

Recro Pharma, Inc.
Form 424B5
February 19, 2019
Table of Contents

Filed Pursuant to Rule 424(b)(5)
Registration No. 333-218487

PROSPECTUS SUPPLEMENT

To Prospectus dated June 12, 2017

\$20,000,000 OF COMMON STOCK
PLUS 34,762 COMMITMENT SHARES

Pursuant to this prospectus supplement and the accompanying prospectus, we are offering up to \$20,000,000 of shares of our common stock, \$0.01 par value per share, or the common stock, plus 34,762 shares of common stock, or the Commitment Shares, to Aspire Capital Fund, LLC, or Aspire Capital, pursuant to a common stock purchase agreement, or the Purchase Agreement, entered into with Aspire Capital on February 19, 2019.

The shares offered under this prospectus supplement (other than the Commitment Shares, which are being issued to Aspire Capital in consideration for entering into the Purchase Agreement) may be sold from time to time to Aspire Capital until and including August 19, 2021, with an aggregate offering price of up to \$20,000,000, or the Purchase Shares. The purchase price for the Purchase Shares will be based upon one of two formulas set forth in the Purchase Agreement as described herein on page S-13 depending on the type of purchase notice we submit to Aspire Capital from time to time.

Our common stock is quoted on the NASDAQ Capital Market under the symbol REPH. On February 15, 2019, the last reported sale price of our common stock was \$8.67 per share.

We are an emerging growth company as defined by the Jumpstart Our Business Startups Act of 2012 and, as such, we are eligible for reduced public company reporting requirements. Please see Summary Implications of Being an Emerging Growth Company.

Investing in our common stock involves a high degree of risk. See Risk Factors beginning on page S-5 of this prospectus supplement, page 5 of the accompanying prospectus and under similar headings in the documents incorporated by reference into this prospectus supplement and the accompanying prospectus.

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

The date of this prospectus supplement is February 19, 2019.

Table of Contents

TABLE OF CONTENTS

Prospectus Supplement

	Page
<u>ABOUT THIS PROSPECTUS SUPPLEMENT</u>	S-ii
<u>SUMMARY</u>	S-1
<u>THE OFFERING</u>	S-3
<u>RISK FACTORS</u>	S-5
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	S-8
<u>USE OF PROCEEDS</u>	S-10
<u>DILUTION</u>	S-11
<u>THE ASPIRE TRANSACTION</u>	S-13
<u>PLAN OF DISTRIBUTION</u>	S-17
<u>LEGAL MATTERS</u>	S-18
<u>EXPERTS</u>	S-18
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	S-19
<u>INCORPORATION OF CERTAIN INFORMATION BY REFERENCE</u>	S-19
Accompanying Prospectus	

<u>ABOUT THIS PROSPECTUS</u>	ii
<u>FORWARD-LOOKING STATEMENTS</u>	1
<u>THE COMPANY</u>	3
<u>RISK FACTORS</u>	5
<u>USE OF PROCEEDS</u>	5
<u>GENERAL DESCRIPTION OF OUR SECURITIES</u>	6
<u>DESCRIPTION OF OUR CAPITAL STOCK</u>	6
<u>DESCRIPTION OF OUR WARRANTS</u>	9
<u>DESCRIPTION OF OUR DEBT SECURITIES</u>	11
<u>DESCRIPTION OF OUR UNITS</u>	16
<u>DESCRIPTION OF OUR SUBSCRIPTION RIGHTS</u>	16
<u>PLAN OF DISTRIBUTION</u>	17
<u>LEGAL MATTERS</u>	20
<u>EXPERTS</u>	20
<u>INCORPORATION BY REFERENCE</u>	20
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	21

Table of Contents

ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus form part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or SEC, utilizing a shelf registration process. This document contains two parts. The first part consists of this prospectus supplement, which provides you with specific information about this offering. The second part, the accompanying prospectus, provides more general information, some of which may not apply to this offering. Generally, when we refer only to the prospectus we are referring to both parts combined. This prospectus supplement may add, update or change information contained in the accompanying prospectus. To the extent that any statement we make in this prospectus supplement is inconsistent with statements made in the accompanying prospectus or any documents incorporated by reference herein or therein, the statements made in this prospectus supplement will be deemed to modify or supersede those made in the accompanying prospectus and such documents incorporated by reference herein and therein. You should carefully read this prospectus supplement and the accompanying prospectus, including the information incorporated by reference herein and therein, and any related free writing prospectus that we have authorized for use in connection with this offering.

You should rely only on the information that we have included or incorporated by reference in this prospectus supplement, the accompanying prospectus and any related free writing prospectus that we may authorize to be provided to you. We have not authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus supplement, the accompanying prospectus or any related free writing prospectus that we may authorize to be provided to you. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus supplement, the accompanying prospectus or any related free writing prospectus. This prospectus supplement, the accompanying prospectus and any related free writing prospectus do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus supplement, the accompanying prospectus or any related free writing prospectus constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction.

You should not assume that the information contained in this prospectus supplement, the accompanying prospectus or any related free writing prospectus is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference herein or therein is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus supplement, the accompanying prospectus or any related free writing prospectus is delivered, or securities are sold, on a later date.

This prospectus supplement contains or incorporates by reference 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 or will be filed or have been or will be incorporated by reference as exhibits to the registration statement of which this prospectus supplement forms a part, and you may obtain copies of those documents as described in this prospectus supplement under the heading **Where You Can Find More Information**.

Solely for convenience, tradenames referred to in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference appear without the ® or TM symbol, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or that the applicable owner will not assert its rights, to these tradenames.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any filing that is incorporated or deemed to be incorporated by reference into this prospectus supplement or

the accompanying prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

References in this prospectus to the terms the Company, Recro, we, our and us or other similar terms mean Recro Pharma, Inc. and our wholly owned subsidiaries, unless we state otherwise or the context indicates otherwise.

S-ii

Table of Contents

SUMMARY

This summary highlights selected information about us, this offering and information appearing elsewhere in this prospectus supplement, in the accompanying prospectus and in the documents we incorporate by reference. This summary is not complete and does not contain all the information you should consider before investing in our common stock pursuant to this prospectus supplement and the accompanying prospectus. Before making an investment decision, to fully understand this offering and its consequences to you, you should carefully read this entire prospectus supplement and the accompanying prospectus, including Risk Factors beginning on page S-5 of this prospectus supplement and the financial statements and related notes and the other information incorporated by reference herein, including our Annual Report on Form 10-K for the year ended December 31, 2018, especially the risks described under Risk Factors in Part I, Item 1A therein, and subsequent Quarterly Reports on Form 10-Q that we file from time to time.

Overview

We are a specialty pharmaceutical company that operates through two business segments: an Acute Care segment and a revenue-generating contract development and manufacturing, or CDMO segment, through which we operate a revenue generating manufacturing business in Gainesville, Georgia. We believe that we can bring valuable therapeutic options for patients, prescribers and payers, such as our lead product candidate, injectable meloxicam, to the hospital and related acute care markets. We believe we can create value for our shareholders through the development, registration and commercialization of injectable meloxicam and our other pipeline product candidates, as well as through the ongoing contributions of our cash-flow positive CDMO segment. In addition to our pipeline, we continue to evaluate acquisition, out-licensing and in-licensing opportunities.

Acute Care

Our Acute Care segment is primarily focused on developing and commercializing innovative products for hospital and related acute care settings. Our lead product candidate is a proprietary injectable form of meloxicam, a long-acting preferential COX-2 inhibitor. Intravenous, or IV, meloxicam has successfully completed three Phase III clinical trials, including two pivotal efficacy trials, a large double-blind Phase III safety trial and other safety studies for the management of moderate to severe pain. Overall, the total new drug application, or NDA, program included over 1,400 patients. In July 2017, we submitted an NDA to the Food and Drug Administration, or FDA, for IV meloxicam for the management of moderate to severe pain. In May 2018, we received a Complete Response Letter, or CRL, from the FDA regarding our NDA for IV meloxicam. In July 2018, we participated in a Type A End-of-Review meeting with the FDA to discuss the topics covered in the CRL. In September 2018, we resubmitted the NDA for IV meloxicam and the FDA has set a date for decision on the NDA under the Prescription Drug User Fee Act, or PDUFA, of March 24, 2019. We believe that IV meloxicam compares favorably to competitive therapies in onset of pain relief, duration of pain relief, extent of pain relief and time to peak analgesic effect as well as that it has been well tolerated. We believe injectable meloxicam, as a non-opioid product, will overcome many of the issues associated with commonly prescribed opioid therapeutics, including respiratory depression, excessive nausea and vomiting, constipation, as well having no addiction potential, while maintaining analgesic, or pain relieving, effects. We are pursuing a Section 505(b)(2) regulatory strategy for IV meloxicam.

Our pipeline also includes other early-stage product candidates, including two novel neuromuscular blocking agents, or NMBAs, and a related proprietary chemical reversal agent and Dex-IN, a proprietary intranasal formulation of dexmedetomidine, or Dex, an alpha-2 adrenergic agonist that we are evaluating for possible partnering.

CDMO

Our CDMO segment leverages formulation expertise to develop and manufacture pharmaceutical products using proprietary delivery technologies and know-how for partners who plan to develop and commercialize these products. These collaborations result in revenue streams including manufacturing, royalties, profit sharing, and research and development, which support continued operations for our CDMO segment and have contributed excess cash flow to be used for activities in our Acute Care segment. We operate a 97,000 square foot, Drug Enforcement Agency, or DEA,-licensed manufacturing facility and a 24,000 square foot development and high potency facility, each in Gainesville, Georgia. We currently manufacture the following key products with our commercial partners: Ritalin LA[®], Focalin XR[®], Verelan PM[®], Verelan SR[®], Verapamil PM, Verapamil SR and Zohydro ER[®], as well as supporting multiple development stage products.

S-1

Table of Contents

Corporate Information

We were incorporated under the laws of the Commonwealth of Pennsylvania in November 2007. Our principal executive offices are located at 490 Lapp Road, Malvern, PA 19355, and our telephone number is (484) 395-2470.

Available Information

Our website address is *www.recropharma.com*. The information contained in, or accessible through, our website does not constitute part of this prospectus. We make available free of charge on our website our annual, quarterly and current reports, including amendments to such reports, as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the SEC. Information contained on our website is not incorporated by reference into this prospectus supplement or the accompanying prospectus, and you should not consider information contained on our website as part of this prospectus supplement or the accompanying prospectus.

Implications of Being an Emerging Growth Company

We are an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. We will remain an emerging growth company until the earliest of (1) December 31, 2019 and (2) the date on which we have, during the previous three-year period, issued more than \$1.0 billion in non-convertible debt securities.

