully read both this prospectus and the applicable prospectus supplement (and any applicable free writing prospectuses), together with the additional information described under the heading “Where You Can Find More Information” beginning on page 2 of this prospectus.

We have not authorized anyone to provide you with any information or to make any representations other than those contained in this prospectus, any applicable prospectus supplement or any free writing prospectuses prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We will not make an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus and the applicable prospectus supplement to this prospectus is accurate only as of the date on its respective cover, that the information appearing in any applicable free writing prospectus is accurate only as of the date of that free writing prospectus, and that any information incorporated by reference is accurate only as of the date of the document incorporated by reference, unless we indicate otherwise. Our business, financial condition, results of operations and prospects may have changed since those dates. This prospectus incorporates by reference, and any prospectus supplement or free writing prospectus may contain and incorporate by reference, market data and industry statistics and forecasts that are based on independent industry publications and other publicly available information. Although we believe these sources are reliable, we do not guarantee the accuracy or completeness of this information and we have not independently verified this information. In addition, the market and industry data and forecasts that may be included or incorporated by reference in this prospectus, any prospectus supplement or any applicable free writing prospectus may involve estimates, assumptions and other risks and uncertainties and are subject to change based on various factors, including those discussed under the heading “Risk Factors” contained in this prospectus, the applicable prospectus supplement and any applicable free writing prospectus, and under similar headings in other documents that are incorporated by reference into this prospectus. Accordingly, investors should not place undue reliance on this information.

Unless the context otherwise indicates, references in this prospectus to “we,” “our” and “us” collectively refer to Idera Pharmaceuticals, Inc., a Delaware corporation.

**You should rely only on the information contained in this prospectus, any applicable prospectus supplement and any related free writing prospectus, including the information we incorporate by reference as described under “Where You Can Find More Information.” We have not authorized anyone to provide you with different information. If you receive any other information, you should not rely on it. No dealer, salesperson or other person is authorized to give any information or to represent anything not contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus that we may authorize to be provided to you. You must not rely on any unauthorized information or representation. This prospectus is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so.**

## WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current 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 <http://www.sec.gov>. Copies of certain information filed by us with the SEC are also available on our website at <http://www.iderapharma.com>. Our website is not a part of this prospectus and is not incorporated by reference in this prospectus.

This prospectus is part of a registration statement we filed with the SEC. This prospectus omits some information contained in the registration statement in accordance with SEC rules and regulations. You should review the information and exhibits in the registration statement for further information about us and the securities we are offering. Statements in this prospectus concerning any document we filed as an exhibit to the registration statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified by reference to these filings. You should review the complete document to evaluate these statements.

## INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus much of the information we file with the SEC, which means that we can disclose important information to you by referring you to those publicly available documents. The information that we incorporate by reference in this prospectus is considered to be part of this prospectus. Because we are incorporating by reference future filings with the SEC, this prospectus is continually updated and those future filings may modify or supersede some of the information included or incorporated in this prospectus. This means that you must look at all of the SEC filings that we incorporate by reference to determine if any of the statements in this prospectus or in any document previously incorporated by reference have been modified or superseded. This prospectus incorporates by reference the documents listed below and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act (in each case, other than those documents or the portions of those documents not deemed to be filed) between the date of the initial registration statement and the effectiveness of the registration statement and following the effectiveness of the registration statement until the offering of the securities under the registration statement is terminated or completed:

- (1) [Our Annual Report on Form 10-K for the year ended December 31, 2019](#), including the information specifically incorporated by reference into the Annual Report on Form 10-K from our [definitive proxy statement on Schedule 14A for the 2020 Annual Meeting of Stockholders](#);
- (2) Our Quarterly Reports on Form 10-Q for the fiscal quarter ended [March 31, 2020](#) and [June 30, 2020](#);
- (3) Our Current Reports on Form 8-K filed on [January 15, 2020](#) (Item 5.02 and related exhibits 10.1 and 10.2 only), [January 27, 2020](#), [April 7, 2020](#), [May 1, 2020](#) (Item 8.01 only), [May 14, 2020](#), [May 18, 2020](#), [June 15, 2020](#) and [July 15, 2020](#);
- (4) The description of our common stock contained in our [Registration Statement on Form 8-A filed on December 4, 2003](#), as amended on [August 17, 2007](#) and as further amended on [December 7, 2007](#), including any amendments or reports filed for the purpose of updating such description.

You may request a copy of these documents, which will be provided to you at no cost, by writing or telephoning us using the following contact information below. We will provide copies of the exhibits to these filings only if they are specifically incorporated by reference in these filings.

Idera Pharmaceuticals, Inc.  
505 Eagleview Blvd., Suite 212  
Exton, Pennsylvania 19341  
Attention: Investor Relations  
(484) 348-1600

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents we incorporate by reference contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. All statements, other than statements of historical fact, included or incorporated in this prospectus regarding our strategy, future operations, clinical trials, collaborations, intellectual property, cash resources, financial position, future revenues, projected costs, prospects, plans, and objectives of management are forward-looking statements. The words “believes,” “anticipates,” “estimates,” “plans,” “expects,” “intends,” “may,” “could,” “should,” “potential,” “likely,” “projects,” “continue,” “will,” “schedule,” “would,” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We cannot guarantee that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. These forward-looking statements involve known and unknown risks, uncertainties, and other factors, which may be beyond our control, and which may cause our actual results, performance, or achievements to be materially different from future results, performance, or achievements expressed or implied by such forward-looking statements. There are a number of important factors that could cause our actual results to differ materially from those indicated or implied by forward-looking statements. See “Risk Factors” in this prospectus and in our Annual Report on Form 10-K for the year ended December 31, 2019 for more information. These factors and the other cautionary statements made in this prospectus and the documents we incorporate by reference should be read as being applicable to all related forward-looking statements whenever they appear in this prospectus and the documents we incorporate by reference. In addition, any forward-looking statements represent our estimates only as of the date that this prospectus is filed with the SEC and should not be relied upon as representing our estimates as of any subsequent date. We do not assume any obligation to update any forward-looking statements. We disclaim any intention or obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise, except as may be required by law.



## **IDERA PHARMACEUTICALS, INC.**

We are a clinical-stage biopharmaceutical company with a business strategy focused on the clinical development, and ultimately the commercialization, of drug candidates for both oncology and rare disease indications characterized by small, well-defined patient populations with serious unmet medical needs. Our current focus is on our Toll-like receptor, or TLR, agonist, tilsotolimod (IMO-2125), for oncology. We believe we can develop and commercialize targeted therapies on our own. To the extent we seek to develop drug candidates for broader disease indications, we have entered into and may explore additional collaborative alliances to support development and commercialization.

TLRs are key receptors of the immune system and play a role in innate and adaptive immunity. As a result, we believe TLRs are potential therapeutic targets for the treatment of a broad range of diseases. Using our chemistry-based platform, we designed both TLR agonists and antagonists to act by modulating the activity of targeted TLRs. A TLR agonist is a compound that stimulates an immune response through the targeted TLR. A TLR antagonist is a compound that inhibits an immune response by blocking the targeted TLR.

Our current TLR-targeted clinical-stage drug candidate, tilsotolimod, is an agonist of TLR9. We are currently developing tilsotolimod, via intratumoral injection, for the treatment of anti-PD1 refractory metastatic melanoma in combination with ipilimumab, an anti-CTLA4 antibody marketed as Yervoy® by Bristol Myers Squibb Company (“BMS”) in a Phase 3 registration trial. We are also evaluating intratumoral tilsotolimod in combination with nivolumab, an anti-PD1 antibody marketed as Opdivo® by BMS, and ipilimumab for the treatment of solid tumors in a multicohort Phase 2 trial.

### **Corporate Information**

Our executive offices are located at 505 Eagleview Boulevard, Suite 212, Exton, Pennsylvania 19341, our telephone number is (484) 348-1600 and our Internet address is [www.iderapharma.com](http://www.iderapharma.com). The information on our website is not incorporated by reference in this prospectus and should not be considered to be part of this prospectus. Our website address is included in this prospectus as an inactive technical reference only. Unless the context otherwise requires, references in this prospectus to “Idera Pharmaceuticals,” “we,” “us,” and “our” refer to Idera Pharmaceuticals, Inc. Idera® and IMO® are our trademarks. All other trademarks and service marks appearing in this registration statement are the property of their respective owners.

## **RISK FACTORS**

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described in this prospectus, including the risk factors set forth in the documents and reports filed with the SEC that are incorporated by reference herein, such as the risk factors under the heading “Risk Factors” in our most recent Annual Report on Form 10-K on file with the SEC, which are incorporated by reference in this prospectus, before purchasing our common stock. If any of these risks actually occurs, our business, financial condition or results of operations would likely suffer, possibly materially. In that case, the trading price of our common stock could fall, and you may lose all or part of the money you paid to buy our common stock.

