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PROSPECTUS



9,574,020 SHARES OF COMMON STOCK

This prospectus relates to the resale, from time to time, of up to 9,574,020 shares of our common stock, all of which are being offered by the selling stockholders named in this prospectus, which shares include 3,804,788 shares of our common stock that are issued and outstanding and up to 5,769,232 shares of our common stock issuable upon the conversion of outstanding senior subordinated convertible notes. The senior subordinated convertibles notes were sold by us to a selling stockholder in connection with a private placement pursuant to Rule 506 of Regulation D promulgated under the Securities Act of 1933, as amended, or the Securities Act. We are registering these shares on behalf of the selling stockholders to be offered and sold by them from time to time.

We are not selling any shares of our common stock under this prospectus and will not receive any proceeds from the sale of the shares of our common stock by the selling stockholders.

The selling stockholders identified in this prospectus, or their pledgees, assignees, donees, transferees or other successors-in-interest, may offer the shares from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices.

Our common stock is traded on the Nasdaq Global Market, or Nasdaq, under the symbol "OCUL." On April 29, 2019, the closing sale price of our common stock on Nasdaq was \$3.93 per share. You are urged to obtain current market quotations for our common stock.

Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page 3.

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

The date of this prospectus is April 29, 2019.

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ABOUT THIS PROSPECTUS

You should carefully read this prospectus and the information set forth under the heading "Where You Can Find More Information" on page 16. Neither we nor the selling stockholders have authorized anyone to provide you with information different from that contained or incorporated by reference in this prospectus. If anyone provides you with different or inconsistent information, you should not rely on it. The selling stockholders are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where such offers and sales are permitted. No one is making offers to sell or seeking offers to buy shares of common stock in any jurisdiction where such offers or sales are not permitted. The information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus, regardless of the time of delivery of this prospectus or of any sale of common stock. Our business, financial condition, results of operations and prospects may have changed since such date.

PROSPECTUS SUMMARY

This summary highlights selected information appearing elsewhere in this prospectus and in the documents incorporated herein by reference and does not contain all of the information that you should consider before investing in our common stock. You should read the entire prospectus carefully, especially the risks of investing in our common stock discussed under "Risk Factors" beginning on page 3, the information incorporated herein by reference and the exhibits to the registration statement which this prospectus is a part.

Unless the context otherwise indicates, references in this prospectus to "we," "our" and "us" refer, collectively, to Ocular Therapeutix, Inc., a Delaware corporation, and its consolidated subsidiary.

Ocular Therapeutix, Inc.

We are a biopharmaceutical company focused on the formulation, development and commercialization of innovative therapies for diseases and conditions of the eye using our proprietary, bioresorbable hydrogel platform technology. We use this technology to tailor duration and amount of delivery of a range of therapeutic agents of varying duration in our product candidates.

We currently incorporate therapeutic agents that have previously received regulatory approval, including small molecules and proteins, into our hydrogel technology with the goal of providing local programmed-released delivery of drug to the eye. We believe that our local programmed-release technology has the potential to treat conditions and diseases of both the front and the back of the eye and can be administered through a range of different modalities including intracanalicular inserts, intracameral implants and intravitreal implants. We have products and product candidates in clinical and preclinical development applying this technology to treat post-surgical ocular pain and inflammation, allergic conjunctivitis, dry eye disease, glaucoma and ocular hypertension, and wet age-related macular degeneration, or wet AMD, among other conditions.

In addition to our focus on formulating, developing and commercializing innovative therapies for diseases and conditions of the eye, we are also assessing the potential use of our hydrogel platform technology in other areas of the body.

Corporate Information

Our principal executive offices and research and development operations are located at 15 Crosby Drive, Bedford, MA 01730, and our telephone number is (781) 357-4000. Our manufacturing operations are located at 36 Crosby Drive, Bedford, MA 01730.