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

The JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we are subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Table of Contents

THE OFFERING

Common stock offered by us	Up to \$20,000,000 of shares of our common stock, par value \$0.01 per share.
Common stock to be outstanding after this offering	24,141,528 shares assuming the issuance of 34,762 Commitment Shares and 2,306,805 Purchase Shares at a price of \$8.67 per share, which was the closing price of our common stock on the NASDAQ Capital Market on February 15, 2019. The number of actual Purchase Shares that may be issued will vary depending on the sales prices under this offering. The number of shares that may be issued in this offering is limited to 4,372,373 shares, except in certain circumstances. See The Aspire Transaction Purchase of Shares under the Purchase Agreement below for a description of the share limitation.
Manner of Offering	Issuance to Aspire Capital of 34,762 Commitment Shares and sales of Purchase Shares to Aspire Capital from time to time, subject to certain minimum stock price requirements and daily caps for an aggregate offering price of up to \$20,000,000. See The Aspire Transaction and Plan of Distribution .
Use of proceeds	We intend to use the net proceeds from this offering for preparatory commercial activities for IV meloxicam, pipeline development activities, the payment of milestones to Alkermes plc, or Alkermes pursuant to our acquisition agreement related to IV meloxicam, and general corporate purposes. See Use of Proceeds .
Risk Factors	An investment in our common stock involves a high degree of risk. See Risk Factors beginning on page S-5 of this prospectus supplement and page 5 of the accompanying prospectus and in Part I, Item 1A of the Annual Report on Form 10-K for the fiscal year ended December 31, 2018, as well as the other information incorporated by reference into this prospectus supplement and the accompanying prospectus for a discussion of risks you should carefully consider before investing in our securities.
NASDAQ Capital Market symbol	REPH
Outstanding Shares	

The number of shares of our common stock to be outstanding after this offering is based on 21,799,961 shares of our common stock outstanding as of December 31, 2018, and excludes:

3,775,065 shares of our common stock issuable upon the exercise of stock options outstanding as of December 31, 2018 at a weighted-average exercise price of \$7.62 per share;

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1,103,396 shares of our common stock issuable upon the vesting and settlement of restricted stock units outstanding as of December 31, 2018;

3,777,352 shares of our common stock available for future issuance as of December 31, 2018 under our Amended and Restated Equity Incentive Plan;

838,664 shares of our common stock issuable upon the exercise of outstanding warrants as of December 31, 2018 with a weighted average exercise price of \$8.29 per share;

\$40,000,000 of shares of our common stock issuable under a sales agreement with Cowen and Company, LLC, or Cowen, relating to the sale of shares of our common stock in an at-the-market offering program, or the ATM program (4,613,610 shares based on an assumed sale price of \$8.67 per share, the last reported share price of our common stock on the NASDAQ Capital Market on February 15, 2019); and

S-3

Table of Contents

\$3.0 million of shares of our common stock issuable under the Common Stock Purchase Agreement with Aspire Capital dated March 2, 2018, or the 2018 Purchase Agreement, relating to the sale of shares of our common stock (346,084 shares based on an assumed sale price of \$8.67 per share, the last reported share price of our common stock on the NASDAQ Capital Market on February 15, 2019).

S-4

Table of Contents

RISK FACTORS

*An investment in our common stock involves a high degree of risk. Before deciding whether to invest in our common stock, you should carefully consider the risks described below and those discussed under the Section captioned **Risk Factors** contained in our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, as updated by our subsequent filings under the Securities Exchange Act of 1934, as amended, or the Exchange Act, which are incorporated by reference in this prospectus supplement and the accompanying prospectus, together with other information in this prospectus supplement, the accompanying prospectus, the information and documents incorporated by reference herein and therein, and in any free writing prospectus that we have authorized for use in connection with this offering. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could be harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment.*

Risks Related to This Offering

If you purchase shares of common stock in this offering, you may suffer immediate dilution of your investment and the sale of the shares of our common stock acquired in this offering could cause the price of our common stock to decline.

The shares sold in this offering will be sold from time to time at various prices, however the offering prices for the Purchase Shares may be substantially higher than the net tangible book value per share of our common stock. If you purchase shares of our common stock in this offering, you may pay a price per share that substantially exceeds our net tangible book value per share after this offering.

In addition, this prospectus relates to \$20,000,000 of shares of our common stock and 34,762 Commitment Shares, the sale and issuance of which may result in substantial dilution to the interests of other holders of our common stock, and such sales and issuances, or the anticipation of such sales and issuances, may cause the trading price of our common stock to decline. Our market liquidity is limited and resales by you of the shares that you acquire in this offering may also cause the trading price of our common stock to decline.

The number of shares ultimately sold by us under this prospectus is dependent upon the number of shares we elect to sell to Aspire Capital under the Purchase Agreement. We have the right under the Purchase Agreement to control the timing and amount of sales of our shares to Aspire Capital, and the Purchase Agreement may be terminated by us at any time at our discretion without any penalty or cost to us. At our discretion, Aspire Capital may ultimately purchase all, some or none of the \$20,000,000 of common stock that, together with the Commitment Shares, is the subject of this prospectus. Aspire Capital may sell all, some or none of our shares that it purchases under the Purchase Agreement and any such sales may cause the trading price of our common stock to decline.

Management will have broad discretion as to the use of the proceeds from this offering, and we may not use the proceeds effectively.

Our management will have broad discretion with respect to the use of proceeds of this offering, including for any of the purposes described in the section of this prospectus supplement entitled **Use of Proceeds**. You will be relying on the judgment of our management regarding the application of the proceeds of this offering. The results and effectiveness of the use of proceeds are uncertain, and we could spend the proceeds in ways that you do not agree with or that do not improve our results of operations or enhance the value of our common stock. Our failure to apply these funds effectively could harm our business, delay the development or commercialization, if approved, of our product candidates and cause the price of our common stock to decline.

Issuances of shares of common stock or securities convertible into or exercisable for shares of common stock following this offering, as well as the exercise of options and warrants outstanding, will dilute your ownership interests and may adversely affect the future market price of our common stock.

We will need additional capital to fund the commercialization of IV meloxicam, if approved, and the development of our other product candidates. We may seek additional capital through a

S-5

Table of Contents

combination of private and public equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements, which may cause your ownership interest to be diluted. For example, on December 29, 2017, we entered into the ATM Program with Cowen, pursuant to which we may sell from time to time, at our option, up to \$40,000,000 of shares of our common stock through Cowen as our placement agent. On March 2, 2018, we entered into the 2018 Purchase Agreement, pursuant to which, upon the terms and subject to the conditions and limitations set forth in the 2018 Purchase Agreement, Aspire Capital is committed to purchase, at our sole election, up to an aggregate of \$20,000,000 of our shares of common stock over the approximately 30-month term of the 2018 Purchase Agreement. Through December 31, 2018, we have sold \$17.0 million in shares of our common stock under the 2018 Purchase Agreement. Any sales under the Sales Agreement and the 2018 Purchase Agreement may cause your ownership interest to be diluted. In addition, we have a significant number of options and warrants to purchase shares of our common stock outstanding. If these securities are exercised, you may incur further dilution. Moreover, to the extent that we issue additional options or warrants to purchase, or securities convertible into or exchangeable for, shares of our common stock in the future and those options, warrants or other securities are exercised, converted or exchanged, shareholders may experience further dilution.

A substantial number of shares of common stock may be sold in the market at any point, which may depress the market price for our common stock.

Sales of a substantial number of shares of our common stock in the public market, either by us, Aspire Capital or by our current shareholders, or the perception that these sales could occur, could cause a decline in the market price of our securities. Such sales, along with any other market transactions, could adversely affect the market price of our common stock. Our outstanding shares of common stock may be freely sold in the public market at any time to the extent permitted by Rules 144 and 701 under the Securities Act or to the extent such shares have already been registered under the Securities Act and are held by non-affiliates of ours.

As of February 15, 2019, there were approximately 6,380,084 shares subject to outstanding options and restricted stock unit awards or that are otherwise issuable under our equity compensation plans, all of which shares we have registered under the Securities Act of 1933, as amended, on a registration statement on Form S-8. The registered shares can be freely sold in the public market upon issuance, subject to volume limitations applicable to affiliates, to the extent applicable.

The market price and trading volume of our common stock have been and may continue to be volatile.

The market price for our common stock has been volatile and may continue to fluctuate or may decline significantly in the future. An active, liquid and orderly market for our common stock may not be sustained, which could depress the trading price of our common stock or cause it to continue to be highly volatile or subject to wide fluctuations. Some of the factors that could negatively affect our share price or result in fluctuations in the price or trading volume of our common stock include, among other things:

our ability to resolve the deficiencies identified by the FDA in the CRL for IV meloxicam and obtain regulatory approval of IV meloxicam;

the approved labeling for IV meloxicam, if any;

our ability to successfully commercialize IV meloxicam if approved;

FDA, state or international regulatory actions, including actions on regulatory applications for any of our product candidates;

legislative or regulatory changes;

judicial pronouncements interpreting laws and regulations;

changes in government programs;

S-6

Table of Contents

announcements of new products, services or technologies, commercial relationships, acquisitions or other events by us or our competitors;

market conditions in the pharmaceutical and biotechnology sectors;

fluctuations in stock market prices and trading volumes of similar companies;

changes in accounting principles;

litigation or public concern about the safety of our product candidates or similar product candidates;

sales of large blocks of our common stock, including sales by our executive officers, directors and significant shareholders;

our announcement of financing transactions, including debt, convertible notes, etc.;

actions by institutional or activist shareholders; and

our discontinuance, licensing or sale of any asset or segment of our business.

These broad market and industry factors may decrease the market price of our common stock, regardless of our actual operating performance. For example, on May 24, 2018, we announced the receipt from the FDA of a CRL for our NDA for IV meloxicam. The announcement was followed by a substantial decrease in the trading price of our common stock on the Nasdaq Capital Market. In addition, in the past, following periods of volatility in the overall market and decreases in the market price of a company's securities, securities class action litigation has often been instituted against these companies. Following the decrease in our trading price in May 2018, a securities class action lawsuit was filed against us and certain of our officers and directors for alleged violations of Section 10(b) and 20(a) of the Exchange Act and Rule 10(b)(5) promulgated thereunder. The complaint seeks unspecified damages, interest, attorneys' fees and other costs. On December 10, 2018, lead plaintiff filed an amended complaint that asserted the same claims and sought the same relief but included new allegations and named additional officers and directors as defendants. On February 8, 2019, we filed a motion to dismiss the amended complaint in its entirety. While we believe that the lawsuit is without merit and intend to vigorously defend against it, the lawsuit is in the early stages and, at this time, no assessment can be made as to its likely outcome or whether the outcome will be material to us. This litigation, and any other securities class actions that may be brought against us, could result in substantial costs and a diversion of our management's attention and resources.

Table of Contents

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein contain forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this prospectus supplement, the accompanying prospectus or the documents incorporated herein or therein by reference 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, plan, predict, project, will, would or the negative of these words and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Such statements are based on assumptions and expectations that may not be realized and are inherently subject to risks, uncertainties and other factors, many of which cannot be predicted with accuracy and some of which might not even be anticipated.

