

Kindred Biosciences, Inc.
Form 424B5
January 17, 2019
Filed Pursuant to Rule 424(b)(5)
Registration No. 333-222597

The information in this preliminary prospectus supplement and the accompanying prospectus, relating to an effective registration statement under the Securities Act of 1933, as amended, is not complete and may be changed. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities and we are not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated January 17, 2019

PRELIMINARY PROSPECTUS SUPPLEMENT
(To Prospectus dated February 7, 2018)

Shares
KINDRED BIOSCIENCES, INC.
Common Stock

We are offering shares of our common stock. Our common stock is listed on The Nasdaq Capital Market under the symbol "KIN." On January 16, 2019, the last reported sale price of our common stock was \$11.03 per share. Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page S-9 of this prospectus supplement, on page 4 of the accompanying prospectus and in the documents incorporated by reference into this prospectus supplement and the accompanying prospectus.

| | Per Share | Total |
|---|-----------|-------|
| Public offering price | \$ | \$ |
| Underwriting discounts and commissions ⁽¹⁾ | \$ | \$ |
| Proceeds to us before expenses | \$ | \$ |

(1) We have agreed to reimburse the underwriters for certain expenses. See "Underwriting."

We have granted the underwriters an option for a period of 30 days from the date of this prospectus supplement to purchase up to an additional shares of our common stock on the same terms and conditions set forth above. If the underwriters exercise their option in full, the total underwriting discounts and commissions payable by us will be \$, and the total proceeds to us, before expenses, will be \$.

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

The underwriters expect to deliver the shares on or about , 2019.

Barclays Stifel

Prospectus supplement dated , 2019.

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus relate to the offering of our common stock. Each share of common stock offered by this prospectus supplement and the accompanying prospectus is accompanied by one Series A preferred stock purchase right that trades with our common stock. Before purchasing any of the common stock that we are offering, you should carefully read this prospectus supplement and the accompanying prospectus, together with the information incorporated by reference into this prospectus supplement and the accompanying prospectus as described under the headings “Where You Can Find More Information” and “Incorporation of Certain Information by Reference” on page S-22. These documents contain important information that you should consider when making your investment decision.

This prospectus supplement and the accompanying prospectus form part of a registration statement on Form S-3 that we filed with the SEC using 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 into this prospectus supplement or the accompanying prospectus, 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. If any statement in this prospectus supplement or the accompanying prospectus is inconsistent with a statement in another document having a later date, for example, a document incorporated by reference into this prospectus supplement, the statement in the document having the later date will be deemed to modify or supersede the earlier statement.

Unless the context otherwise requires, the terms “KindredBio,” “the Company,” “our company,” “we,” “us,” and “our” refer to Kindred Biosciences, Inc., a Delaware corporation, including, where appropriate, our wholly owned subsidiary, KindredBio Equine, Inc. When we refer to “you,” we mean the purchaser or potential purchaser of the shares of common stock offered by this prospectus supplement and the accompanying prospectus.

You should rely only on the information contained in or incorporated by reference into this prospectus supplement, the accompanying prospectus and any free writing prospectus that we may authorize for use in connection with this offering. We have not, and the underwriter has not, authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. Neither we nor the underwriter is offering to sell, or seeking offers to buy, our common stock in any jurisdiction where the offer or sale is not permitted. The distribution of this prospectus supplement and the offering of our common stock in certain jurisdictions may be restricted by law. Persons outside the United States who come into possession of this prospectus supplement must inform themselves about, and observe any restrictions relating to, the offering of our common stock and the distribution of this prospectus supplement outside the United States. This prospectus supplement does not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any common stock offered by this prospectus supplement by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus and any free writing prospectus that we may authorize for use in connection with this offering is accurate only as of the date of those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus contain summaries of certain provisions contained in some of the documents described herein and therein, 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 such documents have been or will be filed as exhibits to the registration statement of which this prospectus supplement and the accompanying prospectus are a part or as exhibits to documents incorporated by reference herein or therein, and you may obtain copies of those documents as described below under the headings “Where You Can Find More Information” and “Incorporation of Certain Information by Reference” on page S-22. We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is 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 the agreement, and should not be deemed to be a representation, warranty or covenant to you.