THE OFFERING

Common Stock offered by selling stockholders	9,574,020 shares
Terms of the offering	The selling stockholders identified in this prospectus, or their pledgees, assignees, donees, transferees or other successors-in-interest, may offer the shares from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. You should read the "Plan of Distribution" section beginning on page 14 for additional information on how the selling stockholders may conduct sales of our common stock.
Use of proceeds	We will not receive any proceeds from the sale of shares of common stock offered hereby.
Risk Factors	You should read the "Risk Factors" section beginning on page 3 of this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
Nasdaq Global Market symbol	"OCUL"

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described in our filings with the Securities and Exchange Commission, or the SEC, including our most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q, which are incorporated by reference herein in their entirety, together with other information in this prospectus, as well as any applicable prospectus supplement, and the information and documents incorporated by reference in this prospectus before making an investment decision pursuant to this prospectus. Our business, financial condition and results of operations could be materially and adversely affected by any or all of these risks or by additional risks and uncertainties not presently known to us or that we currently deem immaterial that may adversely affect us in the future. In any such 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.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus and the information incorporated by reference herein include "forward-looking statements" within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that involve substantial risks and uncertainties. All statements, other than statements of historical facts, contained in this prospectus and the information incorporated by reference herein, including statements regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management, are forward-looking statements. The words "anticipate," "believe," "estimate," "expect," "intend," "may," "might," "plan," "predict," "project," "target," "potential," "goals," "will," "would," "could," "should," "continue" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included or incorporated in this prospectus, particularly under the heading "Risk Factors," that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures, collaborations or investments we may make. You should read this prospectus and the documents incorporated by reference in this prospectus completely and with the understanding that our actual future results may be materially different from what we expect. We do not assume any obligation to revise or update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law.

STATEMENT REGARDING INDUSTRY AND MARKET DATA & TRADEMARKS

We obtained the market, industry and competitive position data contained in or incorporated by reference into this prospectus from our own internal data and estimates and a variety of third-party sources, including independent industry publications, government publications, reports by market research firms or other published independent sources. Our internal data and estimates are based upon information obtained from trade and business organizations and other contacts in the markets in which we operate and our management's understanding of industry conditions.

This prospectus and the documents incorporated by reference herein contain references to our trademarks and service marks and to those belonging to other entities. Solely for convenience, trademarks and trade names referred to in this prospectus and the documents incorporated by reference herein may appear without the ® or ™ symbols, but such references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other companies' trade names, trademarks or service marks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

USE OF PROCEEDS

We will not receive any proceeds from the sale of the shares of our common stock covered by this prospectus. All proceeds from the sale of the shares will be for the account of the selling stockholders named herein.

The selling stockholders will pay any underwriting discounts and commissions and expenses incurred by the selling stockholders for brokerage, accounting, tax or legal services or any other expenses incurred by the selling stockholders in disposing of the shares covered by this prospectus. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares covered by this prospectus, including, without limitation, all registration and filing fees, Nasdaq listing fees, and fees and expenses of our counsel and our accountants.

SELLING STOCKHOLDERS

The shares of common stock covered by this prospectus consist of 5,769,232 shares of common stock issuable upon the conversion of a senior subordinated convertible note, dated March 1, 2019, between us and Cap 1 LLC, or Cap 1, an affiliate of Summer Road, LLC, or Summer Road, in accordance with the terms therein, and 3,804,788 additional outstanding shares of common stock held by Cap 1 and another affiliate of Summer Road, or the selling stockholders, as of March 1, 2019, all of which we have agreed to use commercially reasonable effort to register in accordance with a registration rights agreement. For additional information regarding the senior subordinated convertible note and the related registration rights agreement, see "*Description of Transactions with the Selling Stockholders*" below. We are registering the shares of common stock to permit the selling stockholders to offer the shares for resale from time to time.

To our knowledge and except as noted under the caption titled "*Description of Transactions with the Selling Stockholders*" below, the selling stockholders do not have, and within the past three years have not had, any position, office or other material relationship with us or any of our predecessors or affiliates.

The following table sets forth, to our knowledge, certain information about the selling stockholders as of March 15, 2019. The information in the table below with respect to the selling stockholders has been obtained from the selling stockholders. The percentage of beneficial ownership is based upon 42,836,572 shares of common stock outstanding on March 15, 2019.