Any forward-looking statements should be considered in light of the risks and uncertainties referred to in this prospectus and our Annual Report on Form 10-K for the year ended December 31, 2018 and subsequent filings with the SEC that are incorporated by reference in this prospectus. Any forward-looking statements represent our estimates only as of the date this prospectus supplement is filed with the SEC and should not be relied upon as representing estimates as of any subsequent date. We do not assume any obligation to update any forward-looking statements. We disclaim any intention or obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise. The forward-looking statements in this prospectus and the documents incorporated herein and therein by reference include, among other things, statements about:

our ability to resolve the deficiencies identified by the FDA in the CRL for IV meloxicam;

whether the FDA will approve our amended NDA for IV meloxicam and, if approved, the labeling under any such approval that we may obtain;

if the FDA does not approve our amended NDA, the time frame otherwise associated with resolving the deficiencies identified by the FDA in the CRL and whether the FDA will require additional clinical studies to support the approval of IV meloxicam and the time and cost of such studies;

our ability to successfully commercialize IV meloxicam or our other product candidates, upon regulatory approval;

our ability to generate sales and other revenues from IV meloxicam or any of our other product candidates, once approved, including setting an acceptable price for and obtaining adequate coverage and reimbursement of such products;

the results, timing and outcome of our clinical trials of IV meloxicam or our other product candidates, and any future clinical and preclinical studies;

our ability to raise future financing and attain profitability for continued development of our business and our product candidates and to meet required debt payments, and any milestone payments owing to Alkermes or our other licensing and collaboration partners;

our ability to comply with the regulatory schemes applicable to our business and other regulatory developments in the United States and foreign countries;

our ability to operate under increased leverage and associated lending covenants;

the performance of third-parties upon which we depend, including third-party contract research organizations, or CRO s, and third-party suppliers, manufacturers, group purchasing organizations, distributors and logistics providers;

our ability to obtain and maintain patent protection and defend our intellectual property rights against third-parties;

S-8

Table of Contents

our ability to maintain our relationships, profitability and contracts with our key commercial partners;
our ability to defend the securities class action lawsuit filed against us, or any future material litigation filed against us;
our ability to recruit or retain key scientific, technical, commercial, and management personnel or to retain our executive officers;
our ability to comply with stringent U.S. and foreign government regulation in the manufacture of pharmaceutical products, including Good Manufacturing Practice compliance and U.S. Drug Enforcement Agency compliance and other relevant regulatory authorities; and
the effects of changes in our effective tax rate due to changes in the mix of earnings in countries with differing statutory tax rates, changes in tax strategy, changes in the valuation of deferred tax assets and liabilities and changes in the tax laws.

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 in this prospectus and our Form 10-K for the year ended December 31, 2018, particularly under 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 supplement, the accompanying prospectus and the documents that we incorporate by reference herein and therein 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 update any forward-looking statements.

Table of Contents

USE OF PROCEEDS

We intend to use the net proceeds of the proposed offering, if any, for commercial activities for IV meloxicam, pipeline development activities, the payment of milestones to Alkermes pursuant to our acquisition agreement related to IV meloxicam, and general corporate purposes.

These expected uses represent our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. Our actual expenditures may vary significantly depending on a number of factors, including FDA approval of IV meloxicam and the success of our commercial launch of IV meloxicam, if approved. As of the date of this prospectus, we cannot specify with certainty all of the particular uses for the net proceeds to us from this offering. Accordingly, our management will have broad discretion in the application of these proceeds. Pending application of the net proceeds of this offering, if any, received from time to time in connection with purchases under the Purchase Agreement as described above, we intend to invest the net proceeds of this offering in short-term, investment-grade, interest-bearing securities.

S-10

Table of Contents

DILUTION

If you invest in our common stock, your interest will be immediately diluted to the extent of the difference between the public offering price per share and the as adjusted net tangible book value per share of our common stock after this offering. Net tangible book value per share represents our total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding.

As of December 31, 2018, our net tangible book value was (\$58.2) million, or (\$2.67) per share of common stock. After giving effect to (i) the issuance and sale of 34,762 Commitment Shares, and (ii) the assumed issuance and sale of 2,306,805 Purchase Shares in the aggregate amount of \$20.0 million at an assumed average offering price of \$8.67 per share, which was the closing price of our common stock on the NASDAQ Capital Market on February 15, 2019, and after deducting estimated offering expenses payable by us, our as adjusted net tangible book value as of December 31, 2018 would have been approximately (\$38.3) million, or approximately (\$1.59) per share. This represents an immediate increase in as adjusted net tangible book value to existing shareholders of \$1.08 per share and an immediate dilution in as adjusted net tangible book value of \$10.26 per share of our common stock to the investors purchasing securities in this offering.

The following table illustrates this per share dilution:

Assumed average offering price per share	\$ 8.67
Net tangible book value per share at December 31, 2018	\$ (2.67)
Increase in net tangible book value per share attributable to new investors purchasing shares in this offering	\$ 1.08
As adjusted net tangible book value per share after this offering	\$ (1.59)
Dilution per share to new investors participating in this offering	\$ 10.26

The actual price at which we sell Purchase Shares in this offering may be higher or lower than this assumed average price of \$8.67 per share, which was the closing price of our common stock on the NASDAQ Capital Market on February 15, 2019, and the total amount of Purchase Shares that we sell in this offering may be lower than \$20.0 million. An increase of \$1.00 per share in the price at which the Purchase Shares are sold from the assumed average offering price of \$8.67 per share shown in the table above, assuming we sell \$20.0 million in Purchase Shares at that price, would increase our adjusted net tangible book value per share after this offering to \$(1.60) per share and would result in dilution in net tangible book value per share to new investors in this offering of \$11.27 per share, after deducting estimated aggregate offering expenses payable by us.

The foregoing table and calculations are based on 21,799,961 shares of our common stock outstanding as of December 31, 2018, and excludes:

3,775,065 shares of our common stock issuable upon the exercise of stock options outstanding as of December 31, 2018 at a weighted-average exercise price of \$7.62 per share;

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1,103,396 shares of our common stock issuable upon the vesting and settlement of restricted stock units outstanding as of December 31, 2018;

3,777,352 shares of our common stock available for future issuance as of December 31, 2018 under our Amended and Restated Equity Incentive Plan;

838,664 shares of our common stock issuable upon the exercise of outstanding warrants as of December 31, 2018 with a weighted average exercise price of \$8.29 per share;

\$40,000,000 of shares of our common stock issuable under a sales agreement with Cowen and Company, LLC, or Cowen, relating to the sale of shares of our common stock in an at-the-market offering program, or the ATM program (4,613,610 shares based on an assumed sale price of \$8.67 per share, the last reported share price of our common stock on the NASDAQ Capital Market on February 15, 2019); and

S-11

Table of Contents

\$3.0 million of shares of our common stock issuable under 2018 Purchase Agreement relating to the sale of shares of our common stock (346,084 shares based on an assumed sale price of \$8.67 per share, the last reported share price of our common stock on the NASDAQ Capital Market on February 15, 2019).

S-12

Table of Contents

THE ASPIRE TRANSACTION

General

The Purchase Agreement provides that upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is obligated to purchase up to an aggregate of \$20.0 of Purchase Shares from time to time over the term of the Purchase Agreement from us and that, as consideration for entering into the Purchase Agreement, we will issue 34,762 Commitment Shares to Aspire Capital. On February 19, 2019, the conditions necessary for purchases under the Purchase Agreement to commence were satisfied. The following is a summary of the Purchase Agreement with Aspire Capital.

Purchase of Shares under the Purchase Agreement

On any business day over the 30-month term of the Purchase Agreement (until August 19, 2021), we have the right, in our sole discretion, to present Aspire Capital with a purchase notice, or a Purchase Notice, directing Aspire Capital to purchase up to 75,000 Purchase Shares per business day; however, no sale pursuant to a Purchase Notice may exceed \$500,000 per trading day, unless we and Aspire Capital mutually agree. We and Aspire Capital also may mutually agree to increase the number of shares that may be sold to as much as an additional 2,000,000 Purchase Shares per trading day. The purchase price per Purchase Share pursuant to such Purchase Notice, or the Purchase Price, is the lower of:

- (i) the lowest sale price for our common stock on the date of sale; or
- (ii) the average of the three lowest closing sale prices for our common stock during the ten consecutive business days ending on the business day immediately preceding the purchase date.

The applicable Purchase Price will be determined prior to delivery of any Purchase Notice. The Purchase Agreement provides that we and Aspire Capital shall not affect any sales under the Purchase Agreement on any purchase date where the closing sale price of our common stock is less than \$0.50 per share.

In addition, on any date on which we submit a Purchase Notice to Aspire Capital, we also have the right, in our sole discretion, to present Aspire Capital with a volume-weighted average price purchase notice, or a VWAP Purchase Notice, directing Aspire Capital to purchase an amount of our common stock equal to up to 30% of the aggregate shares of common stock traded on the next business day, or the VWAP Purchase Date, subject to a maximum number of shares determined by us, or the VWAP Purchase Share Volume Maximum. The purchase price per Purchase Share pursuant to such VWAP Purchase Notice, or the VWAP Purchase Price, shall be the lesser of the closing sale on the VWAP Purchase Date or 97% of the volume weighted average price for our common stock traded on (i) the VWAP Purchase Date if the aggregate shares to be purchased on that date does not exceed the VWAP Purchase Share Volume Maximum, or (ii) the portion of such business day until such time as the aggregate shares to be purchased will equal the VWAP Purchase Share Volume Maximum.

The number of Purchase Shares covered by and timing of each Purchase Notice or VWAP Purchase Notice are determined by us, at our sole discretion. The aggregate number of shares that we can sell to Aspire Capital under the Purchase Agreement may in no case exceed 4,372,373 shares of our common stock (which is equal to approximately 19.99% of the common stock outstanding on the date of the Purchase Agreement), including the 34,762 Commitment Shares, or the Exchange Cap, unless (i) stockholder approval is obtained to issue more, in which case the Exchange Cap will not apply, or (ii) stockholder approval has not been obtained and at any time the Exchange Cap is reached and at all times thereafter the average price paid for all shares issued under the Purchase Agreement (including the

34,762 Commitment Shares) is equal to or greater than a price equal to \$8.63, which is the average of the five closing sale prices of our common stock immediately preceding the execution of the Purchase Agreement; provided that at no time shall Aspire Capital (together with its affiliates) beneficially own more than 19.99% of our common stock. Except for the Initial Purchase, Aspire Capital has no right to require any sales by us, but is obligated to make purchases from us as we direct in accordance with the Purchase Agreement.

S-13

Table of Contents

There are no limitations on use of proceeds, financial or business covenants, restrictions on future fundings, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement. We did not pay any additional amounts to reimburse or otherwise compensate Aspire Capital in connection with the transaction.