Unless otherwise indicated, information contained in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus and any free writing prospectus that we may authorize for use in connection with this offering concerning our industry and the markets in which we operate, including our general expectations and market opportunity, is based on information from our own management estimates and research, as well as from industry and general publications and research, surveys and studies conducted by third parties. Management estimates are derived from publicly available information, our knowledge of our industry and assumptions based on such information and knowledge. We believe such estimates to be reasonable, but we have not independently verified the accuracy of information obtained from third parties. In addition, assumptions and estimates of our and our industry’s future performance are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in “Risk Factors” in this prospectus supplement on page S-9, in the accompanying prospectus and in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 which is incorporated by reference into this prospectus supplement and the accompanying prospectus. These and other important factors could cause our future performance to differ materially from our assumptions and estimates. See “Special Note Regarding Forward-Looking Statements” below.

Kindred Biosciences, Kindred Bio and “Best Medicines for Our Best Friends” are three of our trademarks that are used in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference into this prospectus and the accompanying prospectus. This prospectus supplement, the accompanying prospectus and the documents incorporated by reference also include trademarks, tradenames and service marks that are the property of other organizations. Solely for convenience, trademarks and tradenames referred to in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference sometimes appear without the ® and ™ symbols, 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 trademarks and tradenames.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus and any free writing prospectus that we may authorize for use in connection with this offering contain forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act. All statements, other than statements of historical fact, that address activities, events or developments that we believe or anticipate will or may occur in the future are forward-looking statements, including, statements about our plans, objectives, strategies and prospects regarding, among other things, our financial condition, operating results and business.

We have identified some of these forward-looking statements with words such as “believe,” “may,” “will,” “should,” “could,” “expect,” “intend,” “plan,” “predict,” “anticipate,” “estimate,” “continue” or other words and terms of similar meaning and the future dates. These forward-looking statements are based on current expectations about future events affecting us and are subject to uncertainties and factors relating to our operations and business environment, all of which are difficult to predict and many of which are beyond our control and could cause our actual results to differ materially from those matters expressed or implied by our forward-looking statements. Forward-looking statements are only predictions or statements of current plans and can be affected by inaccurate assumptions we might make or by known or unknown risks and uncertainties, including the risks

described under the “Risk Factors” sections that are contained in this prospectus supplement on page S-9, in the accompanying prospectus and in our filings with the SEC that are incorporated by reference into this prospectus supplement and the accompanying prospectus, including, without limitation, the “Risk Factors” sections of our most recently filed Annual Report on Form 10-K and Quarterly Report on Form 10-Q. Such risks and uncertainties are not exclusive and further information concerning us and our business, including factors that potentially could materially affect our financial results or condition, may emerge from time to time.

These risks and uncertainties include, but are not limited to, the following:

- our limited operating history and expectations of losses for the foreseeable future;
- the absence of significant revenue from our product candidates for the foreseeable future;
- our potential inability to obtain any necessary additional financing;
- our substantial dependence on the success of our lead product candidates, which may not be successfully commercialized even if they are approved for marketing;
- the effect of competition;
- our potential inability to obtain regulatory approval for our existing or future product candidates;
- our dependence on third parties to conduct some of our development activities;
- our dependence upon third-party manufacturers for supplies of our product candidates;
- uncertainties regarding the outcomes of trials pertaining to our product candidates;
- our potential failure to attract and retain senior management and key scientific personnel;
- uncertainty about our ability to develop a satisfactory sales organization;
- our significant costs of operating as a public company;
- our potential inability to obtain patent protection and other intellectual property protection for our product candidates;
- potential claims by third parties alleging our infringement of their patents and other intellectual property rights;
- our potential failure to comply with regulatory requirements, which are subject to change on an ongoing basis;
- the potential volatility of our stock price; and
- the significant control over our business by our principal stockholders and management.

Each forward-looking statement is based on information available to us as of the date of the document in which the forward-looking statement is contained. We undertake no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise, except as otherwise required by law.

All forward-looking statements that are made by us in this prospectus supplement, in the accompanying prospectus, in the documents incorporated by reference into this prospectus supplement and the accompanying prospectus and in any free writing prospectus that we may authorize for use in connection with this offering are qualified by these cautionary statements.

