

PROSPECTUS



Up to 5,340,591 Shares of Common Stock

**Up to 2,012,356 Shares of Common Stock Issuable Upon Exercise
of Pre-Funded Warrants**

**Up to 7,352,947 Shares of Common Stock Issuable Upon Exercise
of Series A Common Stock Warrants**

**Up to 7,352,947 Shares of Common Stock Issuable Upon Exercise
of Series B Common Stock Warrants**

**Up to 183,824 Shares of Common Stock Issuable Upon Exercise
of Placement Agent Series A Common Stock Warrants**

**Up to 183,823 Shares of Common Stock Issuable Upon Exercise
of Placement Agent Series B Common Stock Warrants**

This prospectus relates to the proposed resale from time to time by the selling stockholders of:

- up to 5,340,591 shares of common stock;
- up to 2,012,356 shares of common stock issuable upon exercise of pre-funded warrants;
- up to 7,352,947 shares of common stock issuable upon exercise of Series A common stock warrants;
- up to 7,352,947 shares of common stock issuable upon exercise of Series B common stock warrants;
- up to 183,824 shares of common stock issuable upon exercise of placement agent Series A common stock warrants; and
- up to 183,823 shares of common stock issuable upon exercise of placement agent Series B common stock warrants.

The selling stockholders purchased the shares of common stock, pre-funded warrants, Series A common stock warrants and Series B common stock warrants from us pursuant to a securities purchase agreement, dated July 17, 2023. In addition, we issued placement agent Series A common stock warrants and placement agent Series B common stock warrants to the designees of the placement agent pursuant to an engagement letter, dated May 23, 2023, as amended on July 17, 2023.

We are not selling any of our common stock pursuant to this prospectus, and we will not receive any proceeds from the sale of our common stock offered by this prospectus by the selling stockholders.

The selling stockholders may offer and sell or otherwise dispose of the shares of our common stock described in this prospectus 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. The selling stockholders will bear all underwriting fees, commissions and discounts, if any, attributable to the sales of shares and any transfer taxes. We will bear all other costs, expenses and fees in connection with the registration of the shares. See “Plan of Distribution” for more information about how the selling stockholders may sell or dispose of their shares of our common stock.

Our common stock is listed on The Nasdaq Global Market under the trading symbol “ACRX.” On August 8, 2023, the last reported sale price of the common stock was \$0.95 per share.

Investing in our common stock involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading “Risk Factors” on page 3 of this prospectus, and under similar headings in the other documents that are incorporated by reference into this prospectus.

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

The date of this prospectus is August 9, 2023.

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ABOUT THIS PROSPECTUS

Neither we nor the selling stockholders have authorized anyone to provide you with any information other than that contained in, or incorporated by reference into, this prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares of our common stock offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. You should not assume that the information contained in or incorporated by reference in this prospectus is accurate as of any date other than their respective dates. Our business, financial condition, results of operations and prospects may have changed since those dates.

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

Unless the context indicates otherwise, as used in this prospectus, the terms “AcelRx,” “AcelRx Pharmaceuticals, Inc.,” “we,” “us” and “our” refer to AcelRx Pharmaceuticals, Inc., a Delaware corporation, and its subsidiaries.

PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus or incorporated by reference in this prospectus, and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, including the risks of investing in our securities discussed under the heading “Risk Factors” contained in this prospectus and under similar headings in the other documents that are incorporated by reference into this prospectus. You should also carefully read the information incorporated by reference into this prospectus, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part.

AcelRx Pharmaceuticals, Inc.

Overview

We are a specialty pharmaceutical company focused on the development and commercialization of innovative therapies for use in medically supervised settings. Our lead product candidate, Niyad™, is a lyophilized formulation of nafamostat and is currently being studied under an investigational device exemption as an anticoagulant for the extracorporeal circuit, and has received breakthrough device designation status from the U.S. Food and Drug Administration. We are also developing two pre-filled syringes in-licensed from our partner Laboratoire Aguetant: Fedsyra™, a pre-filled ephedrine syringe, with an expected new drug application filing in 2023, and PFS-02, a pre-filled phenylephrine syringe with an expected new drug application filing in 2024.

Our strategy is focused on developing, obtaining approval and commercializing our product candidates, Niyad and the pre-filled syringes. Accordingly, we divested DSUVIA to Alora Pharmaceuticals, LLC in April 2023, who will continue to commercialize the product and pay us sales-based milestone and other payments. We believe this will maximize the value of DSUVIA as Alora has more available resources to invest on DSUVIA commercialization and as a result can execute a more robust commercial plan to support DSUVIA sales expansion, while we further reduce our operating costs. We have no plans on further developing or commercializing any of our other sufentanil sublingual product candidates. We are focused on achieving an Emergency Use Authorization for Niyad in 2023, and if successful, we expect to begin commercialization, while also initiating the clinical study for full regulatory approval.

Private Placement of Shares of Common Stock and Warrants

On July 17, 2023, we entered into a securities purchase agreement with the selling stockholders pursuant to which we issued in a private placement transaction, or the Private Placement:

- 5,340,591 shares of common stock, par value \$0.001 per share;
- Pre-funded warrants to purchase up to an aggregate of 2,012,356 shares of common stock at an exercise price of \$0.001 per share;
- Series A common stock warrants to purchase up to an aggregate of 7,352,947 shares of common stock at an exercise price of \$1.11 per share; and
- Series B common stock warrants to purchase up to an aggregate of 7,352,947 shares of common stock at an exercise price of \$1.11 per share.