Events of Default

Aspire Capital may terminate the Purchase Agreement upon the occurrence of any of the following events of default:

the effectiveness of any registration statement that is required to be maintained effective pursuant to the terms of the registration rights agreement between us and Aspire Capital lapses for any reason (including, without limitation, the issuance of a stop order) or is unavailable for sale of our shares of common stock in accordance with the terms of the registration rights agreement, and such lapse or unavailability continues for a period of ten consecutive business days or for more than an aggregate of thirty business days in any 365-day period, subject to certain exceptions;

the suspension from trading or failure of our common stock to be listed on our principal market for a period of three consecutive business days;

the delisting of our common stock from our principal market, and our common stock is not immediately thereafter trading on the New York Stock Exchange, the NYSE American, the NASDAQ Global Select Market, the NASDAQ Global Market, the NASDAQ Capital Market;

our transfer agent's failure to issue to Aspire Capital shares of our common stock which Aspire Capital is entitled to receive under the Purchase Agreement within five business days after an applicable purchase date;

any breach by us of the representations or warranties or covenants contained in the Purchase Agreement or any related agreements which could have a material adverse effect on us subject to a cure period of five business days;

any person commences a proceeding against us pursuant to or within the meaning of any bankruptcy law;

if we become insolvent or unable to pay our debts as they become due;

any participation or threatened participation in insolvency or bankruptcy proceedings by or against us; or

if the aggregate number of shares of common stock issued to Aspire Capital under the Purchase Agreement exceeds the Exchange Cap, unless and until stockholder approval is obtained or we can otherwise continue to issue shares under the Purchase Agreement without breaching the Company's obligations under the rules

or regulations of the NASDAQ Capital Market or another applicable principal market on which our common stock is then listed or traded.

Our Termination Rights

We may terminate the Purchase Agreement with notice at any time, in our discretion, without any cost or penalty.

No Short-Selling or Hedging by Aspire Capital

Aspire Capital has agreed that neither it nor any of its agents, representatives and affiliates shall engage in any direct or indirect shortselling or hedging of our common stock during any time prior to the termination of the Purchase Agreement.

Effect of Performance of the Purchase Agreement on Our Stockholders

The Purchase Agreement does not limit the ability of Aspire Capital to sell any or all of the shares it currently owns or receives in this offering. It is anticipated that shares sold to Aspire Capital in this offering will be sold to Aspire Capital over a period of up to 30 months from the date of this prospectus supplement, or until August 19, 2021. The

Table of Contents

subsequent resale by Aspire Capital of a significant amount of shares sold to Aspire Capital in this offering at any given time could cause the market price of our common stock to decline or to be highly volatile. Aspire Capital may ultimately purchase all, some or none of the \$20,000,000 of shares of common stock that, together with the 34,762 Commitment Shares, are the subject of this prospectus supplement. Aspire Capital may resell all, some or none of the Commitment Shares and any Purchase Shares it acquires. Therefore, sales to Aspire Capital by us pursuant to the Purchase Agreement and this prospectus also may result in substantial dilution to the interests of other holders of our common stock. However, we have the right to control the timing and amount of any sales of our shares to Aspire Capital and the Purchase Agreement may be terminated by us at any time at our discretion without any cost to us.

Amount of Potential Proceeds to be Received under the Purchase Agreement

Under the Purchase Agreement, we may sell Purchase Shares having an aggregate offering price of up to \$20,000,000 to Aspire Capital from time to time. The number of shares ultimately offered for sale to Aspire Capital in this offering is dependent upon the number of shares we elect to sell to Aspire Capital under the Purchase Agreement. In addition, Aspire Capital will not be required to buy Purchase Shares pursuant to a Purchase Notice that was received by Aspire Capital on any business day on which the last closing trade price of our common stock on the NASDAQ Capital Market (or alternative national exchange in accordance with the Purchase Agreement) is below the Floor Price. The following table sets forth the amount of proceeds we would receive from Aspire Capital from the sale of shares at varying purchase prices:

	Number of Shares to be Sold if Full Purchase	Percentage of Outstanding Shares After Giving Effect to the Sale to Aspire Capital (2)	Proceeds from the Sale of Shares to Aspire Capital Under the Purchase Agreement
Assumed Average Purchase Price	(1)	Capital (2)	Agreement
\$0.50	4,337,611	16.5%	\$ 2,168,805
\$5.00	4,000,000	15.5%	\$ 20,000,000
\$8.67 (3)	2,306,805	9.5%	\$ 19,999,999
\$12.00	1,666,666	7.1%	\$ 19,999,992
\$15.00	1,333,333	5.7%	\$ 19,999,995

(1)

Includes the total number of Purchase Shares (but not Commitment Shares), which we would have sold under the Purchase Agreement at the corresponding assumed purchase price set forth in the adjacent column, up to an aggregate purchase price of \$20,000,000.

- (2) Excludes the Commitment Shares, which represent approximately 0.2% of our outstanding common stock, based on 21,872,803 shares of our common stock outstanding as of February 15, 2019, which does not take into account:

4,969,364 shares of our common stock issuable upon the exercise of stock options outstanding as of February 15, 2019 at a weighted-average exercise price of \$7.71 per share;

1,410,720 shares of our common stock issuable upon the vesting and settlement of restricted stock units outstanding as of February 15, 2019;

2,202,887 shares of our common stock available for future issuance as of February 15, 2019 under our Amended and Restated Equity Incentive Plan;

838,664 shares of our common stock issuable upon the exercise of outstanding warrants as of February 15, 2019 with a weighted average exercise price of \$8.29 per share;

\$40,000,000 of shares of our common stock issuable under a sales agreement with Cowen and Company, LLC, or Cowen, relating to the sale of shares of our common stock in an at-the-market offering program, or the ATM program (4,613,610 shares based on an assumed sale price of \$8.67 per share, the last reported share price of our common stock on the NASDAQ Capital Market on February 15, 2019); and

\$3.0 million of shares of our common stock issuable under 2018 Purchase Agreement relating to the sale of shares of our common stock (346,084 shares based on an assumed sale price of \$8.67 per share, the last reported share price of our common stock on the NASDAQ Capital Market on February 15, 2019).

- (3) On February 15, 2019, the last reported sale price of our common stock was \$8.67 per share.

Table of Contents

Information With Respect to Aspire Capital

Aspire Capital Partners LLC, or Aspire Partners, is the Managing Member of Aspire Capital. SGM Holdings Corp, or SGM, is the Managing Member of Aspire Partners. Mr. Steven G. Martin is the president and sole shareholder of SGM, as well as a principal of Aspire Partners. Mr. Erik J. Brown is the president and sole shareholder of Red Cedar Capital Corp, or Red Cedar, which is a principal of Aspire Partners. Mr. Christos Komissopoulos is president and sole shareholder of Chrisko Investors Inc., or Chrisko, which is a principal of Aspire Partners. Mr. William F. Blank, III is president and sole shareholder of WML Ventures Corp., or WML Ventures, which is a principal of Aspire Partners. Each of Aspire Partners, SGM, Red Cedar, Chrisko, WML Ventures, Mr. Martin, Mr. Brown, Mr. Komissopoulos and Mr. Blank may be deemed to be a beneficial owner of common stock held by Aspire Capital. Each of Aspire Partners, SGM, Red Cedar, Chrisko, WML Ventures, Mr. Martin, Mr. Brown, Mr. Komissopoulos and Mr. Blank disclaims beneficial ownership of the common stock held by Aspire Capital.

S-16

Table of Contents

PLAN OF DISTRIBUTION

In consideration for entering into the Purchase Agreement, we will issue the Commitment Shares to Aspire Capital. The Purchase Agreement provides that, upon the terms and subject to the conditions set forth therein, Aspire Capital is irrevocably committed to purchase up to an aggregate of \$20,000,000 of shares of our common stock over the 30-month term of the Purchase Agreement.

Aspire Capital is an underwriter within the meaning of the Securities Act.

Neither we nor Aspire Capital can presently estimate the amount of compensation that any agent will receive. We know of no existing arrangements between Aspire Capital, any other stockholder, broker, dealer, underwriter, or agent relating to the sale or distribution of the shares offered by this prospectus. At the time a particular offer of shares is made, a prospectus supplement, if required, will be distributed that will set forth the names of any agents, underwriters, or dealers and any other required information.

We will pay all of the expenses incident to the registration, offering, and sale of the shares to Aspire Capital. We have agreed to indemnify Aspire Capital and certain other persons against certain liabilities in connection with the offering of shares of common stock offered hereby, including liabilities arising under the Securities Act or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities. Aspire Capital has agreed to indemnify us against liabilities under the Securities Act that may arise from certain written information furnished to us by Aspire Capital specifically for use in this prospectus or, if such indemnity is unavailable, to contribute amounts required to be paid in respect of such liabilities.

Aspire Capital and its affiliates have agreed not to engage in any direct or indirect short selling or hedging of our common stock during the term of the Purchase Agreement.

We have advised Aspire Capital that it is required to comply with Regulation M promulgated under the Exchange Act. With certain exceptions, Regulation M precludes a selling stockholder, any affiliated purchasers, and any broker-dealer or other person who participates in the distribution from bidding for or purchasing, or attempting to induce any person to bid for or purchase, any security which is the subject of the distribution until the entire distribution is complete. Regulation M also prohibits any bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security. All of the foregoing may affect the marketability of the shares offered hereby this prospectus.

We may suspend the sale of shares to Aspire Capital pursuant to this prospectus for certain periods of time for certain reasons, including if the prospectus is required to be supplemented or amended to include additional material information.

This offering will terminate on the date that all shares offered by this prospectus have been sold to Aspire Capital.

Table of Contents

LEGAL MATTERS

The validity of the common stock being offered in this offering will be passed upon for us by Pepper Hamilton LLP.

EXPERTS

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

S-18

Table of Contents

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

We incorporate by reference into this prospectus supplement and the accompanying prospectus the information or documents listed below that we have filed with the SEC:

our Annual Report on Form 10-K for the year ended December 31, 2018, filed on February 19, 2019 (including the portions of our proxy statement for our 2019 annual meeting of shareholders incorporated by reference therein);

our Current Reports on Form 8-K (other than portions thereof furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits accompanying such reports that are related to such items) filed on January 4, 2019, January 7, 2019, February 14, 2019 and February 19, 2019.

The description of our common stock contained in our registration statement on Form 8-A filed on March 4, 2014 (Registration no. 001-36329) with the SEC, including any amendment or report filed for the purpose of updating such description;

We also incorporate by reference into this prospectus supplement and accompanying prospectus all documents (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) we file under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement until all of the common stock to which this prospectus supplement and the accompanying prospectus relates has been sold or the offering is otherwise terminated. Any statement contained herein or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes hereof to the extent that a statement in any other subsequently filed document which is also incorporated or deemed to be incorporated herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus supplement.