## USE OF PROCEEDS

We intend to use the net proceeds from the sale of any securities offered under this prospectus for general corporate purposes unless otherwise indicated in the applicable prospectus supplement. General corporate purposes may include research and development costs, the acquisition or licensing of complementary products, technologies or businesses, working capital and capital expenditures. We may temporarily invest the net proceeds in investment-grade, interest-bearing securities until they are used for their stated purpose. We have not determined the amount of net proceeds to be used specifically for such purposes. As a result, management will retain broad discretion over the allocation of net proceeds.

## DESCRIPTION OF CAPITAL STOCK

The following description of our capital stock is intended as a summary only and therefore is not a complete description of our capital stock. This description is based upon, and is qualified by reference to, our certificate of incorporation and our bylaws, each as amended from time to time, and by applicable provisions of Delaware corporate law. You should read our certificate of incorporation and bylaws, which are filed as exhibits to the registration statement of which this prospectus forms a part, for the provisions that are important to you.

### Common Stock

We are authorized to issue 140,000,000 shares of common stock, \$0.001 par value per share. As of July 31, 2020, there were 35,199,246 shares of common stock outstanding.

*Annual Meeting.* Annual meetings of our stockholders are held on the date designated in accordance with our bylaws. Written notice must be mailed to each stockholder entitled to vote not less than ten nor more than 60 days before the date of the meeting. The presence in person or by proxy of the holders of record of a majority of our issued and outstanding shares entitled to vote at such meeting constitutes a quorum for the transaction of business at meetings of the stockholders. Special meetings of the stockholders may be called for any purpose by the board of directors, the chief executive officer or, if the office of chief executive officer is vacant, our president.

*Voting Rights.* For all matters submitted to a vote of stockholders, each holder of common stock is entitled to one vote for each share held. Our common stock does not have cumulative voting rights.

*Dividends.* If our board of directors declares a dividend, holders of common stock will receive payments from our funds that are legally available to pay dividends. However, this dividend right is subject to any preferential dividend rights that we have granted or may grant with respect to our preferred stock.

*Liquidation, Dissolution or Winding-Up.* Upon our liquidation, dissolution or winding-up, the holders of the common stock will be entitled to share equally in all assets available for distribution to stockholders, subject to preferences that may apply to shares of preferred stock outstanding at that time. The amount available for common stockholders is calculated after payment of liabilities.

*Other Rights and Restrictions.* Holders of our common stock do not have preemptive rights, and they have no right to convert their common stock into any other securities. Our common stock is not subject to redemption by us. The rights, preferences and privileges of common stockholders are subject to the rights of the stockholders of any series of preferred stock that are issued and outstanding or that we may issue in the future. Our certificate of incorporation and bylaws do not restrict the ability of a holder of common stock to transfer his or her shares of common stock.

*Put Right.* Pursuant to the terms of a unit purchase agreement dated as of May 5, 1998, we issued and sold a total of 149,960 shares of common stock, which we refer to as the put shares, at a price of \$128.00 per share. Under the terms of the unit purchase agreement, the initial purchasers, which we refer to as the put holders, of the put shares have the right, which we refer to as the put right, to require us to repurchase the put shares. The put right may not be exercised by any put holder unless all of the following occur:

- we liquidate, dissolve or wind up our affairs pursuant to applicable bankruptcy law, whether voluntarily or involuntarily;
- all of our indebtedness and obligations, including without limitation the indebtedness under our outstanding notes, has been paid in full; and
- all rights of the holders of any series or class of capital stock ranking prior and senior to the common stock with respect to liquidation, including without limitation the series A convertible preferred stock, have been satisfied in full.

We may terminate the put right upon written notice to the put holders if the closing sales price of our common stock exceeds \$256.00 per share for the 20 consecutive trading days prior to the date of notice of termination. Because the put right is not transferable, in the event that a put holder has transferred put shares since May 5, 1998, the put right with respect to those shares has terminated. As a consequence of the put right, in the event we are liquidated, holders of shares of common stock that do not have put rights with respect to such shares may receive smaller distributions per share upon our liquidation than if there were no put rights outstanding.

As of July 31, 2020, we had repurchased or received documentation of the transfer of 49,993 put shares and 4,472 of the put shares continued to be held in the name of put holders. We cannot determine at this time what portion of the put rights of the remaining 95,494 put shares have terminated.

*Transfer Agent and Registrar.* Computershare Trust Company, N.A. is transfer agent and registrar for the common stock.

*The Nasdaq Capital Market.* Our common stock is listed on the Nasdaq Capital Market under the symbol “IDRA.”

## **Preferred Stock**

We are authorized to issue 5,000,000 shares of preferred stock, \$0.01 par value per share, of which 1,500,000 has been designated Series A convertible preferred stock, 277,921 has been designated Series B1 redeemable convertible preferred stock, 98,685 has been designated Series B2 redeemable convertible preferred stock, 82,814 has been designated Series B3 redeemable convertible preferred stock, and 82,814 has been designated Series B4 redeemable convertible preferred stock. As of July 31, 2020, there were 655 shares of Series A preferred stock outstanding and 23,684 shares of Series B1 preferred stock outstanding. No other shares of preferred stock were outstanding.

The terms of any series of preferred stock that are offered pursuant to this prospectus will be described in the prospectus supplement relating to that series of preferred stock. The terms of any series of preferred stock may differ from the terms described below. Certain provisions of the preferred stock that may be offered by us pursuant to this prospectus as described below and in any applicable prospectus supplement are not complete.

We are authorized to issue “blank check” preferred stock, which may be issued in one or more series upon authorization of our board of directors. Our board of directors is authorized to fix the designation of the series, the number of authorized shares of the series, dividend rights and terms, conversion rights, voting rights, redemption rights and terms, liquidation preferences and any other rights, powers, preferences and limitations applicable to each series of preferred stock. The authorized shares of our preferred stock are available for issuance without further action by our stockholders, unless such action is required by applicable law or the rules of any stock exchange on which our securities may be listed. If the approval of our stockholders is not required for the issuance of shares of our preferred stock, our board may determine not to seek stockholder approval.

A series of our preferred stock could, depending on the terms of such series, impede the completion of a merger, tender offer or other takeover attempt. Our board of directors will make any determination to issue such preferred shares based upon its judgment as to the best interests of our stockholders. Our directors, in so acting, could issue preferred stock having terms that could discourage an acquisition attempt through which an acquirer may be able to change the composition of our board of directors, including a tender offer or other transaction that some, or a majority, of our stockholders might believe to be in their best interests or in which stockholders might receive a premium for their stock over the then-current market price of the stock.

The preferred stock that is offered pursuant to this prospectus has the terms described below unless otherwise provided in the prospectus supplement relating to a particular series of preferred stock being offered. You should read the prospectus supplement relating to the particular series of preferred stock being offered for specific terms, including:

- the designation and stated value per share of the preferred stock and the number of shares offered;
- the amount of liquidation preference per share, if any;
- the price at which the preferred stock will be issued;

- the dividend rate, or method of calculation of dividends, the dates on which dividends will be payable, whether dividends will be cumulative or noncumulative and, if cumulative, the dates from which dividends will commence to accumulate;
- any redemption or sinking fund provisions;
- if other than the currency of the United States, the currency or currencies including composite currencies in which the preferred stock is denominated and/or in which payments will or may be payable;
- any conversion provisions;
- whether we have elected to offer depositary shares as described under “Description of Depositary Shares;” and
- any other rights, preferences, privileges, limitations and restrictions on the preferred stock.

The preferred stock will, when issued, be fully paid and nonassessable. Unless otherwise specified in the prospectus supplement, each series of preferred stock will rank equally as to dividends and liquidation rights in all respects with each other series of preferred stock that may be issued pursuant to this prospectus. The rights of holders of shares of each series of preferred stock will be subordinate to those of our general creditors.

As described under “Description of Depositary Shares,” we may, at our option, with respect to any series of preferred stock, elect to offer fractional interests in shares of preferred stock, and provide for the issuance of depositary receipts representing depositary shares, each of which will represent a fractional interest in a share of the series of preferred stock. The fractional interest will be specified in the prospectus supplement relating to a particular series of preferred stock.

*Rank.* Unless otherwise specified in the prospectus supplement, the preferred stock will, with respect to dividend rights and rights upon our liquidation, dissolution or winding up of our affairs, rank:

- senior to our common stock and to all equity securities ranking junior to such preferred stock with respect to dividend rights or rights upon our liquidation, dissolution or winding up of our affairs;
- on a parity with all equity securities issued by us, the terms of which specifically provide that such equity securities rank on a parity with the preferred stock with respect to dividend rights or rights upon our liquidation, dissolution or winding up of our affairs; and
- junior to all equity securities issued by us, the terms of which specifically provide that such equity securities rank senior to the preferred stock with respect to dividend rights or rights upon our liquidation, dissolution or winding up of our affairs.

The term “equity securities” does not include convertible debt securities.