Each share of common stock and each pre-funded warrant which is exercisable for a share of common stock was accompanied by (i) a Series A common stock warrant to purchase one share of common stock, and (ii) a Series B common stock warrant to purchase one share of common stock.

The Series A and B common stock warrants are exercisable by means of cash and have a term ending on July 20, 2028. Upon the achievement and public announcement of certain milestones, the term of such warrants will be reduced to 45 days following such announcement. If at the time of exercise there is no effective registration statement registering, or no current prospectus available for, the resale of the shares of common stock issuable upon exercise of such warrants the selling stockholders may also exercise the warrants at their election, in whole or in part, at such time by means of a net exercise of the warrant on a cashless basis. The Series A and B common stock warrants provides for proportional adjustment of the number and kind of securities purchasable upon exercise of the warrants and the per share exercise price upon the occurrence of certain events such as stock splits, combinations, reverse stock splits and similar events.

In May 2023, we engaged H.C. Wainwright & Co., LLC to act as placement agent in the Private Placement. We agreed to pay the placement agent a cash fee equal to 5.25% of the aggregate gross proceeds generated from the Private Placement and to reimburse certain expenses of the placement agent in connection with the Private Placement in an amount not to exceed \$100,000. The placement agent will also be entitled to an additional one-time payment of \$200,000 upon the exercise of the Series A and Series B common stock warrants resulting in cumulative aggregate gross proceeds to AcelRx of at least \$9.5 million in cash. In addition, we issued to the placement agent's designees:

- Placement agent Series A common stock warrants to purchase up to an aggregate of 183,824 shares of common stock at an exercise price of \$1.70 per share; and
- Placement agent Series B common stock warrants to purchase up to an aggregate of 183,823 shares of common stock at an exercise price of \$1.70 per share.

Use of Proceeds

We will not receive any of the proceeds from the sale of shares of our common stock by the selling stockholders in this offering. The selling stockholders will receive all of the proceeds from the sale of shares of our common stock hereunder.

The Nasdaq Global Market Listing

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

Company Information

We were originally incorporated as SuRx, Inc. in Delaware on July 13, 2005 and changed our name to AcelRx Pharmaceuticals, Inc. on January 6, 2006. Our principal executive offices are located at 25821 Industrial Boulevard, Suite 400, Hayward, California 94545, and our telephone number is (650) 216-3500. Our website address is www.acelrx.com. The information contained in, or that can be accessed through, our website is not part of, and is not incorporated into, this prospectus and should not be considered part of this prospectus.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before deciding whether to invest in our common stock, you should consider carefully the risks and uncertainties described under the heading “Risk Factors” contained in our most recent Annual Report on Form 10-K, as updated by our subsequent Quarterly Reports on Form 10-Q and other filings we make with the Securities and Exchange Commission, or the SEC, which are incorporated by reference into this prospectus in their entirety, together with other information in this prospectus and the documents incorporated by reference. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occur, our business, financial condition, results of operations or cash flow could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below titled “Special Note Regarding Forward-Looking Statements.”

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents we have filed with the SEC that are incorporated 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. These statements relate to future events or to our future operating or financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements may include, but are not limited to, statements about:

- our ability to obtain additional required financing and to continue as a going concern;
- our ability to manage our operating costs and reduce our cash burn;
- the accuracy of our estimates regarding the sufficiency of our cash resources, future revenues, expenses, and capital requirements;
- our ability to maintain listing of our securities trading on The Nasdaq Global Market;
- the historical performance and high volatility in the market price of our common stock;
- macroeconomic uncertainties, including inflationary pressures, domestic and global supply chain disruptions, labor shortages, significant volatility in global markets, and recession risks;
- our ability to secure a potential Emergency Use Authorization for our lead nafamostat developmental product candidate, Niyad;
- our ability to conduct ourselves, or through a contract research organization, clinical trials in a timely and effective manner to advance the development of our product candidates;
- our ability to successfully file for and obtain regulatory approval for, and then successfully launch and commercialize our developmental product candidates;
- the success of our new corporate partner, Vertical Pharmaceuticals LLC, a wholly owned subsidiary of Alora Pharmaceuticals, LLC, or Alora, in integrating and commercializing the DSUVIA asset in the United States, including their effectiveness in marketing, sales, and distribution of the DSUVIA product, themselves or with potential collaborators;
- the extent of future sales of DSUVIA by Alora to the Department of Defense;
- the size and growth potential of the potential markets for our developmental product candidates in the United States and in other jurisdictions, and our ability to serve those markets;
- our estimates of the existence of and commercial potential for markets for our developmental product candidates, if approved;
- our ability to realize the expected benefits and potential value created by the acquisition of Lowell Therapeutics, Inc., for our stockholders, on a timely basis or at all;
- our ability to develop sales and marketing capabilities in a timely fashion, whether alone through recruiting qualified employees, by engaging a contract sales organization, or with potential future collaborators;
- successfully establishing and maintaining commercial manufacturing and supply chain relationships with domestic and global third-party service providers;