PROSPECTUS SUPPLEMENT SUMMARY

The following summary highlights selected information about us, this offering and information contained elsewhere in or incorporated by reference into this prospectus supplement or the accompanying prospectus. This summary does not contain all of the information that may be important to you. Before purchasing any of the common stock that we are offering, you should carefully read in their entirety this prospectus supplement and the accompanying prospectus, including the documents incorporated by reference into this prospectus supplement and the accompanying prospectus, and any free writing prospectus that we may authorize for use in this offering. In particular, you should carefully review the “Risk Factors” sections that are contained in this prospectus supplement on page S-9, in the accompanying prospectus and in our filings with the SEC that are incorporated by reference into this prospectus supplement and the accompanying prospectus, including, without limitation, the “Risk Factors” sections of our most recently filed Annual Report on Form 10-K and Quarterly Report on Form 10-Q.

Our Company

We are a commercial-stage biopharmaceutical company focused on saving and improving the lives of pets. Our mission is to bring to our pets the same kinds of safe and effective medicines that our human family members enjoy. Our core strategy is to identify compounds and targets that have already demonstrated safety and efficacy in humans and to develop therapeutics based on these validated compounds and targets for pets, primarily dogs, cats and horses. We believe that this approach will lead to shorter development times and higher approval rates than pursuing new, non-validated compounds and targets. Our current portfolio includes over 20 product candidates in development consisting of both small molecules and biologics.

Mirataz[®] (mirtazapine transdermal ointment), our transdermal drug for the management of unintended weight loss in cats, was approved by the Food and Drug Administration (the “FDA”) in May 2018. The product became commercially available to U.S. veterinarians on July 9, 2018. Approximately 33% of veterinary clinics in the United States purchased Mirataz in the second half of 2018, with approximately 56% of veterinary clinics placing re-orders in that period.

We recorded net product revenues of \$0.6 million in the quarter ended September 30, 2018. Based on our unaudited internal financial statements, we expect to record approximately \$2.0 million in net product revenues for the year ended December 31, 2018, and based on information currently available, further estimate that, as of December 31, 2018, our unaudited cash, cash equivalents and investment in marketable securities balances were approximately \$73.9 million. These preliminary estimates have been prepared by, and are the responsibility of, our management. Our independent registered public accounting firm has not audited or reviewed, and does not express an opinion with respect to, these estimates. Actual results and financial data as of December 31, 2018 may differ from the above estimates due to the completion of our closing procedures with respect to the fiscal year ended December 31, 2018, final adjustments and other developments that may arise between now and the time the financial results for the fiscal year are finalized. We expect to complete our closing procedures with respect to the fiscal year ended December 31, 2018 after this offering is consummated. Accordingly, our financial statements as of and for the fiscal year ended December 31, 2018 will not be available until after this offering is completed.

On December 21, 2017, the European Medicines Agency (the “EMA”) accepted our Mirataz submission for review, and we are currently responding to the EMA’s questions. We expect that Mirataz will be approved by the EMA in 2019. Regulatory approval is subject to the typical risks inherent in such a process.

Mirataz is the first and only transdermal medication specifically developed, and FDA-approved, for the management of weight loss in cats. Weight loss in cats is a serious and potentially fatal condition that represents a leading cause of visits to the veterinarian for cats. Our research estimates that as many as 9,000,000 cats each year are diagnosed with unintended weight loss caused by varying underlying conditions, such as chronic kidney disease, cancer or diabetes, with approximately 3,000,000 cats being treated for unintended weight loss each year. Mirataz, which is formulated with our proprietary Accusorb[™] technology, is applied topically to the cat’s inner ear (pinna)

once a day, providing a more attractive application route compared to oral administration. 74% of veterinarians report that ease of administering medication is a primary factor in selecting medication for feline weight loss. The product is classified as a weight gain drug and can be used in cats with various underlying diseases associated with unintended weight loss.