*Dividends.* Holders of the preferred stock of each series will be entitled to receive, when, as and if declared by our board of directors, cash dividends at such rates and on such dates described in the prospectus supplement. Different series of preferred stock may be entitled to dividends at different rates or based on different methods of calculation. The dividend rate may be fixed or variable or both. Dividends will be payable to the holders of record as they appear on our stock books on record dates fixed by our board of directors, as specified in the applicable prospectus supplement.

Dividends on any series of preferred stock may be cumulative or noncumulative, as described in the applicable prospectus supplement. If our board of directors does not declare a dividend payable on a dividend payment date on any series of noncumulative preferred stock, then the holders of that noncumulative preferred stock will have no right to receive a dividend for that dividend payment date, and we will have no obligation to pay the dividend accrued for that period, whether or not dividends on that series are declared payable on any future dividend payment dates. Dividends on any series of cumulative preferred stock will accrue from the date we initially issue shares of such series or such other date specified in the applicable prospectus supplement.

No dividends may be declared or paid or funds set apart for the payment of any dividends on any parity securities unless full dividends have been paid or set apart for payment on the preferred stock. If full dividends are not paid, the preferred stock will share dividends pro rata with the parity securities.

No dividends may be declared or paid or funds set apart for the payment of dividends on any junior securities unless full dividends for all dividend periods terminating on or prior to the date of the declaration or payment will have been paid or declared and a sum sufficient for the payment set apart for payment on the preferred stock.

*Liquidation Preference.* Upon any voluntary or involuntary liquidation, dissolution or winding up of our affairs, before we make any distribution or payment to the holders of any common stock or any other class or series of our capital stock ranking junior to the preferred stock in the distribution of assets upon any liquidation, dissolution or winding up of our affairs, the holders of each series of preferred stock shall be entitled to receive out of assets legally available for distribution to stockholders, liquidating distributions in the amount of the liquidation preference per share set forth in the prospectus supplement, plus any accrued and unpaid dividends thereon. Such dividends will not include any accumulation in respect of unpaid noncumulative dividends for prior dividend periods. Unless otherwise specified in the prospectus supplement, after payment of the full amount of their liquidating distributions, the holders of preferred stock will have no right or claim to any of our remaining assets. Upon any such voluntary or involuntary liquidation, dissolution or winding up, if our available assets are insufficient to pay the amount of the liquidating distributions on all outstanding preferred stock and the corresponding amounts payable on all other classes or series of our capital stock ranking on parity with the preferred stock and all other such classes or series of shares of capital stock ranking on parity with the preferred stock in the distribution of assets, then the holders of the preferred stock and all other such classes or series of capital stock will share ratably in any such distribution of assets in proportion to the full liquidating distributions to which they would otherwise be entitled.

Upon any such liquidation, dissolution or winding up and if we have made liquidating distributions in full to all holders of preferred stock, we will distribute our remaining assets among the holders of any other classes or series of capital stock ranking junior to the preferred stock according to their respective rights and preferences and, in each case, according to their respective number of shares. For such purposes, our consolidation or merger with or into any other corporation, trust or entity, or the sale, lease or conveyance of all or substantially all of our property or assets will not be deemed to constitute a liquidation, dissolution or winding up of our affairs.

*Redemption.* If so provided in the applicable prospectus supplement, the preferred stock will be subject to mandatory redemption or redemption at our option, as a whole or in part, in each case upon the terms, at the times and at the redemption prices set forth in such prospectus supplement.

The prospectus supplement relating to a series of preferred stock that is subject to mandatory redemption will specify the number of shares of preferred stock that shall be redeemed by us in each year commencing after a date to be specified, at a redemption price per share to be specified, together with an amount equal to all accrued and unpaid dividends thereon to the date of redemption. Unless the shares have a cumulative dividend, such accrued dividends will not include any accumulation in respect of unpaid dividends for prior dividend periods. We may pay the redemption price in cash or other property, as specified in the applicable prospectus supplement. If the redemption price for preferred stock of any series is payable only from the net proceeds of the issuance of shares of our capital stock, the terms of such preferred stock may provide that, if no such shares of our capital stock shall have been issued or to the extent the net proceeds from any issuance are insufficient to pay in full the aggregate redemption price then due, such preferred stock shall automatically and mandatorily be converted into the applicable shares of our capital stock pursuant to conversion provisions specified in the applicable prospectus supplement. Notwithstanding the foregoing, we will not redeem any preferred stock of a series unless:

- if that series of preferred stock has a cumulative dividend, we have declared and paid or contemporaneously declare and pay or set aside funds to pay full cumulative dividends on the preferred stock for all past dividend periods and the then current dividend period; or
- if such series of preferred stock does not have a cumulative dividend, we have declared and paid or contemporaneously declare and pay or set aside funds to pay full dividends for the then current dividend period.

In addition, we will not acquire any preferred stock of a series unless:

- if that series of preferred stock has a cumulative dividend, we have declared and paid or contemporaneously declare and pay or set aside funds to pay full cumulative dividends on all outstanding shares of such series of preferred stock for all past dividend periods and the then current dividend period; or

- if that series of preferred stock does not have a cumulative dividend, we have declared and paid or contemporaneously declare and pay or set aside funds to pay full dividends on the preferred stock of such series for the then current dividend period.

However, at any time we may purchase or acquire preferred stock of that series (1) pursuant to a purchase or exchange offer made on the same terms to holders of all outstanding preferred stock of such series or (2) by conversion into or exchange for shares of our capital stock ranking junior to the preferred stock of such series as to dividends and upon liquidation.

If fewer than all of the outstanding shares of preferred stock of any series are to be redeemed, we will determine the number of shares that may be redeemed pro rata from the holders of record of such shares in proportion to the number of such shares held or for which redemption is requested by such holder or by any other equitable manner that we determine. Such determination will reflect adjustments to avoid redemption of fractional shares.

Unless otherwise specified in the prospectus supplement, we will mail notice of redemption at least 30 days but not more than 60 days before the redemption date to each holder of record of preferred stock to be redeemed at the address shown on our stock transfer books. Each notice shall state:

- the redemption date;
- the number of shares and series of preferred stock to be redeemed;
- the redemption price;
- the place or places where certificates for such preferred stock are to be surrendered for payment of the redemption price;
- that dividends on the shares to be redeemed will cease to accrue on such redemption date;
- the date on which the holder's conversion rights, if any, as to such shares shall terminate; and
- the specific number of shares to be redeemed from each such holder if fewer than all the shares of any series are to be redeemed.

If notice of redemption has been given and we have set aside the funds necessary for such redemption in trust for the benefit of the holders of any shares called for redemption, then from and after the redemption date, dividends will cease to accrue on such shares, and all rights of the holders of such shares will terminate, except the right to receive the redemption price.

*Voting Rights.* Holders of preferred stock will not have any voting rights, except as required by law or as indicated in the applicable prospectus supplement.

Unless otherwise provided for under the terms of any series of preferred stock, no consent or vote of the holders of shares of preferred stock or any series thereof shall be required for any amendment to our certificate of incorporation that would increase the number of authorized shares of preferred stock or the number of authorized shares of any series thereof or decrease the number of authorized shares of preferred stock or the number of authorized shares of any series thereof (but not below the number of authorized shares of preferred stock or such series, as the case may be, then outstanding).

*Conversion Rights.* The terms and conditions, if any, upon which any series of preferred stock is convertible into our common stock will be set forth in the applicable prospectus supplement relating thereto. Such terms will include the number of shares of common stock into which the shares of preferred stock are convertible, the conversion price, rate or manner of calculation thereof, the conversion period, provisions as to whether conversion will be at our option or at the option of the holders of the preferred stock, the events requiring an adjustment of the conversion price and provisions affecting conversion in the event of the redemption.

*Transfer Agent and Registrar.* We serve as the transfer agent and registrar for our outstanding preferred stock.



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

We have shares of common stock and preferred stock available for future issuance without stockholder approval, subject to any limitations imposed by the listing standards of the Nasdaq Capital Market. We may utilize these additional shares for a variety of corporate purposes, including for future public offerings to raise additional capital, or facilitate corporate acquisitions or for payment as a dividend on our 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 have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a controlling interest in our company by means of a merger, tender offer, proxy contest or otherwise. In addition, if we issue preferred stock, the issuance could adversely affect the voting power of holders of common stock, and the likelihood that such holders will receive dividend payments and payments upon liquidation.

## **Delaware Law and Specified Certificate of Incorporation and Bylaw Provisions**

*Staggered Board.* Our certificate of incorporation and bylaws provide for the division of our board of directors into three classes as nearly equal in size as possible with staggered three-year terms. In addition, our certificate of incorporation and bylaws provide that directors may only be removed for cause and then only by the affirmative vote of the holders of two-thirds of the shares of our capital stock entitled to vote. Under our certificate of incorporation and bylaws, any vacancy on the board of directors, however occurring, including a vacancy resulting from an enlargement of the board, may only be filled by vote of a majority of the directors then in office. The classification of the board of directors and the limitations on the removal of directors and filling of vacancies could have the effect of making it more difficult for a third party to acquire, or of discouraging a third party from acquiring, control of us.