- our ability to manage effectively, and the impact of any costs associated with, potential governmental investigations, inquiries, regulatory actions or lawsuits that may be, or have been, brought against us;
- our ability to obtain adequate government or third-party payer reimbursement for our developmental product candidates, if approved;
- our ability to gain access to formularies and establish and then maintain effective relationships with pharmaceutical benefit managers and/or group purchasing organizations for our developmental product candidates, if approved;
- our ability to attract additional collaborators with development, regulatory and commercialization expertise;
- our ability to identify and secure potential strategic partners to develop, secure regulatory approval for and then commercialize our developmental product candidates;
- our ability to successfully retain our key commercial, scientific, engineering, medical or management personnel and hire new personnel as needed;
- existing and future legislation and other regulatory developments in the United States and foreign countries;
- the performance of our third-party suppliers and manufacturers, including any supply chain impacts or work limitations;
- the success of competing therapies that are or become available; and
- our ability to obtain and maintain intellectual property protection for our approved products and product candidates.

In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “could,” “would,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “projects,” “predicts,” “potential” and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events, are based on assumptions and are subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss in greater detail, and incorporate by reference into this prospectus in its entirety, many of these risks under the headings “Risk Factors” in our Annual Report on Form 10-K, as amended, for the year ended December 31, 2022, as updated by our subsequent filings under the Exchange Act, which are incorporated herein by reference, as may be updated or superseded by the risks and uncertainties described under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement.

These risks are not exhaustive. Other sections of this prospectus may include additional factors that could harm our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time, and it is not possible for our management to predict all risk factors nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ from those contained in, or implied by, any forward-looking statements.

You should not rely upon forward-looking statements as predictions of future events. We cannot assure you that the events and circumstances reflected in the forward-looking statements will be achieved or occur.

Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance or achievements. Except as required by law, we undertake no obligation to update publicly any forward-looking statements for any reason after the date of this prospectus or to conform these statements to actual results or to changes in our expectations.

In addition, statements that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this prospectus, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

You should read this prospectus and the documents that we reference in this prospectus and have filed as exhibits to the registration statement of which this prospectus is a part with the understanding that our actual future results, levels of activity, performance and achievements may be different from what we expect. We qualify all of our forward-looking statements by these cautionary statements.

USE OF PROCEEDS

All the shares of our common stock to be sold pursuant to this prospectus will be sold by the selling stockholders. We will not receive any of the proceeds from such sales.

DESCRIPTION OF CAPITAL STOCK

Summary

Our authorized capital stock consists of 200,000,000 shares of common stock and 10,000,000 shares of preferred stock, \$0.001 par value. As of July 20, 2023, we had 16,340,118 shares of common stock issued and outstanding and no shares of preferred stock issued and outstanding.

A description of the material terms and provisions of our amended and restated certificate of incorporation and amended and restated bylaws affecting the rights of holders of our capital stock is set forth below. The description is intended as a summary, and is qualified in its entirety by reference to our amended and restated certificate of incorporation and our amended and restated bylaws which are incorporated by reference into the registration statement of which this prospectus is a part.

Common Stock

Voting Rights. Each holder of common stock is entitled to one vote for each share on all matters submitted to a vote of the stockholders, including the election of directors. In all matters other than the election of directors, the affirmative vote of the majority of shares present in person, by remote communication, or represented by proxy at a meeting of the stockholders and entitled to vote generally on the subject matter shall be the act of the stockholders. Directors shall be elected by a plurality of the votes of the shares present in person, by remote communication, or represented by proxy at a meeting of the stockholders and entitled to vote generally on the election of directors. Our stockholders do not have cumulative voting rights in the election of directors. Accordingly, the holders of a majority of the voting shares are able to elect all of the directors to be elected at any particular time.

Dividends. Subject to preferences that may be applicable to any then outstanding preferred stock, holders of our common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of funds legally available if our board of directors, in its discretion, determines to issue dividends and then only at the times and in the amounts that our board of directors may determine.

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

Rights. Holders of common stock have no preemptive, conversion, subscription or other rights, and there are no redemption or sinking fund provisions applicable to shares of common stock.

Fully Paid and Nonassessable. All of outstanding shares of common stock are fully paid and nonassessable.

Preferred Stock

Our board of directors may, without further action by our stockholders, fix the rights, preferences, privileges and restrictions of up to an aggregate of 10,000,000 shares of preferred stock in one or more series and authorize their issuance. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, terms of redemption, liquidation preferences, sinking fund terms and the number of shares constituting any series or the designation of such series, any or all of which may be greater than the rights of our common stock. The issuance of our preferred stock could adversely affect the voting power of holders of our common stock, and the likelihood that such holders will receive dividend payments and payments upon liquidation. In addition, the issuance of preferred stock could have the effect of delaying, deferring or preventing a change of control or other corporate action.