Beneficial ownership is determined in accordance with the rules of the SEC and includes voting or investment power with respect to shares. Shares of common stock that the holder has the right to acquire upon the exercise or conversion of derivative securities within 60 days after March 15, 2019 are deemed outstanding for computing the percentage of ownership of the person holding such derivative securities but are not deemed outstanding for computing the percentage ownership of any other persons. Unless otherwise indicated below, to our knowledge, all persons named in the table have sole voting and investment power with respect to their shares of common stock, except to the extent authority is shared by spouses under applicable law. The inclusion of any shares in this table does not constitute an admission of beneficial ownership for the person named below.

Name of Selling Stockholders	Shares of Common Stock Beneficially Owned Prior to Offering		Number of Shares of Common Stock Being Offered	Shares of Common Stock to be Beneficially Owned After Offering(1)	
	Number	Percentage		Number	Percentage
Cap 1 LLC(2)	8,946,532(3)	18.4%	8,946,532	0	—
East River Partners Ltd.(2)	627,488	1.5%	627,488	0	—

- (1) We do not know when or in what amounts the selling stockholders may offer shares for sale. The selling stockholders might not sell any of the shares offered by this prospectus. Because the selling stockholders may offer all or some of the shares pursuant to this offering, and because there are currently no agreements, arrangements or understandings with respect to the sale of any of the shares covered by this prospectus, we cannot estimate the number of the shares that will be held by the selling stockholders after completion of the offering. However, for purposes of this table, we have assumed that, after completion of the offering, none of the shares covered by this prospectus will be held by the selling stockholders.
- (2) Summer Road is a family office of the same family under Investment Advisers Act of 1940 Rule 202(a)(11)(G)-1, or the Family Office Rule. Pursuant to investment management agreements between itself and its "Family Clients" (as defined in the Family Office Rule), Summer Road exercises voting and dispositive power with respect to our common stock held by each of the

Family Clients. Summer Road's mailing address is 655 Madison Avenue, 19th Floor, New York, New York 10065 Attn: Richard A. Silerberg, Chief Operating Officer.

- (3) Includes 5,769,232 shares of our common stock subject to issuance pursuant to the senior subordinated convertible note.

Description of Transactions with the Selling Stockholders

Private Placement of Convertible Debt

On February 21, 2019, or the Agreement Date, we entered into a Note Purchase Agreement, or the Purchase Agreement, with Cap 1 to issue and sell to Cap 1 unsecured senior subordinated convertible notes, or the Notes, in the original aggregate principal amount of \$37.5 million. The issuance and sale of the Notes occurred on March 1, 2019, or the Closing Date. The Notes were issued in reliance on the exemption from registration set forth in Rule 506 of Regulation D promulgated under the Securities Act. In accordance with the Purchase Agreement, each Note accrues interest at a rate of 6% of its outstanding principal amount per annum, payable at maturity. The maturity date of each Note is March 1, 2026, unless earlier converted, repurchased or redeemed as described below.

Holders of the Notes may, subject to certain conditions, convert all or part of the outstanding principal amount of their Notes into shares of our common stock, provided that no conversion results in the holder or its affiliates beneficially owning more than 19.99% of our issued and outstanding common stock. The conversion rate for the Notes is initially 153.8462 shares of our common stock per \$1,000 principal amount of the Notes, which is equivalent to an initial conversion price of approximately \$6.50 per share. The conversion rate is subject to adjustment in customary circumstances such as stock splits or similar changes to our capitalization. At our election, we may choose to make such conversion payment in cash, in shares of our common stock, or in a combination thereof. Upon any conversion of any Note, we are obligated to make a cash payment to the holder of such Note for any interest accrued but unpaid on the principal amount converted. Upon the occurrence of a "Corporate Transaction" (as defined in the Notes), the holder of a Note is entitled, at such holder's option, to convert all of the outstanding principal amount of the Note in accordance with the foregoing and receive an additional "make-whole" cash payment in accordance with a table set forth in each Note.