*Stockholder Action; Special Meeting of Stockholders.* Our certificate of incorporation and bylaws provide that stockholders may take action only at a duly called annual or special meeting of stockholders and may not take action by written consent. Our certificate of incorporation and bylaws further provide that special meetings of our stockholders may be called only by a majority of the board of directors or by our chief executive officer or, if the office of chief executive officer is vacant, our president. In no event may our stockholders call a special meeting of stockholders.

*Advance Notice Requirements for Stockholder Proposals and Director Nominations.* Our bylaws provide that stockholders seeking to bring business before an annual meeting of stockholders, or to nominate candidates for election as directors at an annual meeting of stockholders, must meet specified procedural requirements. These provisions may preclude stockholders from bringing matters before an annual meeting of stockholders or from making nominations for directors at an annual or special meeting of stockholders.

*Supermajority Votes Required.* The Delaware General Corporation Law provides generally that the affirmative vote of a majority of the shares entitled to vote on any matter is required to amend a corporation's certificate of incorporation or bylaws, unless a corporation's certificate of incorporation or bylaws, as the case may be, requires a greater percentage. Our certificate of incorporation and bylaws require the affirmative vote of the holders of at least 75% of the shares of our capital stock issued and outstanding and entitled to vote to amend or repeal any of the provisions described in the prior three paragraphs.

*Business Combinations.* We are subject to Section 203 of the Delaware General Corporation Law. Subject to certain exceptions, Section 203 prevents a publicly held Delaware corporation from engaging in a "business combination" with any "interested stockholder" for three years following the date that such person became an interested stockholder, unless either the interested stockholder attained such status with the approval of our board of directors, the business combination is approved by our board of directors and stockholders in a prescribed manner or the interested stockholder acquired at least 85% of our outstanding voting stock in the transaction in which such person became an interested stockholder. A "business combination" includes, among other things, a merger or consolidation involving us and the "interested stockholder" and the sale of more than 10% of our assets. In general, an "interested stockholder" is any entity or person beneficially owning 15% or more of our outstanding voting stock and any entity or person affiliated with or controlling or controlled by such entity or person.

*Directors' Liability.* Our certificate of incorporation limits the personal liability of directors for breach of fiduciary duty to the maximum extent permitted by the Delaware General Corporation Law and provides that no director will have personal liability to us or to our stockholders for monetary damages for breach of fiduciary duty as a director. However, these provisions do not eliminate or limit the liability of any of our directors:

- for any breach of the director's duty of loyalty to us or our stockholders;
- for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- for voting or assenting to unlawful payments of dividends, stock repurchases or other distributions; or
- for any transaction from which the director derived an improper personal benefit.

*Exclusive Forum Charter Provision.* Our certificate of incorporation requires that the Court of Chancery of the State of Delaware will, to the fullest extent permitted by applicable law, be the sole and exclusive forum for the following:

- any derivative action or proceeding brought on behalf of the corporation;
- any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the corporation to the corporation or the corporation's stockholders, creditors or other constituents;
- any action asserting a claim against the corporation arising pursuant to any provision of the Delaware General Corporation Law, the corporation's certificate of incorporation or the bylaws of the corporation; or
- any action asserting a claim against the corporation governed by the internal affairs doctrine, in each such case subject to said Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein.

Provided, that, if and only if the Court of Chancery of the State of Delaware dismisses any of the foregoing actions for lack of subject matter jurisdiction, any such action or actions may be brought in another state court sitting in the State of Delaware. Because the applicability of the exclusive forum provision is limited to the extent permitted by applicable law, we do not intend that the exclusive forum provision would apply to suits brought to enforce any duty or liability created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction, and acknowledge that federal courts have concurrent jurisdiction over all suits brought to enforce any duty or liability created by the Securities Act. We note that there is uncertainty as to whether a court would enforce the provision and that investors cannot waive compliance with the federal securities laws and the rules and regulations thereunder. Although we believe this provision benefits us by providing increased consistency in the application of Delaware law in the types of lawsuits to which it applies, the provision may have the effect of discouraging lawsuits against our directors and officers.

## DESCRIPTION OF DEPOSITARY SHARES

### General

We may, at our option, elect to offer fractional shares of preferred stock, which we call depositary shares, rather than full shares of preferred stock. If we do, we will issue to the public receipts, called depositary receipts, for depositary shares, each of which will represent a fraction, to be described in the applicable prospectus supplement, of a share of a particular series of preferred stock. Unless otherwise provided in the prospectus supplement, each owner of a depositary share will be entitled, in proportion to the applicable fractional interest in a share of preferred stock represented by the depositary share, to all the rights and preferences of the preferred stock represented by the depositary share. Those rights include dividend, voting, redemption, conversion and liquidation rights.

The shares of preferred stock underlying the depositary shares will be deposited with a bank or trust company selected by us to act as depositary under a deposit agreement between us, the depositary and the holders of the depositary receipts. The depositary will be the transfer agent, registrar and dividend disbursing agent for the depositary shares.

The depositary shares will be evidenced by depositary receipts issued pursuant to the deposit agreement. Holders of depositary receipts agree to be bound by the deposit agreement, which requires holders to take certain actions such as filing proof of residence and paying certain charges.

The summary of terms of the depositary shares contained in this prospectus is not a complete description of the terms of the depositary shares. You should refer to the form of the deposit agreement, our certificate of incorporation and the certificate of designation for the applicable series of preferred stock that are, or will be, filed with the SEC.

### Dividends and Other Distributions

The depositary will distribute all cash dividends or other cash distributions, if any, received in respect of the preferred stock underlying the depositary shares to the record holders of depositary shares in proportion to the numbers of depositary shares owned by those holders on the relevant record date. The relevant record date for depositary shares will be the same date as the record date for the underlying preferred stock.

If there is a distribution other than in cash, the depositary will distribute property (including securities) received by it to the record holders of depositary shares, unless the depositary determines that it is not feasible to make the distribution. If this occurs, the depositary may, with our approval, adopt another method for the distribution, including selling the property and distributing the net proceeds from the sale to the holders.

### Liquidation Preference

If a series of preferred stock underlying the depositary shares has a liquidation preference, in the event of the voluntary or involuntary liquidation, dissolution or winding up of us, holders of depositary shares will be entitled to receive the fraction of the liquidation preference accorded each share of the applicable series of preferred stock, as set forth in the applicable prospectus supplement.

### Withdrawal of Stock

Unless the related depositary shares have been previously called for redemption, upon surrender of the depositary receipts at the office of the depositary, the holder of the depositary shares will be entitled to delivery, at the office of the depositary to or upon his or her order, of the number of whole shares of the preferred stock and any money or other property represented by the depositary shares. If the depositary receipts delivered by the holder evidence a number of depositary shares in excess of the number of depositary shares representing the number of whole shares of preferred stock to be withdrawn, the depositary will deliver to the holder at the same time a new depositary receipt evidencing the excess number of depositary shares. In no event will the depositary deliver fractional shares of preferred stock upon surrender of depositary receipts. Holders of preferred stock thus withdrawn may not thereafter deposit those shares under the deposit agreement or receive depositary receipts evidencing depositary shares therefor.

## **Redemption of Depositary Shares**

Whenever we redeem shares of preferred stock held by the depositary, the depositary will redeem as of the same redemption date the number of depositary shares representing shares of the preferred stock so redeemed, so long as we have paid in full to the depositary the redemption price of the preferred stock to be redeemed plus an amount equal to any accumulated and unpaid dividends on the preferred stock to the date fixed for redemption. The redemption price per depositary share will be equal to the redemption price and any other amounts per share payable on the preferred stock multiplied by the fraction of a share of preferred stock represented by one depositary share. If less than all the depositary shares are to be redeemed, the depositary shares to be redeemed will be selected by lot or pro rata or by any other equitable method as may be determined by the depositary.

After the date fixed for redemption, depositary shares called for redemption will no longer be deemed to be outstanding and all rights of the holders of depositary shares will cease, except the right to receive the monies payable upon redemption and any money or other property to which the holders of the depositary shares were entitled upon redemption upon surrender to the depositary of the depositary receipts evidencing the depositary shares.

## **Voting the Preferred Stock**

Upon receipt of notice of any meeting at which the holders of the preferred stock are entitled to vote, the depositary will mail the information contained in the notice of meeting to the record holders of the depositary receipts relating to that preferred stock. The record date for the depositary receipts relating to the preferred stock will be the same date as the record date for the preferred stock. Each record holder of the depositary shares on the record date will be entitled to instruct the depositary as to the exercise of the voting rights pertaining to the number of shares of preferred stock represented by that holder's depositary shares. The depositary will endeavor, insofar as practicable, to vote the number of shares of preferred stock represented by the depositary shares in accordance with those instructions, and we will agree to take all action that may be deemed necessary by the depositary in order to enable the depositary to do so. The depositary will not vote any shares of preferred stock except to the extent it receives specific instructions from the holders of depositary shares representing that number of shares of preferred stock.