Anti-Takeover Effects of Provisions of our Certificate of Incorporation and Bylaws and Delaware Law

Certificate of Incorporation and Bylaws. Our amended and restated certificate of incorporation and amended and restated bylaws include a number of provisions that may deter or impede hostile takeovers or changes of control or management. These provisions include:

Issuance of Undesignated Preferred Stock. Under our certificate of incorporation, our board of directors has the authority, without further action by the stockholders, to issue up to 10,000,000 shares of undesignated preferred stock with rights and preferences, including voting rights, designated from time to time by the board of directors. The existence of authorized but unissued shares of preferred stock enables our board of directors to make it more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise.

Classified Board. Our certificate of incorporation provides for a classified board of directors consisting of three classes of directors, with staggered three-year terms. Only one class of directors will be elected at each annual meeting of our stockholders, with the other classes continuing for the remainder of their respective three-year terms. This provision may have the effect of delaying a change in control of the board.

Board of Directors Vacancies. Our Certificate of Incorporation and Bylaws authorize only our board of directors to fill vacant directorships. In addition, the number of directors constituting our board of directors may be set only by resolution adopted by a majority vote of our entire board of directors. These provisions prevent a stockholder from increasing the size of our board of directors and gaining control of our board of directors by filling the resulting vacancies with its own nominees.

Stockholder Action; Special Meetings of Stockholders. Our certificate of incorporation provides that our stockholders may not take action by written consent and may only take action at annual or special meetings of our stockholders. Stockholders will not be permitted to cumulate their votes for the election of directors. Our bylaws further provide that special meetings of our stockholders may be called only by a majority of our board of directors, the chairman of our board of directors, or our chief executive officer. These provisions may prevent stockholders from corporate actions as stockholders at times when they otherwise would like to do so.

Advance Notice Requirements for Stockholder Proposals and Director Nominations. Our bylaws provide advance notice procedures for stockholders seeking to bring business before our annual meeting of stockholders, or to nominate candidates for election as directors at our annual meeting of stockholders. Our bylaws also specify certain requirements as to the form and content of a stockholder's notice. These provisions may make it more difficult for our stockholders to bring matters before our annual meeting of stockholders or to nominate directors at our annual meeting of stockholders.

These provisions are intended to enhance the likelihood of continued stability in the composition of our board of directors and its policies and to discourage certain types of transactions that may involve an actual or threatened acquisition of us. These provisions are designed to reduce our vulnerability to an unsolicited acquisition proposal. The provisions also are intended to discourage certain tactics that may be used in proxy fights. However, these provisions could have the effect of discouraging others from making tender offers for our shares and, as a consequence, they may also reduce fluctuations in the market price of our shares that could result from actual or rumored takeover attempts.

Section 203 of the Delaware General Corporation Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. This section prevents some Delaware corporations from engaging, under some circumstances, in a business combination, which includes a merger or sale of at least 10% of the corporation's assets with any interested stockholder, meaning a stockholder who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of the corporation's outstanding voting stock, unless:

- the transaction is approved by the board of directors prior to the time that the interested stockholder became an interested stockholder;

- upon consummation of the transaction which resulted in the stockholder's becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced; or
- at or subsequent to such time that the stockholder became an interested stockholder the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders by at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

In general, Section 203 defines "business combination" to include the following:

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

In general, Section 203 defines an "interested stockholder" as an entity or person who, together with the person's affiliates and associates, beneficially owns, or within three years prior to the time of determination of interested stockholder status did own, 15% or more of the outstanding voting stock of the corporation.

A Delaware corporation may "opt out" of these provisions with an express provision in its original certificate of incorporation or an express provision in its certificate of incorporation or bylaws resulting from a stockholders' amendment approved by at least a majority of the outstanding voting shares. We have not "opted out" of these provisions and do not plan to do so. The statute could prohibit or delay mergers or other takeover or change in control attempts and, accordingly, may discourage attempts to acquire us.

Listing on The Nasdaq Global Market

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

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare, Inc.: 1-800-736-3001. The transfer agent's address is 250 Royall Street, Canton, Massachusetts 02021.

SELLING STOCKHOLDERS

The selling stockholders may offer and sell, from time to time, any or all of the shares of common stock being offered for resale by this prospectus, which consists of:

- up to 5,340,591 shares of common stock;
- up to 2,012,356 shares of common stock issuable upon exercise of the pre-funded warrants;
- up to 7,352,947 shares of common stock issuable upon exercise of the Series A common stock warrants;
- up to 7,352,947 shares of common stock issuable upon exercise of the Series B common stock warrants;
- up to 183,824 shares of common stock issuable upon exercise of the placement agent Series A common stock warrants; and
- up to 184,823 shares of common stock issuable upon exercise of the placement agent Series B common stock warrants.

For additional information regarding the issuance of these securities, see the section titled “Private Placement of Shares of Common Stock and Warrants.” Except for the ownership of the shares of common stock and warrants, the selling stockholders have not had any material relationship with us within the past three years.

As used in this prospectus, the term “selling stockholders” includes the selling stockholders listed in the table below, together with any additional selling stockholders listed in a subsequent amendment to this prospectus, and their donees, pledgees, assignees, transferees, distributees and successors-in-interest that receive shares in any non-sale transfer after the date of this prospectus.