You may request, orally or in writing, a copy of any or all of the documents incorporated herein by reference. These documents will be provided to you at no cost, by contacting: Susan Kim, Argot Partners, 767 Third Avenue, 29th Floor, New York, NY 10017, (212) 600-1902, email address: susan@argotpartners.com. In addition, copies of any or all of the documents incorporated herein by reference may be accessed at our website at <http://www.recropharma.com>. The information on such website is not incorporated by reference and is not a part of this prospectus.

WHERE YOU CAN FIND MORE INFORMATION

We have filed a registration statement on Form S-3 with the SEC for the securities we are offering by this prospectus. This prospectus does not include all of the information contained in the registration statement. You should refer to the registration statement and its exhibits for additional information. You should rely only on the information contained in this prospectus or incorporated by reference herein or therein. We have not authorized anyone else to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front page of this prospectus supplement, regardless of the time of delivery of this prospectus supplement or any sale of the securities offered hereby.

The SEC maintains an Internet website at <http://www.sec.gov> that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. You may access the registration statement, of which this prospectus forms a part, at the SEC's Internet website. Our reports on Forms 10-K, 10-Q and 8-K, and amendments to those reports filed pursuant to Section 13(a) or 15(d) of the Exchange Act, are also available for download, free of charge, as soon as reasonably practicable after these reports are filed with the SEC, at our website at <http://www.recropharma.com>. The content contained in, or that can be accessed through, our website is not a part of this prospectus.

S-19

Table of Contents

PROSPECTUS

\$100,000,000

Common Stock

Preferred Stock

Debt Securities

Warrants

Units

Subscription Rights

We may offer to the public from time to time in one or more series or issuances:

shares of our common stock, par value \$0.01 per share;

shares of preferred stock, par value \$0.01 per share;

warrants to purchase shares of our common stock, preferred stock and/or debt securities;

debt securities consisting of debentures, notes or other evidences of indebtedness;

units consisting of a combination of the foregoing securities;

subscription rights to purchase any of the foregoing securities; or

any combination of these securities.

We may offer and sell up to \$100,000,000 in the aggregate of the securities identified above from time to time in one or more offerings. This prospectus provides a general description of the securities that we may offer. Each time that

we offer securities under this prospectus, we will provide the specific terms of the securities offered, including the public offering price, in a supplement to this prospectus. Any prospectus supplement may add to, update or change information contained in this prospectus. You should read this prospectus and any applicable prospectus supplement together with additional information described under the heading "Where You Can Find More Information" before you make your investment decision.

The securities may be sold by us to or through underwriters or dealers, directly to purchasers or through agents designated from time to time. For additional information on the methods of sale, you should refer to the section entitled "Plan of Distribution" in this prospectus and the comparable section of any applicable prospectus supplement. If any underwriters are involved in the sale of the securities with respect to which this prospectus is being delivered, the names of such underwriters and any applicable discounts or commissions and over-allotment options will be set forth in the applicable prospectus supplement. No securities may be sold without delivery of this prospectus and the applicable prospectus supplement.

Our common stock trades on the NASDAQ Capital Market, or NASDAQ, under the ticker symbol "REPH." On June 1, 2017, the last reported sale price per share of our common stock was \$7.54 per share.

We are an emerging growth company as defined under the federal securities laws and, as such, have elected to comply with certain reduced public company reporting requirements.

INVESTING IN OUR SECURITIES INVOLVES A HIGH DEGREE OF RISK. RISKS ASSOCIATED WITH AN INVESTMENT IN OUR SECURITIES WILL BE DESCRIBED IN THE APPLICABLE PROSPECTUS SUPPLEMENT AND CERTAIN OF OUR FILINGS WITH THE SECURITIES AND EXCHANGE COMMISSION INCORPORATED BY REFERENCE INTO THIS PROSPECTUS, AS DESCRIBED UNDER RISK FACTORS ON PAGE 5.

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

The date of this prospectus is June 12, 2017.

Table of Contents

TABLE OF CONTENTS

	Page
<u>ABOUT THIS PROSPECTUS</u>	ii
<u>FORWARD-LOOKING STATEMENTS</u>	1
<u>THE COMPANY</u>	3
<u>RISK FACTORS</u>	4
<u>USE OF PROCEEDS</u>	4
<u>GENERAL DESCRIPTION OF OUR SECURITIES</u>	5
<u>DESCRIPTION OF OUR CAPITAL STOCK</u>	5
<u>DESCRIPTION OF OUR WARRANTS</u>	8
<u>DESCRIPTION OF OUR DEBT SECURITIES</u>	9
<u>DESCRIPTION OF OUR UNITS</u>	13
<u>DESCRIPTION OF OUR SUBSCRIPTION RIGHTS</u>	14
<u>PLAN OF DISTRIBUTION</u>	15
<u>LEGAL MATTERS</u>	17
<u>EXPERTS</u>	17
<u>INCORPORATION BY REFERENCE</u>	17
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	18

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement that we filed with the Securities and Exchange Commission, or the Commission, using a shelf registration process. Under this shelf registration process, we may offer to sell any of the securities, or any combination of the securities, described in this prospectus, in each case in one or more offerings, up to a total dollar amount of \$100,000,000.

This prospectus provides you only with a general description of the securities that we may offer. Each time securities are sold under the shelf registration statement, we will provide a prospectus supplement or free writing prospectus that will contain specific information about the terms of those securities and the terms of that offering. The prospectus supplement or free writing prospectus may also add, update or change information contained in this prospectus. You should read both this prospectus and any prospectus supplement or free writing prospectus, including all documents incorporated by reference herein and therein, together with the additional information described under Where You Can Find More Information below.

The registration statement that contains this prospectus, including the exhibits to the registration statement and the information incorporated by reference, contains additional information about the securities offered under this prospectus. That registration statement can be read at the SEC website or at the SEC offices mentioned below under the heading Where You Can Find More Information. You should read the exhibits carefully for provisions that may be important to you.

We have not authorized any dealer, agent or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus and any accompanying prospectus supplement or free writing prospectus. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or an accompanying prospectus supplement or free writing prospectus. This prospectus and the accompanying prospectus supplement or free writing prospectus, if any, do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus and the accompanying prospectus supplement or free writing prospectus, if any, constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus and the accompanying prospectus supplement or free writing prospectus, if any, is accurate on any date subsequent to the date set forth on the front of such document or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus and any accompanying prospectus supplement or free writing prospectus is delivered or securities are sold on a later date.

References in this prospectus to the terms the Company, Recro, we, our and us or other similar terms mean Recro Pharma, Inc. and our wholly owned subsidiary, unless we state otherwise or the context indicates otherwise.

Table of Contents

FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain, and any prospectus supplement and the documents incorporated therein may contain, forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this prospectus, any prospectus supplement or the documents incorporated herein and therein by reference 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, plan, predict, would and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

The forward-looking statements in this prospectus and the documents incorporated herein by reference include, among other things, statements about:

our estimates regarding expenses, future revenue, capital requirements and timing and availability of and the need for additional financing;

the results, timing and outcome of our clinical trials of injectable meloxicam or our other product candidates, and any future clinical and preclinical studies;

the preparation and filing of the new drug application for injectable meloxicam, including CMC, and our ability to obtain and maintain regulatory approval of injectable meloxicam and our product candidates, and the labeling under any approval that we may obtain;

our ability to successfully commercialize injectable meloxicam or our other product candidates, upon regulatory approval;

our ability to comply with the legal and regulatory frameworks applicable to our business and other regulatory developments in the United States and foreign countries;

our ability to raise future financing and attain profitability for continued development of our business and our product candidates and to meet required debt payments, and any milestone payments owing to Alkermes plc, or Alkermes, or our other licensing and collaboration partners;

our ability to operate under increased leverage and associated lending covenants;

the performance of third-parties upon which we depend, including third-party contract research organizations and third-party suppliers and manufacturers;

our ability to obtain patent protection and defend our intellectual property rights against third parties;

our ability to maintain our relationships and contracts with our key commercial partners;

our ability to recruit or retain key scientific, technical, commercial, and management personnel or to retain our executive officers;

our ability to comply with stringent U.S. and foreign government regulation in the manufacture of pharmaceutical products, including Good Manufacturing Practice compliance and U.S. Drug Enforcement Agency, or DEA, compliance; and

the effects of changes in our effective tax rate due to changes in the mix of earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets and liabilities and changes in the tax laws.

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 in this prospectus, particularly under Risk

Table of Contents

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, any prospectus supplement and the documents that we incorporate by reference herein and therein 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 update any forward-looking statements.

Table of Contents

THE COMPANY

Overview

We are a specialty pharmaceutical company that operates through two business divisions: an Acute Care division and a revenue-generating contract development and manufacturing, or CDMO division, through which we operate a manufacturing facility in Gainesville, Georgia. We believe that we can bring valuable therapeutic options for patients, prescribers and payors, such as our lead product candidate, injectable meloxicam, and other products, to the hospital and related markets. We believe we can create value for our shareholders through the development, approval and commercialization of our pipeline assets as well as through the ongoing contributions of our cash-flow positive CDMO division. In addition to our pipeline, we are always evaluating acquisition and in-licensing opportunities that can contribute additional revenue and cash flow.

Acute Care

Our Acute Care division is primarily focused on developing innovative products for hospital and related settings. Our lead product candidate is a proprietary injectable form of meloxicam, a long-acting preferential COX-2 inhibitor. Intravenous, or IV, meloxicam has successfully completed two pivotal Phase III clinical trials, a large safety trial and other safety studies for the management of moderate to severe pain. We believe that IV meloxicam compares favorably to competitive therapies in onset of pain relief, duration of pain relief, extent of pain relief and time to peak analgesic effect and that it has been well tolerated. Overall, we enrolled a total of approximately 1,100 patients in our Phase III program, and we anticipate filing a new drug application, or NDA, for IV meloxicam with the U.S. Food and Drug Administration, or FDA, early in the third quarter of 2017. We believe injectable meloxicam, as a non-opioid product, will overcome many of the issues associated with commonly prescribed opioid therapeutics, including respiratory depression and constipation, along with excessive nausea and vomiting, as well having no addiction potential while maintaining analgesic, or pain relieving, effects. We are pursuing a Section 505(b)(2) regulatory strategy for injectable meloxicam.

Our pipeline also includes other early-stage product candidates. Dex-IN, a proprietary intranasal formulation of dexmedetomidine, or Dex, is in a class of drugs called alpha-2 adrenergic agonists. We have studied Dex-IN for the treatment of post-operative pain and, based on clinical trial results and feedback from the FDA, we are exploring Dex-IN for use in treatment of peri-procedural pain. In addition to Dex-IN, we have another selective alpha-2 agonist product candidate in our pipeline, Fadolmidine, or Fado, which we believe also shows promise in neuropathic pain based on preclinical data.