Upon the occurrence of a Corporate Transaction, each holder of a Note has the option to require us to repurchase all or part of the outstanding principal amount of such Note at a repurchase price equal to 100% of the outstanding principal amount of the Note to be repurchased, plus accrued and unpaid interest to, but excluding, the repurchase date.

On or after March 1, 2022, if the last reported sale price of our common stock has been at least 130% of the conversion rate then in effect for twenty of the preceding thirty trading days (including the last trading day of such period), we are entitled, at our option, to redeem all or part of the outstanding principal amount of the Notes, on a pro rata basis, at an optional redemption price equal to 100% of the outstanding principal amount of the Notes to be redeemed, plus accrued and unpaid interest to, but excluding, the optional redemption date.

The Purchase Agreement contains customary representations and warranties by us and Cap 1. The Purchase Agreement does not include any financial covenants. Our obligations under the Purchase Agreement and the Notes are subject to acceleration upon the occurrence of specified events of default, including in the case of a default or breach of certain contracts material to us, and the delisting and deregistration of our common stock.

Registration Rights Agreement

In connection with the execution of the Purchase Agreement and the issuance and sale of the Notes thereunder, we and Cap 1 entered into a registration rights agreement, or the Registration Rights Agreement, on the Closing Date. Under the terms of the Registration Rights Agreement and subject to specified exceptions, we are obligated to use commercially reasonable efforts, at our expense, to file with the SEC a resale registration statement to which this prospectus relates, or the Registration Statement, to register our common stock underlying the Notes and certain other registrable securities within 30 days of the Closing Date and to have the SEC declare the Registration Statement effective within 90 days of the Closing Date. We will be further obligated to use commercially reasonable efforts to cause the Registration Statement to remain continuously effective until the earlier of the dates when all securities registrable under the Registration Rights Agreement (i) have been sold or (ii) may be sold without restriction, subject to certain conditions, pursuant to Rule 144 promulgated under the Securities Act.

DESCRIPTION OF CAPITAL STOCK

The following description of our capital stock and provisions of our certificate of incorporation and by-laws are summaries and are qualified by reference to our certificate of incorporation, our by-laws and applicable provisions of Delaware corporate law. We have filed copies of our certificate of incorporation and our by-laws with the SEC as exhibits to the Registration Statement.

Our authorized capital stock consists of 100,000,000 shares of our common stock, par value \$0.0001 per share, and 5,000,000 shares of our preferred stock, par value \$0.0001 per share, all of which preferred stock is undesignated.

As of March 15, 2019, we had issued and outstanding 42,836,572 shares of our common stock and no shares of our preferred stock.

Common Stock

Voting Rights. Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. Each election of directors by our stockholders will be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. In general, except (1) for the election of directors, (2) as described below under "—Provisions of Our Certificate of Incorporation and By-laws and Delaware Law That May Have Anti-Takeover Effects—Super-Majority Voting," (3) in the future to the extent that we have two or more classes or series of stock outstanding with separate voting rights and (4) as otherwise required by law, any matter to be voted on by our stockholders at any meeting is decided by the vote of the holders of a majority in voting power of the votes cast by the holders of shares of our stock present or represented at the meeting and voting affirmatively or negatively on such matter.

Dividends. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of outstanding preferred stock.

Liquidation and Dissolution. In the event of our liquidation or dissolution, the holders of our common stock are entitled to receive proportionately all assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any of our outstanding preferred stock.

Other Rights. Holders of our common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of our common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of our preferred stock that we may designate and issue in the future.

Transfer Agent and Registrar. Computershare Trust Company, Inc. is transfer agent and registrar for our common stock.

Nasdaq Global Market. Our common stock is listed on Nasdaq under the symbol "OCUL."

Preferred Stock

Under the terms of our certificate of incorporation, our board of directors is authorized to issue shares of our preferred stock in one or more series without stockholder approval, subject to any limitations imposed by applicable Nasdaq rules. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The

issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a majority of our outstanding voting stock. Currently, we have no shares of preferred stock outstanding.

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 Nasdaq. 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.