In accordance with the terms of a registration rights agreement with the selling stockholders, this prospectus covers the resale of the number of shares of common stock issued to the selling stockholders and the maximum number of shares of common stock issuable upon exercise of the pre-funded warrants and common stock warrants without regard to any limitations on the exercise of such warrants. Under the terms of the pre-funded warrants and common stock warrants held by selling stockholders, a selling stockholder may not exercise any such warrants to the extent such exercise would cause such selling stockholder, together with its affiliates and attribution parties, to beneficially own a number of shares of common stock which would exceed 4.99% or 9.99%, as applicable, of our then outstanding shares common stock following such exercise, excluding for purposes of such determination shares of common stock issuable upon exercise of such warrants which have not been exercised.

The table below lists the selling stockholders and other information regarding the beneficial ownership of the shares of common stock by each of the selling stockholders as of July 20, 2023, assuming the full exercise of the warrants held by the selling stockholders on that date, without regard to any limitations on exercises. The following table also provides the number of shares of common stock that may be sold by each selling stockholder under this prospectus and that each selling stockholder will beneficially own assuming all the shares of common stock that may be offered pursuant to this prospectus are sold. Because each selling stockholder may dispose of all, none or some portion of their shares of common stock, no estimate can be given as to the number of shares of common stock that will be beneficially owned by a selling stockholder upon termination of this offering. For purposes of the table below; however, we have assumed that after termination of this offering none of the shares of common stock covered by this prospectus will be beneficially owned by the selling stockholders and further assumed that the selling stockholders will not acquire beneficial ownership of any additional securities during the offering. In addition, the selling stockholders may have sold, transferred or otherwise disposed of, or may sell, transfer or otherwise dispose of, at any time and from time to time, our securities in transactions exempt from the registration requirements of the Securities Act after the date on which the information in the table is presented. See the section titled “Plan of Distribution.”

Name of Selling Stockholder	Beneficial Ownership Prior to This Offering		Number of Shares Being Offered	Beneficial Ownership After This Offering	
	Shares	%		Shares	%
Armistice Capital, LLC ⁽¹⁾	11,594,701	44.0%	6,617,649	4,977,052	23.4%
Investor Company ITF Rosalind Master Fund L.P. ⁽²⁾	4,411,770	22.1	4,411,770	-	-
Blackwell Partners LLC – Series A ⁽³⁾	4,170,738	21.2	4,170,738	-	-
District 2 Capital Fund LP ⁽⁴⁾	1,654,413	9.5	1,654,413	-	-
NCP RFM LP ⁽⁵⁾	1,319,895	7.6	1,319,895	-	-
Intracoastal Capital LLC ⁽⁶⁾	1,102,944	6.5	1,102,944	-	-
Lind Global Fund II LP ⁽⁷⁾	1,102,944	6.5	1,102,944	-	-
Nantahala Capital Partners Limited Partnership ⁽⁸⁾	767,226	4.6	767,226	-	-
Bigger Capital Fund, LP ⁽⁹⁾	551,472	3.3	551,472	-	-
Nantahala Capital Partners II Limited Partnership ⁽¹⁰⁾	359,790	2.2	359,790	-	-
Michael Vasinkevich ⁽¹¹⁾	235,754	1.4	235,754	-	-
Aileen Gibbons ⁽¹²⁾	69,853	*	69,853	-	-
Noam Rubinstein ⁽¹³⁾	45,956	*	45,956	-	-
Craig Schwabe ⁽¹⁴⁾	12,408	*	12,408	-	-
Charles Worthman ⁽¹⁵⁾	3,676	*	3,676	-	-

* Less than one percent.

- (1) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 1,610,000 shares of common stock, (ii) 595,883 shares of common stock issuable upon the exercise of pre-funded warrants, (iii) 2,205,883 shares of common stock issuable upon the exercise of Series A common stock warrants, and (iv) 2,205,883 shares of common stock issuable upon the exercise of Series B common stock warrants. In addition to the foregoing shares, as of July 20, 2023, Armistice Capital Master Fund Ltd. held common stock warrants to purchase 4,977,052 shares of common stock. The securities are directly held by Armistice Capital Master Fund Ltd., a Cayman Islands exempted company (the “Master Fund”), and may be deemed to be beneficially owned by: (i) Armistice Capital, LLC (“Armistice Capital”), as the investment manager of the Master Fund; and (ii) Steven Boyd, as the Managing Member of Armistice Capital. The pre-funded warrants are subject to a beneficial ownership limitation of 9.99% and the warrants are subject to a beneficial ownership limitation of 4.99%, which such limitations restrict the selling stockholder from exercising that portion of the pre-funded warrants or warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Armistice Capital Master Fund Ltd. is c/o Armistice Capital, LLC, 510 Madison Avenue, 7th Floor, New York, NY 10022.
- (2) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 805,000 shares of common stock, (ii) 665,590 shares of common stock issuable upon the exercise of pre-funded warrants, (iii) 1,470,590 shares of common stock issuable upon the exercise of Series A common stock warrants and (iv) 1,470,590 shares of common stock issuable upon the exercise of Series B common stock warrants. The pre-funded warrants and warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the pre-funded warrants or warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Investor Company ITF Rosalind Master Fund L.P. is C/O TDWaterhouse, 77 Bloor St W 3rd Floor, Toronto, Ontario M5S 1M2.