## **Charges of Depositary**

We will pay all transfer and other taxes and governmental charges arising solely from the existence of the depositary arrangements. We will pay charges of the depositary in connection with the initial deposit of the preferred stock and any redemption of the preferred stock. Holders of depositary receipts will pay transfer, income and other taxes and governmental charges and such other charges (including those in connection with the receipt and distribution of dividends, the sale or exercise of rights, the withdrawal of the preferred stock and the transferring, splitting or grouping of depositary receipts) as are expressly provided in the deposit agreement to be for their accounts. If these charges have not been paid by the holders of depositary receipts, the depositary may refuse to transfer depositary shares, withhold dividends and distributions and sell the depositary shares evidenced by the depositary receipt.

## **Amendment and Termination of the Deposit Agreement**

The form of depositary receipt evidencing the depositary shares and any provision of the deposit agreement may be amended by agreement between us and the depositary. However, any amendment that materially and adversely alters the rights of the holders of depositary shares, other than fee changes, will not be effective unless the amendment has been approved by the holders of a majority of the outstanding depositary shares. The deposit agreement may be terminated by the depositary or us only if:

- all outstanding depositary shares have been redeemed; or
- there has been a final distribution of the preferred stock in connection with our dissolution and such distribution has been made to all the holders of depositary shares.

### **Resignation and Removal of Depositary**

The depositary may resign at any time by delivering to us notice of its election to do so, and we may remove the depositary at any time. Any resignation or removal of the depositary will take effect upon our appointment of a successor depositary and its acceptance of such appointment. The successor depositary must be appointed within 60 days after delivery of the notice of resignation or removal and must be a bank or trust company having its principal office in the United States and having the requisite combined capital and surplus as set forth in the applicable agreement.

### **Notices**

The depositary will forward to holders of depositary receipts all notices, reports and other communications, including proxy solicitation materials received from us, that are delivered to the depositary and that we are required to furnish to the holders of the preferred stock. In addition, the depositary will make available for inspection by holders of depositary receipts at the principal office of the depositary, and at such other places as it may from time to time deem advisable, any reports and communications we deliver to the depositary as the holder of preferred stock.

### **Limitation of Liability**

Neither we nor the depositary will be liable if we or it is prevented or delayed by law or any circumstance beyond its control in performing its obligations. Our obligations and those of the depositary will be limited to performance in good faith of our and their duties thereunder. We and the depositary will not be obligated to prosecute or defend any legal proceeding in respect of any depositary shares or preferred stock unless satisfactory indemnity is furnished. We and the depositary may rely upon written advice of counsel or accountants, on information provided by persons presenting preferred stock for deposit, holders of depositary receipts or other persons believed to be competent to give such information and on documents believed to be genuine and to have been signed or presented by the proper party or parties.

## DESCRIPTION OF WARRANTS

We may issue warrants to purchase common stock, preferred stock or depositary shares. We may offer warrants separately or together with one or more additional warrants, common stock, preferred stock or depositary shares, or any combination of those securities, as described in the applicable prospectus supplement. The applicable prospectus supplement will also describe the following terms of any warrants:

- the specific designation and aggregate number of, and the offering price at which we will issue, the warrants;
- the currency or currency units in which the offering price, if any, and the exercise price are payable;
- the date on which the right to exercise the warrants will begin and the date on which that right will expire or, if you may not continuously exercise the warrants throughout that period, the specific date or dates on which you may exercise the warrants;
- whether the warrants are to be sold separately or with other securities;
- whether the warrants will be issued in definitive or global form or in any combination of these forms;
- any applicable material U.S. federal income tax consequences;
- the identity of the warrant agent for the warrants and of any other depositaries, execution or paying agents, transfer agents, registrars or other agents;
- the proposed listing, if any, of the warrants or any securities purchasable upon exercise of the warrants on any securities exchange;
- the designation and terms of any equity securities purchasable upon exercise of the warrants;
- if applicable, the designation and terms of the preferred stock or depositary shares with which the warrants are issued and the number of warrants issued with each security;
- the number of shares of common stock, the number of shares of preferred stock or the number of depositary shares purchasable upon exercise of a warrant and the price at which those shares may be purchased;
- if applicable, the minimum or maximum amount of the warrants that may be exercised at any one time;
- information with respect to book-entry procedures, if any;
- the anti-dilution provisions of, and other provisions for changes to or adjustment in the exercise price of, the warrants, if any;
- any redemption or call provisions; and
- any additional terms of the warrants, including terms, procedures and limitations relating to the exchange or exercise of the warrants.

## FORMS OF SECURITIES

Each depositary share and warrant will be represented either by a certificate issued in definitive form to a particular investor or by one or more global securities representing the entire issuance of securities. Unless the applicable prospectus supplement provides otherwise, certificated securities in definitive form and global securities will be issued in registered form. Definitive securities name you or your nominee as the owner of the security, and in order to transfer or exchange these securities or to receive payments other than interest or other interim payments, you or your nominee must physically deliver the securities to the registrar or other agent, as applicable. Global securities name a depositary or its nominee as the owner of the depositary shares or warrants represented by these global securities. The depositary maintains a computerized system that will reflect each investor's beneficial ownership of the securities through an account maintained by the investor with its broker/dealer, bank, trust company or other representative, as we explain more fully below.

### Global Securities

We may issue the depositary shares and warrants in the form of one or more fully registered global securities that will be deposited with a depositary or its nominee identified in the applicable prospectus supplement and registered in the name of that depositary or nominee. In those cases, one or more global securities will be issued in a denomination or aggregate denominations equal to the portion of the aggregate principal or face amount of the securities to be represented by global securities. Unless and until it is exchanged in whole for securities in definitive registered form, a global security may not be transferred except as a whole by and among the depositary for the global security, the nominees of the depositary or any successors of the depositary or those nominees.

If not described below, any specific terms of the depositary arrangement with respect to any securities to be represented by a global security will be described in the prospectus supplement relating to those securities. We anticipate that the following provisions will apply to all depositary arrangements.

Ownership of beneficial interests in a global security will be limited to persons, called participants, that have accounts with the depositary or persons that may hold interests through participants. Upon the issuance of a global security, the depositary will credit, on its book-entry registration and transfer system, the participants' accounts with the respective principal or face amounts of the securities beneficially owned by the participants. Any dealers, underwriters or agents participating in the distribution of the securities will designate the accounts to be credited. Ownership of beneficial interests in a global security will be shown on, and the transfer of ownership interests will be effected only through, records maintained by the depositary, with respect to interests of participants, and on the records of participants, with respect to interests of persons holding through participants. The laws of some states may require that some purchasers of securities take physical delivery of these securities in definitive form. These laws may impair your ability to own, transfer or pledge beneficial interests in global securities.

So long as the depositary, or its nominee, is the registered owner of a global security, that depositary or its nominee, as the case may be, will be considered the sole owner or holder of the securities represented by the global security for all purposes under the applicable deposit agreement or warrant agreement. Except as described below, owners of beneficial interests in a global security will not be entitled to have the securities represented by the global security registered in their names, will not receive or be entitled to receive physical delivery of the securities in definitive form and will not be considered the owners or holders of the securities under the applicable deposit agreement or warrant agreement. Accordingly, each person owning a beneficial interest in a global security must rely on the procedures of the depositary for that global security and, if that person is not a participant, on the procedures of the participant through which the person owns its interest, to exercise any rights of a holder under the applicable deposit agreement or warrant agreement. We understand that under existing industry practices, if we request any action of holders or if an owner of a beneficial interest in a global security desires to give or take any action that a holder is entitled to give or take under the applicable deposit agreement or warrant agreement, the depositary for the global security would authorize the participants holding the relevant beneficial interests to give or take that action, and the participants would authorize beneficial owners owning through them to give or take that action or would otherwise act upon the instructions of beneficial owners holding through them.

Any payments to holders with respect to depositary shares or warrants represented by a global security registered in the name of a depositary or its nominee will be made to the depositary or its nominee, as the case may be, as the registered owner of the global security. None of us, or any warrant agent or other agent of ours, or any agent of any warrant agent will have any responsibility or liability for any aspect of the records relating to payments made on account of beneficial ownership interests in the global security or for maintaining, supervising or reviewing any records relating to those beneficial ownership interests.

We expect that the depositary for any of the securities represented by a global security, upon receipt of any payment to holders or other distribution of underlying securities or other property on that registered global security, will immediately credit participants' accounts in amounts proportionate to their respective beneficial interests in that global security as shown on the records of the depositary. We also expect that payments by participants to owners of beneficial interests in a global security held through participants will be governed by standing customer instructions and customary practices, as is now the case with the securities held for the accounts of customers or registered in "street name," and will be the responsibility of those participants.