CDMO

Our CDMO division leverages our formulation expertise to develop and manufacture pharmaceutical products using our proprietary delivery technologies for commercial partners who commercialize or plan to commercialize these products. These collaborations result in revenue streams including royalties, profit sharing, research and development and manufacturing, which support continued operations for our CDMO division and have contributed funds to be used in our research and development in our Acute Care division. We operate a 97,000 square foot, DEA-licensed manufacturing facility in Gainesville, Georgia and we currently develop and/or manufacture the following key products with our commercial partners: Ritalin LA[®], Focalin XR[®], Verelan PM[®], generic Verapamil and Zohydro ER[®], as well as development stage products.

Corporate Information

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Our principal executive offices are located at 490 Lapp Road, Malvern, PA 19355, and our telephone number is (484) 395-2470. Our website address is www.recropharma.com. The information contained in, or accessible through, our website does not constitute part of this prospectus. We make available free of charge on our website our annual, quarterly and current reports, including amendments to such reports, as soon as reasonably

Table of Contents

practicable after we electronically file such material with, or furnish such material to, the SEC. Information contained on our website is not incorporated by reference into this prospectus or the accompanying prospectus supplement or free writing prospectus, and you should not consider information contained on our website as part of this prospectus or the accompanying prospectus supplement or free writing prospectus.

Implications of Being an Emerging Growth Company

We are an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. We will remain an emerging growth company until the earliest of (1) the beginning of the first fiscal year following the fifth anniversary of our initial public offering, or January 1, 2020, (2) the beginning of the first fiscal year after our annual gross revenue is \$1.0 billion or more, (3) the date on which we have, during the previous three-year period, issued more than \$1.0 billion in non-convertible debt securities and (4) as of the end of any fiscal year in which the market value of our common stock held by non-affiliates exceeded \$700 million as of the end of the second quarter of that fiscal year.

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

The JOBS Act also provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards, and we have elected to use this extended transition period. This election allows us to delay the adoption of new or revised accounting standards that have different effective dates for public and private companies until those standards apply to private companies. As a result of this election, our financial statements may not be comparable to companies that comply with public company effective dates.

Table of Contents

RISK FACTORS

Our business is influenced by many factors that are difficult to predict, and that involve uncertainties that may materially affect actual operating results, cash flows and financial condition. Before making an investment decision, you should carefully consider these risks, including those set forth in the Risk Factors section of our most recent Annual Report on Form 10-K filed with the SEC, as revised or supplemented by our Quarterly Reports on Form 10-Q filed with the SEC since the filing of our most recent Annual Report on Form 10-K, each of which is incorporated by reference into this prospectus. You should also carefully consider any other information we include or incorporate by reference in this prospectus or include in any applicable prospectus supplement. Each of the risks described in these sections and documents could materially and adversely affect our business, financial condition, results of operations and prospects, and could result in a partial or complete loss of your investment.

USE OF PROCEEDS

Unless otherwise indicated in a prospectus supplement, we anticipate that the net proceeds from our sale of any securities will be used to fund the development of our commercial and clinical programs, for other research and development activities and for general corporate purposes, which may include capital expenditures and funding our working capital needs. We expect from time to time to evaluate the acquisition of businesses, products and technologies for which a portion of the net proceeds may be used, although we currently are not planning or negotiating any such transactions. Pending such uses, we may invest the net proceeds in investment grade interest-bearing securities.

The amounts actually expended for each purpose may vary significantly depending upon numerous factors, including the amount and timing of the proceeds from this offering. Expenditures will also depend upon the establishment of collaborative arrangements with other companies, the availability of additional financing and other factors. Investors will be relying on the judgment of our management regarding the application of the proceeds of any sale of securities.

Table of Contents

GENERAL DESCRIPTION OF OUR SECURITIES

We may offer and sell, at any time and from time to time:

shares of our common stock;

shares of preferred stock;

warrants to purchase shares of our common stock, preferred stock and/or debt securities;

debt securities consisting of debentures, notes or other evidences of indebtedness;

units consisting of a combination of the foregoing securities;

subscription rights to purchase any of the foregoing securities; or

any combination of these securities.

The terms of any securities we offer will be determined at the time of sale. We may issue debt securities that are exchangeable for and/or convertible into common stock or any of the other securities that may be sold under this prospectus. When particular securities are offered by us, a supplement to this prospectus will be filed with the SEC, which will describe the terms of the offering and sale of the offered securities.

DESCRIPTION OF OUR CAPITAL STOCK

The following description of our capital stock and provisions of our articles of incorporation, bylaws and the Pennsylvania Business Corporation law are summaries and are qualified in their entirety by reference to the articles of incorporation and the bylaws. We have filed copies of these documents with the SEC as exhibits to our registration statement, of which this prospectus forms a part.

Pursuant to our Second Amended and Restated Articles of Incorporation, our authorized capital stock consists of 50,000,000 shares of common stock, par value of \$0.01 per share, and 10,000,000 shares of preferred stock, par value \$0.01 per share, to be designated from time to time by our board of directors.

Common Stock

As of June 2, 2017, there were 19,054,566 shares of our common stock issued and outstanding. Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of shareholders, including the election of directors, and do not have cumulative voting rights. Accordingly, the holders of a majority of the outstanding shares of common stock in person or represented by proxies in any election of directors can elect all of the directors standing for election, if they so choose, other than any directors that holders of any preferred stock that we

may issue may be entitled to elect.

Subject to preferences that may be applicable to any then-outstanding shares of preferred stock, holders of our common stock are entitled to receive ratably dividends when, as, and if declared by our board of directors out of funds legally available therefor, subject to any preferential dividend rights of outstanding preferred stock. In the event of our liquidation, dissolution, or winding up, holders of our common stock will be entitled to ratably receive the net assets of our company available after the payments of all debts and other liabilities and subject to the prior rights of the holders of any then-outstanding shares of preferred stock.

Holders of our common stock have no preemptive, subscription, redemption or conversion rights. All outstanding shares of our common stock are, and the common stock to be outstanding upon completion of this offering will be, duly authorized, validly issued, fully paid and non-assessable. The rights and privileges of the holders of the common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Table of Contents

Preferred Stock

Our board of directors has the authority, without further action by our shareholders, to issue up to 10,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the dividend, voting and other rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of our common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in our control and may adversely affect the market price of the common stock and the voting and other rights of the holders of our common stock. We have no current plans to issue any shares of preferred stock.

Common Stock Warrants

We issued to the representatives of the underwriters in our IPO warrants to purchase up to 150,000 shares of our common stock, with a per share exercise price equal to \$12.00, or 150% of the public offering price, or IPO warrants, of which 140,000 are currently outstanding. The IPO warrants are exercisable by the underwriters at any time, in whole or in part, during the four-year period commencing one year after the closing of our IPO.

In connection with our acquisition of IV meloxicam and our CDMO business from Alkermes, we issued to Alkermes a seven-year warrant to purchase an aggregate of 350,000 shares of our common stock, with a per share exercise price of \$19.46 per share. In addition, we issued to OrbiMed Royalty Opportunities, II, LP, or OrbiMed, the lender under our senior secured credit facility, a seven-year warrant to purchase an aggregate of 294,928 shares of our common stock, with a per share exercise price of \$3.28 per share, subject to certain adjustments.

Registration Rights

In July 2015 we completed a private placement to certain investors of 1,379,311 shares of our common stock. In connection with the private placement, we entered into a securities purchase agreement, or Purchase Agreement, with such investors under which we granted the investors certain registration rights with respect to the shares purchased. In particular, the Purchase Agreement required us to file a registration statement with the SEC to register the sale of such shares within 45 days of the consummation of the private placement and to maintain continuous effectiveness of the registration statement. A registration statement relating to such shares was filed on August 20, 2015 and declared effective by the SEC on September 1, 2015.

Anti-Takeover Effects of Pennsylvania Law and Our Articles of Incorporation and Bylaws

Pennsylvania Anti-Takeover Law

Provisions of the Pennsylvania Business Corporation Law of 1988, or the PBCL, applicable to us provide, among other things, that:

we may not engage in a business combination with an interested shareholder, generally defined as a holder of 20% of a corporation's voting stock, during the five-year period after the interested shareholder became

such except under certain specified circumstances;

holders of our common stock may object to a control transaction involving us (a control transaction is defined as the acquisition by a person or group of persons acting in concert of at least 20% of the outstanding voting stock of a corporation), and demand that they be paid a cash payment for the fair value of their shares from the controlling person or group ;

Table of Contents

holders of control shares will not be entitled to voting rights with respect to any shares in excess of specified thresholds, including 20% voting control, until the voting rights associated with such shares are restored by the affirmative vote of a majority of disinterested shares and the outstanding voting shares of the Company; and

any profit, as defined, realized by any person or group who is or was a controlling person or group with respect to us from the disposition of any equity securities of within 18 months after the person or group became a controlling person or group shall belong to and be recoverable by us.

Pennsylvania-chartered corporations may exempt themselves from these and other anti-takeover provisions. Our articles of incorporation do not provide for exemption from the applicability of these or other anti-takeover provisions in the PBCL.

The provisions noted above may have the effect of discouraging a future takeover attempt that is not approved by our board of directors but which individual shareholders may consider to be in their best interests or in which shareholders may receive a substantial premium for their shares over the then current market price. As a result, shareholders who might wish to participate in such a transaction may not have an opportunity to do so. The provisions may make the removal of our board of directors or management more difficult. Furthermore, such provisions could result our company being deemed less attractive to a potential acquiror and/or could result in our shareholders receiving a lesser amount of consideration for their shares of our common stock than otherwise could have been available either in the market generally and/or in a takeover.

Articles of Incorporation and Bylaws

Provisions of our articles of incorporation and bylaws may delay or discourage transactions involving an actual or potential change of control or change in our management, including transactions in which shareholders might otherwise receive a premium for their shares, or transactions that our shareholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect the price of our common stock. Among other things, our articles of incorporation and bylaws:

divide our board of directors into three classes with staggered three-year terms;

provide that a special meeting of shareholders may be called only by a majority of our board of directors;

establish advance notice procedures with respect to shareholder proposals to be brought before a shareholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors;

provide that shareholders may only act at a duly organized meeting; and

provide that members of our board of directors may be removed from office by our shareholders only for cause by the affirmative vote of 75% of the total voting power of all shares entitled to vote generally in the

election of directors.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Broadridge Corporate Issuer Solutions, Inc.

Stock Market Listing

Our shares of common stock are listed for trading on the NASDAQ Capital Market under the symbol REPH.

Table of Contents

DESCRIPTION OF OUR WARRANTS

We may issue warrants to purchase shares of our common stock, preferred stock and/or debt securities in one or more series together with other securities or separately, as described in each applicable prospectus supplement. Below is a description of certain general terms and provisions of the warrants that we may offer. Particular terms of the warrants will be described in the applicable warrant agreements and the applicable prospectus supplement for the warrants.