- (3) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 819,868 shares of common stock, (ii) 570,378 shares of common stock issuable upon the exercise of pre-funded warrants, (iii) 1,390,246 shares of common stock issuable upon the exercise of Series A common stock warrants and (iv) 1,390,246 shares of common stock issuable upon the exercise of Series B common stock warrants. Nantahala Capital Management, LLC is a Registered Investment Adviser and has been delegated the legal power to vote and/or direct the disposition of such securities on behalf of the selling stockholder as a General Partner, Investment Manager, or Sub-Advisor and would be considered the beneficial owner of such securities. The above shall not be deemed to be an admission by the record owners or the selling stockholder that they are themselves beneficial owners of these securities for purposes of Section 13(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or any other purpose. Wilmot Harkey and Daniel Mack are managing members of Nantahala Capital Management, LLC and may be deemed to have voting and dispositive power over the shares held by the selling stockholder. The pre-funded warrants and warrants are subject to a beneficial ownership limitation of 9.99%, which such limitation restricts the selling stockholder from exercising that portion of the pre-funded warrants or warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Blackwell Partners LLC – Series A is c/o Nantahala Capital Management, LLC, 130 Main St. 2nd Floor, New Canaan, CT 06840.
- (4) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 551,471 shares of common stock, (ii) 551,471 shares of common stock issuable upon the exercise of Series A common stock warrants and (iii) 551,471 shares of common stock issuable upon the exercise of Series B common stock warrants. Michael Bigger is the Managing Member of District 2 GP LLC, which is the General Partner of District 2 Capital Fund LP, and in such capacity has the right to vote and dispose of the securities held by such entity. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of District 2 Capital Fund LP is 14 Wall Street, Huntington, NY, 11743.
- (5) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 259,460 shares of common stock, (ii) 180,505 shares of common stock issuable upon the exercise of pre-funded warrants, (iii) 439,965 shares of common stock issuable upon the exercise of Series A common stock warrants and (iv) 439,965 shares of common stock issuable upon the exercise of Series B common stock warrants. Nantahala Capital Management, LLC is a Registered Investment Adviser and has been delegated the legal power to vote and/or direct the disposition of such securities on behalf of the selling stockholder as a General Partner, Investment Manager, or Sub-Advisor and would be considered the beneficial owner of such securities. The above shall not be deemed to be an admission by the record owners or the selling stockholder that they are themselves beneficial owners of these securities for purposes of Section 13(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or any other purpose. Wilmot Harkey and Daniel Mack are managing members of Nantahala Capital Management, LLC and may be deemed to have voting and dispositive power over the shares held by the selling stockholder. The pre-funded warrants and warrants are subject to a beneficial ownership limitation of 9.99%, which such limitation restricts the selling stockholder from exercising that portion of the pre-funded warrants or warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of NCP RFM LP is 130 Main St. 2nd Floor, New Canaan, CT 06840.
- (6) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 367,648 shares of common stock, (ii) 367,648 shares of common stock issuable upon the exercise of Series A common stock warrants and (iii) 367,648 shares of common stock issuable upon the exercise of Series B common stock warrants. Mitchell P. Kopin (“Mr. Kopin”) and Daniel B. Asher (“Mr. Asher”), each of whom are managers of Intracoastal Capital LLC (“Intracoastal”), have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to have beneficial ownership (as determined under Section 13(d) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) of the securities reported herein that are held by Intracoastal. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Intracoastal Capital LLC is 245 Palm Trail, Delray Beach FL, 33483.

- (7) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 367,648 shares of common stock, (ii) 367,648 shares of common stock issuable upon the exercise of Series A common stock warrants and (iii) 367,648 shares of common stock issuable upon the exercise of Series B common stock warrants. Jeff Easton is the Managing Member of The Lind Partners, LLC, which is the Investment Manager of Lind Global Fund II LP, and in such capacity has the right to vote and dispose of the securities held by such entity. The warrants are subject to a beneficial ownership limitation of 9.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Lind Global Fund II LP is 444 Madison Ave, 41st Floor New York, NY 10022.
- (8) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 255,742 shares of common stock, (ii) 255,742 shares of common stock issuable upon the exercise of Series A common stock warrants and (iii) 255,742 shares of common stock issuable upon the exercise of Series B common stock warrants. Nantahala Capital Management, LLC is a Registered Investment Adviser and has been delegated the legal power to vote and/or direct the disposition of such securities on behalf of the selling stockholder as a General Partner, Investment Manager, or Sub-Advisor and would be considered the beneficial owner of such securities. The above shall not be deemed to be an admission by the record owners or the selling stockholder that they are themselves beneficial owners of these securities for purposes of Section 13(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or any other purpose. Wilmot Harkey and Daniel Mack are managing members of Nantahala Capital Management, LLC and may be deemed to have voting and dispositive power over the shares held by the selling stockholder. The warrants are subject to a beneficial ownership limitation of 9.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Nantahala Capital Partners Limited Partnership is 130 Main St. 2nd Floor, New Canaan, CT 06840.
- (9) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 183,824 shares of common stock, (ii) 183,824 shares of common stock issuable upon the exercise of Series A common stock warrants and (iii) 183,824 shares of common stock issuable upon the exercise of Series B common stock warrants. Michael Bigger is the Managing Member of Bigger Capital GP, LLC, which is the General Partner of Bigger Capital Fund, LP, and in such capacity has the right to vote and dispose of the securities held by such entity. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Bigger Capital Fund, LP is 14 Wall Street, Huntington, NY, 11743.
- (10) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities purchased in the Private Placement: (i) 119,930 shares of common stock, (ii) 119,930 shares of common stock issuable upon the exercise of Series A common stock warrants and (iii) 119,930 shares of common stock issuable upon the exercise of Series B common stock warrants. Nantahala Capital Management, LLC is a Registered Investment Adviser and has been delegated the legal power to vote and/or direct the disposition of such securities on behalf of the selling stockholder as a General Partner, Investment Manager, or Sub-Advisor and would be considered the beneficial owner of such securities. The above shall not be deemed to be an admission by the record owners or the selling stockholder that they are themselves beneficial owners of these securities for purposes of Section 13(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, or any other purpose. Wilmot Harkey and Daniel Mack are managing members of Nantahala Capital Management, LLC and may be deemed to have voting and dispositive power over the shares held by the selling stockholder. The warrants are subject to a beneficial ownership limitation of 9.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The address of Nantahala Capital Partners II Limited Partnership is 130 Main St. 2nd Floor, New Canaan, CT 06840.