If the depositary for any of the securities represented by a global security is at any time unwilling or unable to continue as depositary or ceases to be a clearing agency registered under the Exchange Act, and a successor depositary registered as a clearing agency under the Exchange Act is not appointed by us within 90 days, we will issue securities in definitive form in exchange for the global security that had been held by the depositary. Any securities issued in definitive form in exchange for a global security will be registered in the name or names that the depositary gives to the relevant warrant agent or other relevant agent of ours or theirs. It is expected that the depositary's instructions will be based upon directions received by the depositary from participants with respect to ownership of beneficial interests in the global security that had been held by the depositary.



## PLAN OF DISTRIBUTION

We may sell securities:

- through underwriters;
- through dealers;
- through agents;
- directly to purchasers; or
- through a combination of any of these methods of sale.

In addition, we may issue the securities as a dividend or distribution or in a subscription rights offering to our existing security holders. This prospectus may be used in connection with any offering of our securities through any of these methods or other methods described in the applicable prospectus supplement.

We may directly solicit offers to purchase securities, or agents may be designated to solicit such offers. We will, in the prospectus supplement relating to such offering, name any agent that could be viewed as an underwriter under the Securities Act, and describe any commissions that we must pay. Any such agent will be acting on a best efforts basis for the period of its appointment or, if indicated in the applicable prospectus supplement, on a firm commitment basis.

The distribution of the securities may be effected from time to time in one or more transactions:

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

Each prospectus supplement will describe the method of distribution of the securities and any applicable restrictions.

The prospectus supplement with respect to the securities of a particular series will describe the terms of the offering of the securities, including the following:

- the name of the agent or any underwriters;
- the public offering or purchase price and the proceeds we will receive from the sale of the securities;
- any discounts and commissions to be allowed or re-allowed or paid to the agent or underwriters;
- all other items constituting underwriting compensation;
- any discounts and commissions to be allowed or re-allowed or paid to dealers; and
- any exchanges on which the securities will be listed.

If any underwriters or agents are utilized in the sale of the securities in respect of which this prospectus is delivered, we will enter into an underwriting agreement or other agreement with them at the time of sale to them, and we will set forth in the prospectus supplement relating to such offering the names of the underwriters or agents and the terms of the related agreement with them. The securities will be acquired by the underwriters for their own accounts and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. Any initial public offering price and any discounts or concessions allowed or reallocated or paid to dealers may be changed from time to time.

If a dealer is utilized in the sale of the securities in respect of which this prospectus is delivered, we will sell such securities to the dealer, as principal. The dealer may then resell such securities to the public at varying prices to be determined by such dealer at the time of resale. The name of the dealer and the terms of the transaction will be identified in the applicable prospectus supplement.

If an agent is used in an offering of securities being offered by this prospectus, the agent will be named, and the terms of the agency will be described, in the applicable prospectus supplement relating to the offering. Unless otherwise indicated in the prospectus supplement, an agent will act on a best efforts basis for the period of its appointment.

If we offer securities in a subscription rights offering to our existing security holders, we may enter into a standby underwriting agreement with dealers, acting as standby underwriters. We may pay the standby underwriters a commitment fee for the securities they commit to purchase on a standby basis. If we do not enter into a standby underwriting arrangement, we may retain a dealer-manager to manage a subscription rights offering for us.

Remarketing firms, agents, underwriters, dealers and other persons may be entitled under agreements which they may enter into with us to indemnification by us against certain civil liabilities, including liabilities under the Securities Act, and may be customers of, engage in transactions with or perform services for us in the ordinary course of business.

If so indicated in the applicable prospectus supplement, we will authorize underwriters or other persons acting as our agents to solicit offers by certain institutions to purchase securities from us pursuant to delayed delivery contracts providing for payment and delivery on the date stated in the prospectus supplement. Each contract will be for an amount not less than, and the aggregate amount of securities sold pursuant to such contracts shall not be less nor more than, the respective amounts stated in the prospectus supplement. Institutions with whom the contracts, when authorized, may be made include commercial and savings banks, insurance companies, pension funds, investment companies, educational and charitable institutions and other institutions, but shall in all cases be subject to our approval. Delayed delivery contracts will not be subject to any conditions except that:

- the purchase by an institution of the securities covered under that contract shall not at the time of delivery be prohibited under the laws of the jurisdiction to which that institution is subject; and
- if the securities are also being sold to underwriters acting as principals for their own account, the underwriters shall have purchased such securities not sold for delayed delivery. The underwriters and other persons acting as our agents will not have any responsibility in respect of the validity or performance of delayed delivery contracts.

Certain agents, underwriters and dealers, and their associates and affiliates may be customers of, have borrowing relationships with, engage in other transactions with, and/or perform services, including investment banking services, for us or one or more of our respective affiliates in the ordinary course of business.

In order to facilitate the offering of the securities, any underwriters may engage in transactions that stabilize, maintain or otherwise affect the price of the securities or any other securities the prices of which may be used to determine payments on such securities. Specifically, any underwriters may overallocate in connection with the offering, creating a short position for their own accounts. In addition, to cover overallocations or to stabilize the price of the securities or of any such other securities, the underwriters may bid for, and purchase, the securities or any such other securities in the open market. Finally, in any offering of the securities through a syndicate of underwriters, the underwriting syndicate may reclaim selling concessions allowed to an underwriter or a dealer for distributing the securities in the offering if the syndicate repurchases previously distributed securities in transactions to cover syndicate short positions, in stabilization transactions or otherwise. Any of these activities may stabilize or maintain the market price of the securities above independent market levels. Any such underwriters are not required to engage in these activities and may end any of these activities at any time.

Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in three business days, unless the parties to any such trade expressly agree otherwise. The applicable prospectus supplement may provide that the original issue date for your securities may be more than three scheduled business days after the trade date for your securities. Accordingly, in such a case, if you wish to trade securities on any date prior to the third business day before the original issue date for your securities, you will be required, by virtue of the fact that your securities initially are expected to settle more than three scheduled business days after the trade date for your securities, to make alternative settlement arrangements to prevent a failed settlement.

The securities may be new issues of securities and may have no established trading market. The securities may or may not be listed on a national securities exchange. We can make no assurance as to the liquidity of or the existence of trading markets for any of the securities.

In compliance with the guidelines of the Financial Industry Regulatory Authority, or FINRA, the aggregate maximum discount, commission or agency fees or other items constituting underwriting compensation to be received by any FINRA member or independent broker-dealer will not exceed 8% of the proceeds from any offering pursuant to this prospectus and any applicable prospectus supplement.

## LEGAL MATTERS

Unless the applicable prospectus supplement indicates otherwise, the validity of the securities in respect of which this prospectus is being delivered will be passed upon by Morgan, Lewis & Bockius LLP, Pittsburgh, Pennsylvania.

## EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our financial statements included in our [Annual Report on Form 10-K for the year ended December 31, 2019](#) and the effectiveness of our internal control over financial reporting as of December 31, 2019, as set forth in their reports (which contain an explanatory paragraph describing conditions that raise substantial doubt about the Company's ability to continue as a going concern as described in Note 1 to the financial statements), which are incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on Ernst & Young LLP's reports, given on their authority as experts in accounting and auditing.

## PART II

### INFORMATION NOT REQUIRED IN PROSPECTUS

#### Item 14. Other Expenses of Issuance and Distribution.

Set forth below are estimates (except in the case of the SEC registration fee) of the amount of fees and expenses to be incurred in connection with the issuance and distribution of the offered securities, other than underwriting discounts and commissions.

SEC registration fee	\$ 19,470
Printing and engraving	*
Legal fees and expenses	*
Accounting fees and expenses	*
Miscellaneous expenses	*
Total expenses	*

\* Estimated expenses are not presently known. The foregoing sets forth the general categories of expenses (other than underwriting discounts and commissions) that we anticipate we will incur in connection with the offering of securities under this registration statement. An estimate of the aggregate expenses in connection with the issuance and distribution of the securities being offered will be included in the applicable prospectus supplement.

#### Item 15. Indemnification of Directors and Officers.

Section 102 of the Delaware General Corporation Law allows a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit.

Section 145 of the Delaware General Corporation Law provides that a corporation has the power to indemnify a director, officer, employee or agent of the corporation and certain other persons serving at the request of the corporation in related capacities against amounts paid and expenses incurred in connection with an action or proceeding to which he is or is threatened to be made a party by reason of such position, if such person shall have acted in good faith and in a manner he reasonably believed to be in, or not opposed to, the best interests of the corporation, and, in any criminal proceeding, if such person had no reasonable cause to believe his conduct was unlawful; provided that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the adjudicating court determines that such indemnification is proper under the circumstances.