Provisions of Our Certificate of Incorporation and By-laws and Delaware Law That May Have Anti-Takeover Effects

Delaware Law

We are subject to Section 203 of the Delaware General Corporation Law, or the DGCL. 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 it became an interested stockholder. A "business combination" includes, among other things, (i) a merger or consolidation involving us and the "interested stockholder" and (ii) 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. The restrictions contained in Section 203 are not applicable to any of our existing stockholders that owned 15% or more of our outstanding voting stock upon the closing of our initial public offering.

Staggered Board; Removal of Directors

Our certificate of incorporation and our by-laws divide our board of directors into three classes with staggered three-year terms. In addition, our certificate of incorporation and our by-laws provide that directors may be removed only for cause and only by the affirmative vote of the holders of 75% of our shares of capital stock present in person or by proxy and entitled to vote. Under our certificate of incorporation and by-laws, any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office. Furthermore, our certificate of incorporation provides that the authorized number of directors may be changed only by the resolution of our board of directors. The classification of our board of directors and the limitations on the ability of our stockholders to remove directors, change the authorized number of directors and fill vacancies could make it more difficult for a third party to acquire, or discourage a third party from seeking to acquire, control of our company.

Stockholder Action; Special Meeting of Stockholders; Advance Notice Requirements for Stockholder Proposals and Director Nominations

Our certificate of incorporation and our by-laws provide that any action required or permitted to be taken by our stockholders at an annual meeting or special meeting of stockholders may only be taken if it is properly brought before such meeting and may not be taken by written action in lieu of a meeting. Our certificate of incorporation and our by-laws also provide that, except as otherwise required by law, special meetings of the stockholders can only be called by the chairman of our board of directors, our chief executive officer or our board of directors. In addition, our by-laws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of stockholders, including proposed nominations of candidates for election to our board of directors. Stockholders at an annual meeting may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of our board of directors, or by a stockholder of record on the record date for the meeting who is entitled to vote at the meeting and who has delivered timely written notice in proper form to our secretary of the stockholder's intention to bring such business before the meeting. These provisions could have the effect of delaying until the next stockholder meeting stockholder actions that are favored by the holders of a majority of our outstanding voting securities. These provisions also could discourage a third party from making a tender offer for our common stock because even if the third party acquired a majority of our outstanding voting stock, it would be able to take action as a stockholder, such as electing new directors or approving a merger, only at a duly called stockholders meeting and not by written consent.

Super-Majority Voting

The DGCL 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 by-laws unless a corporation's certificate of incorporation or by-laws, as the case may be, requires a greater percentage. Our by-laws may be amended or repealed by a majority vote of our board of directors or the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in any annual election of directors. In addition, the affirmative vote of the holders of at least 75% of the votes that all our stockholders would be entitled to cast in any election of directors is required to amend or repeal or to adopt any provisions inconsistent with any of the provisions of our certificate of incorporation described above.

Registration Rights

We entered into a fourth amended and restated investors' rights agreement dated June 30, 2013, as amended, or the investor rights agreement, with holders of our then-outstanding preferred stock prior to the closing of our initial public offering. Such preferred stock was converted into common stock upon consummation of our initial public offering. Holders of a total of 2,656,538 shares of our common stock outstanding or issuable upon exercise of warrants outstanding as of March 15, 2019 have the right to require us to register these shares under the Securities Act under specified circumstances. After registration pursuant to these rights, these shares will become freely tradable without restriction under the Securities Act. If not otherwise exercised, the rights under the investor rights agreement described below will expire five years after the closing of our initial public offering, which occurred on July 30, 2014.

Demand and Form S-3 Registration Rights

Subject to specified limitations set forth in the investor rights agreement, at any time, the holders of at least 50% of the then outstanding shares having rights under the investor rights agreement, or the registrable securities, may demand that we register registrable securities then outstanding under the Securities Act for purposes of a public offering having an aggregate offering price to the public of not

less than \$10 million. We are not obligated to file a registration statement pursuant to this provision on more than two occasions.

In addition, subject to specified limitations set forth in the investor rights agreement, at any time after we become eligible to file a registration statement on Form S-3, holders of the registrable securities then outstanding may request that we register their registrable securities on Form S-3 for purposes of conducting a public offering for which the reasonably anticipated aggregate offering price to the public would exceed \$1 million.