- (11) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 117,877 shares of common stock issuable upon the exercise of placement agent Series A common stock warrants and (ii) 117,877 shares of common stock issuable upon the exercise of placement agent Series B common stock warrants. The selling stockholder is affiliated with H.C. Wainwright & Co., LLC, a registered broker dealer with a registered address of H.C. Wainwright & Co., LLC, 430 Park Ave, 3rd Floor, New York, NY 10022, and has sole voting and dispositive power over the securities held. The number of shares beneficially owned prior to this offering consist of shares of common stock issuable upon exercise of placement agent warrants, which were received as compensation. The selling stockholder acquired the placement agent warrants in the ordinary course of business and, at the time the placement agent warrants were acquired, the selling stockholder had no agreement or understanding, directly or indirectly, with any person to distribute such securities. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation.
- (12) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 34,927 shares of common stock issuable upon the exercise of placement agent Series A common stock warrants and (ii) 34,926 shares of common stock issuable upon the exercise of placement agent Series B common stock warrants. The selling stockholder is affiliated with H.C. Wainwright & Co., LLC, a registered broker dealer with a registered address of H.C. Wainwright & Co., LLC, 430 Park Ave, 3rd Floor, New York, NY 10022, and has sole voting and dispositive power over the securities held. The number of shares beneficially owned prior to this offering consist of shares of common stock issuable upon exercise of placement agent warrants, which were received as compensation. The selling stockholder acquired the placement agent warrants in the ordinary course of business and, at the time the placement agent warrants were acquired, the selling stockholder had no agreement or understanding, directly or indirectly, with any person to distribute such securities. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation.
- (13) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 22,978 shares of common stock issuable upon the exercise of placement agent Series A common stock warrants and (ii) 22,978 shares of common stock issuable upon the exercise of placement agent Series B common stock warrants. The selling stockholder is affiliated with H.C. Wainwright & Co., LLC, a registered broker dealer with a registered address of H.C. Wainwright & Co., LLC, 430 Park Ave, 3rd Floor, New York, NY 10022, and has sole voting and dispositive power over the securities held. The number of shares beneficially owned prior to this offering consist of shares of common stock issuable upon exercise of placement agent warrants, which were received as compensation. The selling stockholder acquired the placement agent warrants in the ordinary course of business and, at the time the placement agent warrants were acquired, the selling stockholder had no agreement or understanding, directly or indirectly, with any person to distribute such securities. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation.
- (14) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 6,204 shares of common stock issuable upon the exercise of placement agent Series A common stock warrants and (ii) 6,204 shares of common stock issuable upon the exercise of placement agent Series B common stock warrants. The selling stockholder is affiliated with H.C. Wainwright & Co., LLC, a registered broker dealer with a registered address of H.C. Wainwright & Co., LLC, 430 Park Ave, 3rd Floor, New York, NY 10022, and has sole voting and dispositive power over the securities held. The number of shares beneficially owned prior to this offering consist of shares of common stock issuable upon exercise of placement agent warrants, which were received as compensation. The selling stockholder acquired the placement agent warrants in the ordinary course of business and, at the time the placement agent warrants were acquired, the selling stockholder had no agreement or understanding, directly or indirectly, with any person to distribute such securities. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation.
- (15) The shares reported under “Beneficial Ownership Prior to This Offering” consist of the following securities issued in the Private Placement: (i) 1,838 shares of common stock issuable upon the exercise of placement agent Series A common stock warrants and (ii) 1,838 shares of common stock issuable upon the exercise of placement agent Series B common stock warrants. The selling stockholder is affiliated with H.C. Wainwright & Co., LLC, a registered broker dealer with a registered address of H.C. Wainwright & Co., LLC, 430 Park Ave, 3rd Floor, New York, NY 10022, and has sole voting and dispositive power over the securities held. The number of shares beneficially owned prior to this offering consist of shares of common stock issuable upon exercise of placement agent warrants, which were received as compensation. The selling stockholder acquired the placement agent warrants in the ordinary course of business and, at the time the placement agent warrants were acquired, the selling stockholder had no agreement or understanding, directly or indirectly, with any person to distribute such securities. The warrants are subject to a beneficial ownership limitation of 4.99%, which such limitation restricts the selling stockholder from exercising that portion of the warrants that would result in the selling stockholder and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation.