Article EIGHTH of the registrant's Restated Certificate of Incorporation, as amended (the "Certificate of Incorporation") provides that no director of the registrant shall be personally liable for any monetary damages for any breach of fiduciary duty as a director, except to the extent that the Delaware General Corporation Law prohibits the elimination or limitation of liability of directors for breach of fiduciary duty.

Article NINTH of the Certificate of Incorporation provides that a director or officer of the registrant (a) shall be indemnified by the registrant against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement incurred in connection with any litigation or other legal proceeding (other than an action by or in the right of the registrant) brought against him by virtue of his position as a director or officer of the registrant if he acted in good faith and in a manner he reasonably believed to be in, or not opposed to, the best interests of the registrant, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful and (b) shall be indemnified by the registrant against all expense (including attorneys' fees) and amounts paid in settlement incurred in connection with any action by or in the right of the registrant brought against him by virtue of his position as a director or officer of the registrant if he acted in good faith and in a manner he reasonably believed to be in, or not opposed to, the best interests of the registrant, except that no indemnification shall be made with respect to any matter as to which such person shall have been adjudged to be liable to the registrant, unless a court determines that, despite such adjudication but in view of all of the circumstances, he is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that a director or officer has been successful, on the merits or otherwise, including, without limitation, the dismissal of an action without prejudice, he is required to be indemnified by the registrant against all expenses (including attorneys' fees) incurred in connection therewith. Expenses shall be advanced to a director or officer at his request, provided that he undertakes to repay the amount advanced if it is ultimately determined that he is not entitled to indemnification for such expenses.

Indemnification is required to be made unless the registrant determines that the applicable standard of conduct required for indemnification has not been met. In the event of a determination by the registrant that the director or officer did not meet the applicable standard of conduct required for indemnification, or if the registrant fails to make an indemnification payment within 60 days after such payment is claimed by such person, such person is permitted to petition the court to make an independent determination as to whether such person is entitled to indemnification. As a condition precedent to the right of indemnification, the director or officer must give the registrant notice of the action for which indemnity is sought and the registrant has the right to participate in such action or assume the defense thereof.

Article NINTH of the Certificate of Incorporation further provides that the indemnification provided therein is not exclusive, and provides that in the event that the Delaware General Corporation Law is amended to expand the indemnification permitted to directors or officers the registrant must indemnify those persons to the full extent permitted by such law as so amended.

The registrant has obtained directors and officers insurance for the benefit of its directors and its officers.

The registrant has entered into indemnification agreements with its directors and officers. In general, these agreements provide that the registrant will indemnify the director or officer to the fullest extent permitted by law for claims arising in his or her capacity as a director or officer of the registrant or in connection with their service at the registrant's request for another corporation or entity. The indemnification agreements also provide for procedures that will apply in the event that a director or officer makes a claim for indemnification and establish certain presumptions that are favorable to the director or officer.

#### **Item 16. Exhibits**

The exhibits to this registration statement are listed in the Exhibit Index to this registration statement and are incorporated herein by reference.

#### **Item 17. Undertakings.**

The undersigned registrant hereby undertakes:

- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:
  - (i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933, as amended (the "Securities Act");

- (ii) To reflect in the prospectus any facts or events arising after the effective date of this registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and
- (iii) To include any material information with respect to the plan of distribution not previously disclosed in this registration statement or any material change to such information in this registration statement;

*provided, however*, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), that are incorporated by reference in this registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of this registration statement.

- (2) That, for the purposes of determining any liability under the Securities Act, each post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at the time shall be deemed to be the initial *bona fide* offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (4) That, for the purpose of determining liability under the Securities Act to any purchaser, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A (§230.430A of this chapter), shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.
- (5) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in this registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.
- (6) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the indemnification provisions described herein, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

- (7) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant hereby undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:
- (i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;
  - (ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
  - (iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and
  - (iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.



**EXHIBIT INDEX**

EXHIBIT NUMBER	DESCRIPTION
1.1*	Form of Underwriting Agreement
<a href="#">4.1</a>	<a href="#">Restated Certificate of Incorporation of the Registrant, as amended (incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q filed on August 2, 2018)</a>
<a href="#">4.2</a>	<a href="#">Certificate of Amendment to Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed on May 18, 2020)</a>
<a href="#">4.3</a>	<a href="#">Amended and Restated By-laws of the Registrant (incorporated by reference to Exhibit 3.2 to the Registrant's Annual Report on Form 10-K filed on March 7, 2018)</a>
4.4*	Form of Deposit Agreement
4.5*	Form of Warrant Agreement
<a href="#">5.1**</a>	<a href="#">Opinion of Morgan, Lewis &amp; Bockius LLP</a>
<a href="#">23.1**</a>	<a href="#">Consent of Ernst &amp; Young LLP</a>
<a href="#">23.2**</a>	<a href="#">Consent of Morgan, Lewis &amp; Bockius LLP (included in Exhibit 5.1 filed herewith)</a>
<a href="#">24.1**</a>	<a href="#">Power of Attorney (included on the signature page of this registration statement)</a>

\*To be filed by amendment or by a Current Report on Form 8-K.

\*\* Filed herewith.

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Exton, Commonwealth of Pennsylvania, on August 4, 2020.

### IDERA PHARMACEUTICALS, INC.

By: /s/ VINCENT J. MILANO

Vincent J. Milano

President and Chief Executive Officer

## POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that the undersigned officers and directors Idera Pharmaceuticals, Inc., a Delaware corporation (the "Corporation"), hereby constitute and appoint each of Vincent J. Milano and John J. Kirby the true and lawful agents and attorneys-in-fact of the undersigned with full power and authority in said agents and attorneys-in-fact, and in any one or more of them, to sign for the undersigned and in their respective names as an officer/director of the Corporation, any and all amendments (including post-effective amendments) to this registration statement on Form S-3 (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act) and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, and with full power of substitution, hereby ratifying and confirming all that each of said attorneys-in-fact, or his substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ VINCENT J. MILANO</u> Vincent J. Milano	President, Chief Executive Officer and Director (Principal Executive Officer)	August 4, 2020
<u>/s/ JOHN J. KIRBY</u> John J. Kirby	Chief Financial Officer (Principal Financial and Accounting Officer)	August 4, 2020
<u>/s/ JAMES A. GERAGHTY</u> James A. Geraghty	Chairman of the Board of Directors	August 4, 2020
<u>/s/ CRISTINA CSIMMA</u> Cristina Csimma, Pharm.D., M.H.P.	Director	August 4, 2020
<u>/s/ MICHAEL DOUGHERTY</u> Michael Dougherty	Director	August 4, 2020
<u>/s/ MARK GOLDBERG</u> Mark Goldberg, M.D.	Director	August 4, 2020
<u>/s/ MAXINE GOWEN</u> Maxine Gowen, Ph.D.	Director	August 4, 2020
<u>Howard H. Pien</u>	Director	
<u>/s/ CAROL A. SCHAFER</u> Carol A. Schafer	Director	August 4, 2020

August 4, 2020

Idera Pharmaceuticals, Inc.  
505 Eagleview Blvd., Suite 212  
Exton, Pennsylvania 19341

Re: Idera Pharmaceuticals, Inc., Registration Statement on Form S-3

Ladies and Gentlemen:

We have acted as counsel for Idera Pharmaceuticals, Inc., a Delaware corporation (the "Company"), in connection with its filing of a Registration Statement on Form S-3 under the Securities Act of 1933, as amended (the "Act"), with the Securities and Exchange Commission (the "Commission") on the date hereof (the "Registration Statement"). The Registration Statement relates to the proposed offer and sale by the Company from time to time, in one or more offerings, as set forth in the prospectus contained in the Registration Statement (the "Prospectus") and as shall be set forth in one or more supplements to the Prospectus (each, a "Prospectus Supplement"), of up to \$150,000,000 of securities (the "Securities"), which may include any or all of the following: (i) shares of common stock, \$0.001 par value per share, of the Company (the "Common Stock"); (ii) shares of one or more series of preferred stock, \$0.01 par value per share, of the Company (the "Preferred Stock"); (iii) depository shares representing a fractional interest in a share of Preferred Stock of the Company ("Depository Shares"); (iv) warrants to purchase shares of Common Stock, Preferred Stock or Depository Shares (the "Warrants"); or (v) any combination of the Securities described in clauses (i) – (iv).

This opinion letter is furnished in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Act.

In connection with this opinion letter, we have examined the Registration Statement and originals, or copies certified or otherwise identified to our satisfaction, of (i) the Restated Certificate of Incorporation of the Company, as amended to date (the "Certificate of Incorporation"), (ii) the Amended and Restated By-Laws of the Company, as amended to date (the "Bylaws"), (iii) certain resolutions of the Company's Operating Committee of the Board of Directors relating to the Registration Statement, and (iv) such other documents, records and other instruments as we have deemed appropriate for purposes of the opinions set forth herein.