The applicable prospectus supplement will contain, where applicable, the following terms of and other information relating to the warrants:

the specific designation and aggregate number of, and the price at which we will issue, the warrants;

the currency or currency units in which the offering price, if any, and the exercise price are payable;

the designation, amount and terms of the securities purchasable upon exercise of the warrants;

if applicable, the exercise price for shares of our common stock and the number of shares of common stock to be received upon exercise of the warrants;

if applicable, the exercise price for shares of our preferred stock, the number of shares of preferred stock to be received upon exercise of the warrants, and a description of that series of our preferred stock;

if applicable, the exercise price for our debt securities, the amount of our debt securities to be received upon exercise of the warrants, and a description of that series of debt securities;

the date on which the right to exercise the warrants will begin and the date on which that right will expire or, if the warrants may not be continuously exercised throughout that period, the specific date or dates on which the warrants may be exercised;

whether the warrants will be issued in fully registered form or bearer form, in definitive or global form or in any combination of these forms, although, in any case, the form of a warrant included in a unit will correspond to the form of the unit and of any security included in that unit;

any applicable material U.S. federal income tax consequences;

the identity of the warrant agent for the warrants and of any other depositaries, execution or paying agents, transfer agents, registrars or other agents;

the proposed listing, if any, of the warrants or any securities purchasable upon exercise of the warrants on any securities exchange or market;

if applicable, the date from and after which the warrants and the common stock, preferred stock and/or debt securities will be separately transferable;

if applicable, the minimum or maximum amount of the warrants that may be exercised at any one time;

information with respect to book-entry procedures, if any

the anti-dilution provisions of the warrants, if any;

any redemption or call provisions;

whether the warrants are to be sold separately or with other securities as parts of units; and

any additional terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

Transfer Agent and Registrar

The transfer agent and registrar for any warrants will be set forth in the applicable prospectus supplement.

Table of Contents

Description of Outstanding Warrants

As of June 2, 2017, there were 784,928 warrants to purchase shares of our common stock outstanding. See Description of Our Capital Stock – Common Stock Warrants.

Table of Contents

DESCRIPTION OF OUR DEBT SECURITIES

This section describes the general terms and provisions of the debt securities that we may offer under this prospectus, any of which may be issued as convertible or exchangeable debt securities. We will set forth the particular terms of the debt securities we offer in a prospectus supplement. The extent, if any, to which the following general provisions apply to particular debt securities will be described in the applicable prospectus supplement. The following description of general terms relating to the debt securities and the indenture under which the debt securities will be issued are summaries only and therefore are not complete. You should read the indenture and the prospectus supplement regarding any particular issuance of debt securities.

We will issue any debt under an indenture to be entered into between us and the trustee identified in the applicable prospectus supplement. The terms of the debt securities will include those stated in the indenture and those made part of the indenture by reference to the Trust Indenture Act of 1939, as in effect on the date of the indenture. We have filed or will file a copy of the form of indenture as an exhibit to the registration statement in which this prospectus is included. The indenture will be subject to and governed by the terms of the Trust Indenture Act of 1939.

We may offer under this prospectus up to an aggregate principal amount of \$100,000,000 in debt securities, or if debt securities are issued at a discount, or in a foreign currency, foreign currency units or composite currency, the principal amount as may be sold for an aggregate initial public offering price of up to \$100,000,000. Unless otherwise specified in the applicable prospectus supplement, the debt securities will represent direct, unsecured obligations of the Company and will rank equally with all of our other unsecured indebtedness.

The following statements relating to the debt securities and the indenture are summaries, qualified in their entirety by reference to the detailed provisions of the indenture and the final form indenture as may be filed with a future prospectus supplement.

The prospectus supplement will set forth, to the extent required, the following terms of the debt securities in respect of which the prospectus supplement is delivered:

the title of the series;

the aggregate principal amount;

the issue price or prices, expressed as a percentage of the aggregate principal amount of the debt securities;

any limit on the aggregate principal amount;

the date or dates on which principal is payable;

the interest rate or rates (which may be fixed or variable) or, if applicable, the method used to determine such rate or rates;

the date or dates from which interest, if any, will be payable and any regular record date for the interest payable;

the place or places where principal and, if applicable, premium and interest, is payable;

the terms and conditions upon which we may, or the holders may require us to, redeem or repurchase the debt securities;

the denominations in which such debt securities may be issuable, if other than denominations of \$1,000 or any integral multiple of that number;

whether the debt securities are to be issuable in the form of certificated securities (as described below) or global securities (as described below);

Table of Contents

the portion of principal amount that will be payable upon declaration of acceleration of the maturity date if other than the principal amount of the debt securities;

the currency of denomination;

the designation of the currency, currencies or currency units in which payment of principal and, if applicable, premium and interest, will be made;

if payments of principal and, if applicable, premium or interest, on the debt securities are to be made in one or more currencies or currency units other than the currency of denomination, the manner in which the exchange rate with respect to such payments will be determined;

if amounts of principal and, if applicable, premium and interest may be determined by reference to an index based on a currency or currencies or by reference to a commodity, commodity index, stock exchange index or financial index, then the manner in which such amounts will be determined;

the provisions, if any, relating to any collateral provided for such debt securities;

any addition to or change in the covenants and/or the acceleration provisions described in this prospectus or in the indenture;

any events of default, if not otherwise described below under Defaults and Notice ;

the terms and conditions, if any, for conversion into or exchange for shares of our common stock or preferred stock;

any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents; and

the terms and conditions, if any, upon which the debt securities shall be subordinated in right of payment to other indebtedness of the Company.

We may issue discount debt securities that provide for an amount less than the stated principal amount to be due and payable upon acceleration of the maturity of such debt securities in accordance with the terms of the indenture. We may also issue debt securities in bearer form, with or without coupons. If we issue discount debt securities or debt securities in bearer form, we will describe material U.S. federal income tax considerations and other material special considerations which apply to these debt securities in the applicable prospectus supplement. We may issue debt securities denominated in or payable in a foreign currency or currencies or a foreign currency unit or units. If we do, we will describe the restrictions, elections, and general tax considerations relating to the debt securities and the foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

Exchange and/or Conversion Rights

We may issue debt securities which can be exchanged for or converted into shares of our common stock or preferred stock. If we do, we will describe the terms of exchange or conversion in the prospectus supplement relating to these debt securities.

Transfer and Exchange

We may issue debt securities that will be represented by either:

book-entry securities, which means that there will be one or more global securities registered in the name of a depositary or a nominee of a depositary; or

certificated securities, which means that they will be represented by a certificate issued in definitive registered form.

We will specify in the prospectus supplement applicable to a particular offering whether the debt securities offered will be book-entry or certificated securities.

Table of Contents

Certificated Debt Securities

If you hold certificated debt securities issued under an indenture, you may transfer or exchange such debt securities in accordance with the terms of the indenture. You will not be charged a service charge for any transfer or exchange of certificated debt securities but may be required to pay an amount sufficient to cover any tax or other governmental charge payable in connection with such transfer or exchange.

Global Securities

The debt securities of a series may be issued in the form of one or more global securities that will be deposited with a depositary or its nominees identified in the prospectus supplement relating to the debt securities. In such a case, one or more global securities will be issued in a denomination or aggregate denominations equal to the portion of the aggregate principal amount of outstanding debt securities of the series to be represented by such global security or securities.

Unless and until it is exchanged in whole or in part for debt securities in definitive registered form, a global security may not be registered for transfer or exchange except as a whole by the depositary for such global security to a nominee of the depositary and except in the circumstances described in the prospectus supplement relating to the debt securities. The specific terms of the depositary arrangement with respect to a series of debt securities will be described in the prospectus supplement relating to such series.

Protection in the Event of Change of Control

Any provision in an indenture that governs our debt securities covered by this prospectus that includes any covenant or other provision providing for a put or increased interest or otherwise that would afford holders of our debt securities additional protection in the event of a recapitalization transaction, a change of control of the Company, or a highly leveraged transaction will be described in the applicable prospectus supplement.

Covenants

Unless otherwise indicated in this prospectus or the applicable prospectus supplement, our debt securities may not have the benefit of any covenant that limits or restricts our business or operations, the pledging of our assets or the incurrence by us of indebtedness. We will describe in the applicable prospectus supplement any material covenants in respect of a series of debt securities.

Consolidation, Merger and Sale of Assets

We may agree in any indenture that governs the debt securities of any series covered by this prospectus that we will not consolidate with or merge into any other person or convey, transfer, sell or lease our properties and assets substantially as an entirety to any person, unless such person and such proposed transaction meets various criteria, which we will describe in detail in the applicable prospectus supplement.

Defaults and Notice

The debt securities of any series will contain events of default to be specified in the applicable prospectus supplement, which may include, without limitation:

failure to pay the principal of, or premium or make-whole amount, if any, on any debt security of such series when due and payable (whether at maturity, by call for redemption, through any mandatory sinking fund, by redemption at the option of the holder, by declaration or acceleration or otherwise);

failure to make a payment of any interest on any debt security of such series when due;

our failure to perform or observe any other covenants or agreements in the indenture with respect to the debt securities of such series;

Table of Contents

certain events relating to our bankruptcy, insolvency or reorganization; and

certain cross defaults, if and as applicable.

If an event of default with respect to debt securities of any series shall occur and be continuing, we may agree that the trustee or the holders of at least 25% in aggregate principal amount of the then outstanding debt securities of such series may declare the principal amount (or, if the debt securities of such series are issued at an original issue discount, such portion of the principal amount as may be specified in the terms of the debt securities of such series) of all debt securities of such series or such other amount or amounts as the debt securities or supplemental indenture with respect to such series may provide, to be due and payable immediately. Any provisions pertaining to events of default and any remedies associated therewith will be described in the applicable prospectus supplement.

Any indenture that governs our debt securities covered by this prospectus may require that the trustee under such indenture shall, within 90 days after the occurrence of a default, give to holders of debt securities of any series notice of all uncured defaults with respect to such series known to it. However, in the case of a default that results from the failure to make any payment of the principal of, premium or make-whole amount, if any, or interest on the debt securities of any series, or in the payment of any mandatory sinking fund installment with respect to debt securities of such series, if any, the trustee may withhold such notice if it in good faith determines that the withholding of such notice is in the interest of the holders of debt securities of such series. Any terms and provisions relating to the foregoing types of provisions will be described in further detail in the applicable prospectus supplement.

Any indenture that governs our debt securities covered by this prospectus will contain a provision entitling the trustee to be indemnified by holders of debt securities before proceeding to exercise any trust or power under the indenture at the request of such holders. Any such indenture may provide that the holders of at least a majority in aggregate principal amount of the then outstanding debt securities of any series may direct the time, method and place of conducting any proceedings for any remedy available to the trustee, or of exercising any trust or power conferred upon the trustee with respect to the debt securities of such series. However, the trustee under any such indenture may decline to follow any such direction that conflicts with law or the indenture, or that the trustee determines may be unduly prejudicial to the holders of the debt securities of such series not joining in such direction.