PLAN OF DISTRIBUTION

Each selling stockholder and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their shares of common stock covered hereby on The Nasdaq Global Market or any other stock exchange, market or trading facility on which the securities are traded or in private transactions. These sales may be at fixed or negotiated prices. A selling stockholder may use any one or more of the following methods when selling such shares of common stock:

- 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 of common stock 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;
- settlement of short sales;
- in transactions through broker-dealers that agree with the selling stockholders to sell a specified number of such shares of common stock at a stipulated price per security;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell the shares of common stock under Rule 144 or any other exemption from registration under the Securities Act of 1933, as amended, if available, rather than under this prospectus.

Broker-dealers engaged by the selling stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling stockholders (or, if any broker-dealer acts as agent for the purchaser of securities, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2121; and in the case of a principal transaction a markup or markdown in compliance with FINRA Rule 2121.

In connection with the sale of the shares of common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the securities in the course of hedging the positions they assume. The selling stockholders may also sell the shares of common stock short and deliver these securities to close out their short positions, or loan or pledge the securities to broker-dealers that in turn may sell the shares of the common stock. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of the shares of common stock offered by this prospectus, which securities such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The selling stockholders and any broker-dealers or agents that are involved in selling the shares of common stock may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the securities purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each selling stockholder has informed us that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the shares of common stock.

We are required to pay certain fees and expenses incurred by us incident to the registration of the shares of common stock. We have agreed to indemnify the selling stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

We have agreed to keep the registration statement of which this prospectus forms a part effective until the earlier of (i) the date on which the shares of common stock may be resold by the selling stockholders without registration and without regard to any volume or manner-of-sale limitations by reason of Rule 144, without the requirement for us to be in compliance with the current public information under Rule 144 under the Securities Act or any other rule of similar effect, and (ii) all of the shares of common stock have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The shares of common stock will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the shares of common stock covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Securities Exchange Act of 1934, as amended, any person engaged in the distribution of the shares of common stock may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the selling stockholders will be subject to applicable provisions of the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of the common stock by the selling stockholders or any other person. We will make copies of this prospectus available to the selling stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

LEGAL MATTERS

Cooley LLP, Palo Alto, California, will pass upon the validity of the shares of our common stock offered by this prospectus.

EXPERTS

WithumSmith+Brown, PC, independent registered public accounting firm, has audited our consolidated financial statements and related schedule included in our Annual Report on Form 10-K for the year ended December 31, 2022, as set forth in their report dated March 31, 2023, which includes an explanatory paragraph relating to AcelRx Pharmaceuticals, Inc.'s ability to continue as a going concern, except for the effects of the discontinued operations disclosed in Note 3, as to which the date is July 31, 2023, which appears in our Current Report on Form 8-K dated July 31, 2023, both of which are incorporated by reference in this prospectus and elsewhere in the registration statement. Such financial statements are incorporated by reference in reliance on WithumSmith+Brown, PC's report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

This prospectus is part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and does not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated by reference into this prospectus for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, 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>. Our website address is <http://www.acelrx.com>. Information contained on or accessible through our website is not a part of this prospectus and is not incorporated by reference herein, and the inclusion of our website address in this prospectus is an inactive textual reference only.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to “incorporate by reference” information from other documents that we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus. Information in this prospectus supersedes information incorporated by reference that we filed with the SEC prior to the date of this prospectus, while information that we file later with the SEC will automatically update and supersede the information in this prospectus. We incorporate by reference into this prospectus and the registration statement of which this prospectus is a part the information or documents listed below that we have filed with the SEC (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary):

- [our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on March 31, 2023](#); as amended by our [Annual Report on Form 10-K/A for the year ended December 31, 2022, filed with the SEC on May 1, 2023](#);
- [our Quarterly Report on Form 10-Q for the three months ended March 31, 2023, filed with the SEC on May 10, 2023](#);
- our Current Reports on Form 8-K, which were filed with the SEC on [March 16, 2023](#), [March 30, 2023](#), [April 7, 2023](#), [April 28, 2023](#) and [June 15, 2023](#); [July 21, 2023](#) and [August 1, 2023](#); and
- the description of our common stock in our registration statement on [Form 8-A filed with the SEC on February 1, 2011](#), as updated by [Exhibit 4.1 to our Annual Report on Form 10-K for the year ended December 31, 2020, filed with the SEC on March 15, 2021](#), and any amendments or reports filed for the purpose of updating such description.

All filings filed by us pursuant to the Exchange Act after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of the registration statement shall be deemed to be incorporated by reference into this prospectus.

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the securities made by this prospectus and will become a part of this prospectus from the date that such documents are filed with the SEC. Information in such future filings updates and supplements the information provided in this prospectus. Any statements in any such future filings will automatically be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

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

AcelRx Pharmaceuticals, Inc.
25821 Industrial Boulevard, Suite 400
Hayward, California 94545
Attn: Investor Relations
(650) 216-3500