Incidental Registration Rights

If we propose to register for our own account any of our securities under the Securities Act, the holders of registrable securities will be entitled to notice of the registration and, subject to specified exceptions, have the right to require us to use our best efforts to register all or a portion of the registrable securities then held by them in that registration. Under our outstanding warrants, each of the holders of the warrants is also entitled to notice of the registration at the time that we provide notice of the registration to the holders of registrable securities. The holders of registrable securities waived these incidental registration rights in connection with this offering.

In the event that any registration in which the holders of registrable securities participate pursuant to our investor rights agreement is an underwritten public offering or if any warrant holder participates in such an offering pursuant to the warrants, we have agreed to enter into an underwriting agreement containing customary representations and warranties and covenants, including without limitation customary provisions with respect to indemnification of the underwriters of such offering.

In the event that any registration in which the holders of registrable securities participate pursuant to our investor rights agreement is an underwritten offering or if any warrant holder participates pursuant to the warrants, we will use our best efforts to include the requested securities to be included, but such inclusions may be limited by market conditions to the extent set forth in the investor rights agreement.

Expenses

Pursuant to the investor rights agreement, we are required to pay all registration expenses, including all registration and filing fees, exchange listing fees, printing expenses, fees and expenses of one counsel selected by the selling stockholders named therein to represent such selling stockholders, state Blue Sky fees and expenses, and the expense of any special audits incident to or required by any such registration, but excluding underwriting discounts, selling commissions and the fees and expenses of the selling stockholders' own counsel (other than the counsel selected to represent all selling stockholders). We are not required to pay registration expenses if the registration request under the investor rights agreement is withdrawn at the request of holders initiating such registration request, unless the withdrawal is related to information concerning the business or financial condition of us after the initiation of such registration request.

The investor rights agreement contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling stockholders named therein in the event of material misstatements or omissions in the registration statement attributable to us or any violation or alleged violation whether by action or inaction by us under the Securities Act, the Exchange Act, any state securities or Blue Sky law or any rule or regulation promulgated under the Securities Act, the Exchange Act or any state securities or Blue Sky law in connection with such registration statement or the qualification or compliance of the offering, and they are obligated to indemnify us for material misstatements or omissions in the registration statement attributable to them.

Registration Rights Regarding Shares Issuable Upon Conversion of Convertible Notes

As described above under the heading "Selling Stockholders—Description of Transactions with the Selling Stockholders—*Registration Rights Agreement*," we also entered into the Registration Rights Agreement in connection with the issuance and sale of the Notes on the Closing Date.

PLAN OF DISTRIBUTION

The selling stockholders, which as used herein includes donees, pledgees, transferees or other successors-in-interest selling shares of common stock or interests in shares of common stock received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer or otherwise dispose of any or all of its shares of common stock or interests in shares of common stock on any stock exchange, market or trading facility on which the shares are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The selling stockholders may use any one or more of the following methods when disposing of shares or interests therein:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- short sales effected after the date the registration statement of which this prospectus is a part is declared effective by the SEC;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- broker-dealers may agree with a selling stockholder to sell a specified number of such shares at a stipulated price per share;
- a combination of any such methods of sale; and
- any other method permitted by applicable law.

To the extent required, this prospectus may be amended or supplemented from time to time to describe a specific plan of distribution.

A selling stockholder may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by it and, if it defaults in the performance of its secured obligations, the pledgees or secured parties may offer and sell the shares of common stock, from time to time, under this prospectus, or under an amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act, amending the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholder under this prospectus. A selling stockholder also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of common stock or interests therein, a selling stockholder may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of our common stock in the course of hedging the positions it assumes. A selling stockholder may also sell shares of common stock short and deliver these securities to close out its short positions, or loan or pledge our common stock to broker-dealers that in turn may sell these securities. A selling stockholder may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the

delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The aggregate proceeds to a selling stockholder from the sale of our common stock offered by it will be the purchase price of the common stock less discounts or commissions, if any. The selling stockholders reserve the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of our common stock to be made directly or through agents. We will not receive any of the proceeds from this offering.