Any indenture that governs our debt securities covered by this prospectus may endow the holders of such debt securities to institute a proceeding with respect to such indenture, subject to certain conditions, which will be specified in the applicable prospectus supplement and which may include, that the holders of at least a majority in aggregate principal amount of the debt securities of such series then outstanding make a written request upon the trustee to exercise its power under the indenture, indemnify the trustee and afford the trustee reasonable opportunity to act. Even so, such holders may have an absolute right to receipt of the principal of, premium or make-whole amount, if any, and interest when due, on, the debt securities to require conversion or exchange of debt securities if such indenture provides for convertibility or exchangeability at the option of the holder and to institute suit for the enforcement of such rights. Any terms and provisions relating to the foregoing types of provisions will be described in further detail in the applicable prospectus supplement.

Modification of the Indenture

We and the trustee may modify any indenture that governs our debt securities of any series covered by this prospectus with or without the consent of the holders of such debt securities, under certain circumstances to be described in a prospectus supplement.

Table of Contents

Defeasance; Satisfaction and Discharge

The prospectus supplement will outline the conditions under which we may elect to have certain of our obligations under the indenture discharged and under which the indenture obligations will be deemed to be satisfied.

Regarding the Trustee

We will identify the trustee and any relationship that we may have with such trustee, with respect to any series of debt securities, in the prospectus supplement relating to the applicable debt securities. You should note that if the trustee becomes a creditor of Recro Pharma, Inc., the indenture and the Trust Indenture Act of 1939 limit the rights of the trustee to obtain payment of claims in certain cases, or to realize on certain property received in respect of any such claim, as security or otherwise. The trustee and its affiliates may engage in, and will be permitted to continue to engage in, other transactions with us and our affiliates. If, however, the trustee acquires any conflicting interest within the meaning of the Trust Indenture Act of 1939, it must eliminate such conflict or resign.

Governing Law

The law governing the indenture and the debt securities will be identified in the prospectus supplement relating to the applicable indenture and debt securities.

Table of Contents

DESCRIPTION OF OUR UNITS

The following, together with the additional information we may include in the applicable prospectus supplement, summarizes the material terms and provisions of the units that we may offer under this prospectus. While the terms summarized below will apply generally to any units we may offer, we will describe the particular terms of any series of units in more detail in the applicable prospectus supplement.

We may, from time to time, issue units comprised of one or more of the other securities that may be offered under this prospectus, in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately at any time, or at any time before a specified date.

We will describe in the applicable prospectus supplement the terms of the series of units, including:

the material terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;

the rights and obligations of the unit agent, if any;

any material provisions relating to the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units; and

any material provisions of the governing unit agreement that differ from those described above.

Issuance in Series

We may issue units in such amounts and in numerous distinct series as we determine.

DESCRIPTION OF OUR SUBSCRIPTION RIGHTS

As specified in any applicable prospectus supplement, we may issue subscription rights consisting of one or more debt securities, shares of preferred stock, shares of common stock or any combination of such securities.

Table of Contents

PLAN OF DISTRIBUTION

We may sell the securities being offered by this prospectus separately or together:

directly to purchasers;

through agents;

to or through underwriters;

through dealers;

through a block trade in which the broker or dealer engaged to handle the block trade will attempt to sell the securities as agent, but may position and resell a portion of the block as principal to facilitate the transaction; or

through a combination of any of these methods of sale.

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

We may effect the distribution of the securities from time to time in one or more transactions:

at a fixed price, or prices, which may be changed from time to time;

at market prices prevailing at the time of sale;

at prices related to such prevailing market prices; or

at negotiated prices.

For example, we may engage in at-the-market offerings into an existing trading market in accordance with Rule 415(a)(4) under the Securities Act. We may also sell securities through a rights offering, forward contracts or similar arrangements. In any distribution of subscription rights to shareholders, if all of the underlying securities are not subscribed for, we may then sell the unsubscribed securities directly to third parties or may engage the services of one or more underwriters, dealers or agents, including standby underwriters, to sell the unsubscribed securities to third

parties.

The securities issued and sold under this prospectus will have no established trading market, other than our common stock, which is listed on NASDAQ. Any shares of our common stock sold pursuant to this prospectus will be eligible for listing and trading on the NASDAQ, subject to official notice of issuance. Any underwriters to whom securities are sold by us for public offering and sale may make a market in the securities, but the underwriters will not be obligated to do so and may discontinue any market making at any time without notice. The securities, other than our common stock, may or may not be listed on a national securities exchange or other trading market.

We will set forth in a prospectus supplement:

the terms of any underwriting or other agreement that we reach relating to sales under this prospectus;;

the method of distribution of the securities;

the names of any agents, underwriters or dealers, including any managing underwriters, used in the offering of securities;

the terms of any direct sales, including the terms of any bidding or auction process, or the terms of any other transactions;

Table of Contents

the compensation payable to agents, underwriters and dealers, which may be in the form of discounts, concessions or commissions;

any activities that may be undertaken by agents, underwriters and dealers to stabilize, maintain or otherwise affect the price of the securities; and

any indemnification and contribution obligations owing to agents, underwriters and dealers.

If we sell directly to institutional investors or others, they may be deemed to be underwriters within the meaning of the Securities Act with respect to any resale of the securities. Unless otherwise indicated in a prospectus supplement, if we sell through an agent, such agent will be acting on a best efforts basis for the period of its appointment. Any agent may be deemed to be an underwriter of the securities as that term is defined in the Securities Act. If a dealer is used in the sale of the securities, we or an underwriter will sell securities to the dealer, as principal. The dealer may resell the securities to the public at varying prices to be determined by the dealer at the time of resale.

We may authorize agents, underwriters and dealers to solicit offers by certain institutional investors to purchase offered securities under contracts providing for payment and delivery on a future date specified in a prospectus supplement. The prospectus supplement will also describe the public offering price for the securities and the commission payable for solicitation of these delayed delivery contracts. Delayed delivery contracts will contain definite fixed price and quantity terms. The obligations of a purchase under these delayed delivery contracts will be subject to only two conditions:

that the institution's purchase of the securities at the time of delivery of the securities is not prohibited under the law of any jurisdiction to which the institution is subject; and

that we shall have sold to the underwriters the total principal amount of the offered securities, less the principal amount covered by the delayed contracts.

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

To the extent permitted by and in accordance with Regulation M under the Exchange Act, any underwriters who are qualified market makers on NASDAQ may engage in passive market making transactions in the securities on NASDAQ during the business day prior to the pricing of an offering, before the commencement of offers or sales of the securities. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security; if all independent bids are lowered below the passive market maker's

bid, however, the passive market maker's bid must then be lowered when certain purchase limits are exceeded.

The specific terms of any lock-up provisions in respect of any given offering will be described in the applicable prospectus supplement.

In compliance with the guidelines of the Financial Industry Regulatory Authority, Inc., or FINRA, the maximum consideration or discount to be received by any FINRA member or independent broker-dealer may not exceed 8% of the aggregate proceeds of the offering.

Table of Contents

The underwriters, dealers and agents may engage in transactions with us, or perform services for us, in the ordinary course of business for which they receive compensation.

No securities may be sold under this prospectus without delivery, in paper format or in electronic format, or both, of the applicable prospectus supplement describing the method and terms of the offering.

Table of Contents

LEGAL MATTERS

The validity of the issuance of the securities offered hereby will be passed upon for us by Hogan Lovells US LLP, Philadelphia, Pennsylvania. As appropriate, legal counsel representing the underwriters, dealers or agents will be named in the accompanying prospectus supplement and may opine to certain legal matters.

EXPERTS

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

The audited combined historical financial statements of DARA included on page 6 of Recro Pharma, Inc.'s Current Report on Form 8-K/A dated June 2, 2015 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, independent accountants, given on the authority of said firm as experts in auditing and accounting.

INCORPORATION 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.

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:

our Annual Report on Form 10-K for the year ended December 31, 2016, filed on March 9, 2017 (including the portions of our proxy statement for our 2017 annual meeting of shareholders incorporated by reference therein);

our Quarterly Report on Form 10-Q for the period ended March 31, 2017, filed on May 11, 2017;

our Current Reports on Form 8-K (other than portions thereof furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits accompanying such reports that are related to such items) filed on January 6, 2017; February 27, 2017; March 6, 2017; March 7, 2017; April 5, 2017; May 9, 2017; and May 18, 2017;

The description of our common stock contained in our registration statement on Form 8-A filed on March 4, 2014 (Registration no. 001-36329) with the SEC, including any amendment or report filed for the purpose of updating such description;

In addition, all documents that we file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of the initial registration statement of which this prospectus is a part and prior to the effectiveness of

such registration statement and all such documents that we file with the SEC after the date of this prospectus and before the termination of the offering of our securities shall be deemed incorporated by reference into this prospectus and to be a part of this prospectus from the respective dates of filing such documents.

The audited combined financial statements of DARA for the year ended December 31, 2014 and the nine months ended December 31, 2013, the historical unaudited financial statements of DARA as of March 31, 2015 and for the three months ended March 31, 2015 and 2014, and the unaudited pro forma condensed combined statement of

Table of Contents

operations of the Company and DARA for the year ended December 31, 2015 are incorporated herein by reference to exhibits 99.1, 99.2 and 99.3, respectively, to the registration statement of which this prospectus forms a part.

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

You may request, orally or in writing, a copy of any or all of the documents incorporated herein by reference. These documents will be provided to you at no cost, by contacting: Susan Kim, Argot Partners, 767 Third Avenue, 29th Floor, New York, NY 10017, (212) 600-1902, email address: susan@argotpartners.com. In addition, copies of any or all of the documents incorporated herein by reference may be accessed at our website at <http://www.recropharma.com>. The information on such website is not incorporated by reference and is not a part of this prospectus.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any document we file with the SEC at the SEC's public reference room at 100 F Street NE, Room 1580, Washington, D.C. 20549. You may obtain information on the operation of the SEC's public reference facilities by calling the SEC at 1-800-SEC-0330. You can request copies of these documents, upon payment of a duplicating fee, by writing to the SEC at its principal office at 100 F Street NE, Room 1580, Washington, D.C. 20549-1004. The SEC maintains an Internet website at <http://www.sec.gov> that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. Our SEC filings are accessible through the Internet at that website. Our reports on Forms 10-K, 10-Q and 8-K, and amendments to those reports, are also available for download, free of charge, as soon as reasonably practicable after these reports are filed with the SEC, at our website at www.recropharma.com. The content contained in, or that can be accessed through, our website is not a part of this prospectus.

Table of Contents

**\$20,000,000 OF COMMON STOCK
PLUS 34,762 COMMITMENT SHARES**

PROSPECTUS SUPPLEMENT

February 19, 2019