We have assumed the genuineness of all signatures, the legal capacity of all natural persons, the authenticity of the documents submitted to us as originals, the conformity with the originals of all documents submitted to us as certified, facsimile or photostatic copies and the authenticity of the originals of all documents submitted to us as copies. With respect to matters of fact relevant to our opinions as set forth below, we have relied upon certificates of officers of the Company, representations made by the Company in documents examined by us, and representations of officers of the Company. We have also obtained and relied upon such certificates and assurances from public officials as we have deemed necessary for the purposes of our opinions set forth below.

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For the purpose of the opinions set forth below, we have also assumed, without independent investigation or verification, that:

- A. the issuance, sale, number or amount, as the case may be, and terms of Securities to be offered from time to time will be duly authorized and established by the authorizing resolutions of the Board of Directors of the Company, in accordance with the Certificate of Incorporation and the Bylaws, and applicable Delaware law (each, a "Corporate Action"), and will not conflict with or constitute a breach of the terms of any agreement or instrument to which the Company is subject;
  - B. prior to the issuance of shares of one or more series of Preferred Stock, an appropriate certificate of designation relating to each such series of Preferred Stock will have been duly authorized by Corporate Action and filed with the Secretary of State of the State of Delaware;
  - C. any Depositary Shares will be issued under one or more depositary agreements (each, a "Depositary Agreement") between the Company and a depositary identified in the Depositary Agreement as a depositary (each, a "Depositary");
  - D. to the extent that the obligations of the Company under any Depositary Agreement may depend upon such matters, the Depositary with respect to such Depositary Agreement will be duly organized, validly existing and in good standing under the laws of its jurisdiction of organization; such Depositary will be duly qualified to engage in the activities contemplated by such Depositary Agreement; such Depositary Agreement will be duly authorized, executed and delivered by such Depositary and will constitute the legal, valid and binding obligation of such Depositary, enforceable against such Depositary in accordance with its terms; such Depositary will be in compliance, generally and with respect to acting as a Depositary under such Depositary Agreement, with all applicable laws and regulations; and such Depositary will have the requisite organizational and legal power and authority to perform its obligations under such Depositary Agreement;
  - E. any Warrants will be issued under one or more warrant agreements (each, a "Warrant Agreement") between the Company and either the purchaser(s) of such warrant or a financial institution identified in the Warrant Agreement as a warrant agent (each, a "Warrant Agent"); and that the execution, delivery and performance of the applicable Warrant Agreement will be duly authorized by Corporate Action, and will not conflict with or constitute a breach of the terms of any agreement or instrument to which the Company is subject;
  - F. to the extent that the obligations of the Company under any Warrant Agreement may depend upon such matters, (i) each of the parties thereto, other than the Company, will be (A) duly organized, validly existing and in good standing under the laws of its jurisdiction of organization and (B) will be duly qualified to engage in the activities contemplated by such Warrant Agreement; (ii) that such Warrant Agreement will have been duly authorized, executed and delivered by such party and will constitute the legal, valid and binding obligation of such party, enforceable against such party in accordance with its terms; (iii) that such party will be in compliance, generally and with respect to acting as a party with respect to its obligations under such Warrant Agreement, with all applicable laws and regulations; and (iv) that such party will have the requisite organizational and legal power and authority to perform its obligations under such Warrant Agreement;
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- G. the Registration Statement and any amendments thereto (including post-effective amendments) will have become effective and such effectiveness shall not have been terminated or rescinded and will comply with all applicable federal and state laws at the time the Securities are offered and issued as contemplated by the Registration Statement;
- H. a Prospectus Supplement will have been prepared, delivered (including through compliance with Rule 172 of the General Rules and Regulations promulgated under the Act) and filed with the Commission describing the Securities offered thereby and will comply with all applicable laws at the time the Securities are offered and issued as contemplated by the Registration Statement;
- I. all Securities will be issued and sold in compliance with applicable federal and state securities laws; and
- J. a definitive purchase, underwriting or similar agreement (each, a "Definitive Agreement") with respect to any Securities offered or issued will have been duly authorized and validly executed and delivered by the Company and the other parties thereto.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof:

- 1. Upon due authorization by Corporate Action of the issuance and sale of shares of Common Stock and upon issuance and delivery of such shares of Common Stock against payment of consideration for such shares (in an amount at least equal to the aggregate par value of such shares of Common Stock) in accordance with the terms and provisions of the applicable Definitive Agreement, the terms of the Corporate Action and as contemplated by the Registration Statement and the applicable Prospectus Supplement, and, if applicable, upon the conversion, exchange or exercise of any other Securities in accordance with their respective terms, the terms of the Corporate Action and as contemplated by the Registration Statement and the applicable Prospectus Supplement (which shall, in each case, provide for payment of consideration that shall be at least equal to the aggregate par value of such shares of Common Stock), such shares of Common Stock will be validly issued, fully paid and nonassessable.
  - 2. Upon due authorization by Corporate Action of the issuance and sale of shares of a series of Preferred Stock and upon issuance and delivery of such shares of Preferred Stock against payment of consideration for such shares (in an amount at least equal to the aggregate par value of such shares of Preferred Stock) in accordance with the terms and provisions of the applicable Definitive Agreement, the terms of the Corporate Action and as contemplated by the Registration Statement and the applicable Prospectus Supplement, and, if applicable, upon the conversion, exchange or exercise of any other Securities in accordance with their respective terms, the terms of the Corporate Action and as contemplated by the Registration Statement and the applicable Prospectus Supplement (which shall, in either case, provide for payment of consideration at least equal to the aggregate par value of such shares of Preferred Stock), such shares of such series of Preferred Stock will be validly issued, fully paid and nonassessable.
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3. When the specific terms of a particular issuance of Depositary Shares have been duly authorized by all requisite Corporate Action and in accordance with the applicable Depositary Agreement, the Depositary Shares evidenced by depositary receipts are duly executed, issued and delivered in accordance with the terms of such Depositary Agreement against the deposit of duly authorized, validly issued, fully paid and nonassessable shares of Preferred Stock, and in accordance with the terms and provisions of the applicable Definitive Agreement, the terms of the requisite Corporate Action and as contemplated by the Registration Statement and the applicable Prospectus Supplement, and, if applicable, upon the conversion, exchange or exercise of any other Securities in accordance with their respective terms, the terms of the requisite Corporate Action and as contemplated by the Registration Statement and the applicable Prospectus Supplement, such Depositary Shares will be legally issued and will entitle the holders thereof to the rights specified in the Depositary Agreement.
4. When a Warrant Agreement providing for the specific terms of a particular issuance of Warrants has been duly authorized by Corporate Action and has been duly executed and delivered by the Company and the Warrant Agent named in such Warrant Agreement and such Warrants, conforming to the requirements of such Warrant Agreement, have been duly countersigned or authenticated, as required, by such Warrant Agent and duly executed and delivered by the Company against payment for such Warrants in accordance with the terms and provisions of such Warrant Agreement and applicable Definitive Agreements and the terms of the Corporate Action, and as contemplated by the Registration Statement and the applicable Prospectus Supplement, such Warrants will be valid and binding obligations of the Company.

The opinion set forth above may be limited by (i) the effects of bankruptcy, insolvency, reorganization, fraudulent conveyance, moratorium or other similar laws now or hereafter in effect relating to or affecting the rights or remedies of creditors generally; (ii) the effect of general principles of equity, whether enforcement is considered in a proceeding in equity or at law, and the discretion of the court before which any proceeding therefor may be brought; and (iii) the unenforceability under certain circumstances under law or court decisions of provisions providing for the indemnification of or contribution to a party with respect to a liability where such indemnification or contribution is contrary to public policy.

The foregoing opinions are limited to the General Corporation Law of the State of Delaware and the federal laws of the United States of America and we express no opinion with respect to the laws of any other state or jurisdiction. Although the Securities may be issued from time to time on a delayed or continuous basis, the opinions expressed herein are limited to the laws, including rules and regulations, as in effect on the date hereof.

We hereby consent to the use of this opinion as Exhibit 5.1 to the Registration Statement and to the reference to us under the caption "Legal Matters" in the Prospectus and to the references to us in the Registration Statement. In giving such consents, we do not hereby admit that we are acting within the category of persons whose consent is required under Section 7 of the Act or the rules or regulations of the Commission thereunder.

Sincerely,

/s/ Morgan, Lewis & Bockius LLP

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**Consent of Independent Registered Public Accounting Firm**

We consent to the reference to our firm under the caption “Experts” in the Registration Statement (Form S-3) and related Prospectus of Idera Pharmaceuticals, Inc. for the registration of up to \$150,000,000 in shares of its common stock, preferred stock, depositary shares, and warrants and to the incorporation by reference therein of our reports dated March 11, 2020, with respect to the financial statements of Idera Pharmaceuticals, Inc., and the effectiveness of internal control over financial reporting of Idera Pharmaceuticals, Inc., included in its Annual Report (Form 10-K) for the year ended December 31, 2019, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Philadelphia, Pennsylvania

August 4, 2020

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