A selling stockholder also may resell all or a portion of the shares in open market transactions in reliance upon Rule 144 under the Securities Act, provided that they meet the criteria and conform to the requirements of that rule.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of our common stock or interests therein may be "underwriters" within the meaning of Section 2(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of the shares may be underwriting discounts and commissions under the Securities Act. A selling stockholder who is an "underwriter" within the meaning of Section 2(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act.

To the extent required, the shares of our common stock to be sold, the name of the selling stockholders, the respective purchase prices and public offering prices, the names of any agents, dealer or underwriter, and any applicable commissions or discounts with respect to a particular offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the Registration Statement.

In order to comply with the securities laws of some states, if applicable, our common stock may be sold in those jurisdictions only through registered or licensed brokers or dealers. In addition, in some states such common stock may not be sold unless it has been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

We have advised the selling stockholders that the anti-manipulation rules of Regulation M promulgated under the Exchange Act may apply to sales of shares in the market and to the activities of the selling stockholders and their affiliates. In addition, to the extent applicable we will make copies of this prospectus (as it may be supplemented or amended from time to time) available to the selling stockholders for the purpose of satisfying the prospectus delivery requirements of the Securities Act. The selling stockholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

We have agreed to indemnify the selling stockholders against liabilities, including liabilities under the Securities Act and state securities laws, relating to the registration of the shares offered by this prospectus.

We have agreed with the selling stockholders to keep the Registration Statement effective until the earlier of (1) such time as all of the shares covered by this prospectus and actually issued or issuable upon conversion of the Notes have been sold and (2) the date on which all of the shares may be sold without restriction pursuant to Rule 144 of the Securities Act.

LEGAL MATTERS

The validity of the shares of our common stock being offered by this prospectus has been passed upon for us by Wilmer Cutler Pickering Hale and Dorr LLP.

EXPERTS

The financial statements incorporated in this Prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2018 have been so incorporated in reliance on the report (which contains an explanatory paragraph relating to the Company's ability to continue as a going concern as described in Note 1 to the financial statements) of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

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.ocutx.com>. Our website is not a part of this prospectus and is not incorporated by reference in this prospectus.

This prospectus constitutes a part of a registration statement on Form S-3 that we have filed with the SEC under the Securities Act. The registration statement contains more information than this prospectus regarding us and our common stock, including certain exhibits and schedules. You can obtain a copy of the registration statement from the SEC's Internet site or our website.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC requires us to "incorporate" into this prospectus information that we file with the SEC in other documents. This means that we can disclose important information to you by referring to other documents that contain that information. The information incorporated by reference is considered to be part of this prospectus. Information contained in this prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus automatically updates and supersedes previously filed information. We incorporate 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 Exchange Act after the date of this prospectus and prior to the sale of all the shares covered by this prospectus.

- (1) Our Annual Report on Form 10-K for the year ended December 31, 2018, including the information specifically incorporated by reference into our Annual Report on Form 10-K from our definitive proxy statement for the 2019 Annual Meeting of Stockholders;
- (2) Our Current Reports on Form 8-K dated February 20, 2019; February 22, 2019; March 25, 2019; April 5, 2019; and April 23, 2019; and
- (3) The description of our common stock contained in our Registration Statement on Form 8-A filed on July 21, 2014, including any amendments or reports filed for the purpose of updating such description.

A statement contained in a document incorporated by reference into this prospectus shall be deemed to be modified or superceded for purposes of this prospectus to the extent that a statement contained in this prospectus or in any other subsequently filed document which is also incorporated in this prospectus modifies or replaces such statement. Any statements so modified or superceded shall not be deemed, except as so modified or superceded, to constitute a part of this prospectus.

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:

Ocular Therapeutix, Inc.
Attn: Chief Financial Officer
15 Crosby Drive
Bedford, MA 01730
(781) 357-4000

PROSPECTUS



9,574,020 SHARES OF COMMON STOCK

April 29, 2019