On October 30, 2018, we reported positive topline results from our pilot effectiveness study of KIND-016, a fully caninized, high-affinity monoclonal antibody targeting interleukin-31 (“IL-31”), for the treatment of atopic dermatitis in dogs. The study was a randomized, blinded, placebo-controlled, pilot laboratory study that enrolled 32 dogs to assess the effectiveness of KIND-016 at three doses. A single dose of KIND-016 was administered on day 0 and itching was induced at weeks 1, 2, 3, 4, 6, and 8 with an injection of canine IL-31. Our IL-31 antibody resulted in statistically significant reductions in pruritus ($p < 0.0001$ to $p < 0.05$) across all dose groups and was sustained for 6 to 8 weeks, with a clear dose response. The reduction in the itching score was as high as 86.1%. Based on a preliminary review of the safety data, the drug appears to be well tolerated. In addition, we announced that the U.S. Patent and Trademark Office has issued a patent (Patent No. 10,093,731) for our anti-IL31 antibody.

We are also currently conducting a pilot field effectiveness study for our IL-31 antibody. We are in the process of initiating pilot effectiveness studies for several other molecules for atopic dermatitis, including a caninized anti-IL17 antibody and canine anti-IL4/IL13 SINK molecule. Atopic dermatitis is an immune-mediated inflammatory skin condition in dogs. An estimated 10-15% of dogs have this condition. It is the leading reason owners take their dog to the veterinarian, and the current market size is over \$500 million annually and growing rapidly. We are pursuing a multi-pronged approach toward atopic dermatitis, with a portfolio of promising biologics.

On January 14, 2019, we reported positive topline results from the pilot field effectiveness study of our enhanced version of epoCat[™] (long-acting feline recombinant erythropoietin) for the treatment of anemia in cats. In the study, which enrolled 23 cats with anemia secondary to chronic kidney disease, epoCat rapidly increased mean hematocrit, with statistically significant improvement as early as Week 1 ($p < 0.0001$). The effect was sustained, with continued statistically significant improvement at Weeks 2, 3, 4, 5, and 6 ($p < 0.0001$ at each visit). Compared to baseline, the mean of peak percent improvement in hematocrit by Week 6 was 55.4%.

In addition, 95.5% of the 22 evaluable patients achieved treatment success over the 6-week treatment period, defined prospectively as either a 30% increase in hematocrit value over baseline or the hematocrit value reaching normal range. Furthermore, epoCat resulted in statistically significant improvements over baseline ($p < 0.01$ to $p < 0.05$) across all three health-related quality of life (QoL) domains, namely Vitality, Comfort, and Emotional Wellbeing, as measured by a validated QoL instrument. Based on a preliminary review of the safety data, the drug appears to be well tolerated. We plan to commence a pivotal study this year and are currently in discussions with the FDA regarding study design. The FDA has agreed to accept hematocrit as the primary endpoint for the pivotal study.

epoCat is a recombinant feline erythropoietin that has been engineered by us to have a prolonged half-life, intended to be administered once-monthly. Erythropoietin is an endogenous protein that regulates and stimulates production of red blood cells.

Anemia is a common condition that is estimated to afflict millions of older cats. It is often associated with chronic kidney disease, because kidneys produce erythropoietin and chronic kidney disease leads to decreased levels of endogenous erythropoietin. Chronic kidney disease affects approximately half of older cats, making it a leading cause of feline mortality. Human erythropoietin, which is a multi-billion dollar product in humans, is immunogenic in cats.

Zimeta is designed as an IV and Oral drug intended for the control of pyrexia (fever) in horses. There are eight to nine million horses in the United States and approximately 690,000 are treated for fever annually. Based on recent research, 95% of veterinarians believe that Zimeta would be a good fit for their practice and 83% would use Zimeta in the first year.

The FDA has approved the safety and effectiveness technical sections for Zimeta™(dipyrone injection) for the control of pyrexia (fever) in horses. The FDA has indicated it does not have any additional questions or requests

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from us regarding the Chemistry, Manufacturing and Controls (“CMC”) technical section. The pre-approval inspection at the contract manufacturer of Zimeta IV took place in July 2018, and was successful. The responses to the findings identified during an inspection in April 2018 at the contract manufacturer of the active pharmaceutical ingredient (“API”) dipyron were submitted to the FDA, and the FDA indicated it would conduct a reinspection of the API manufacturer.

The pivotal field effectiveness study for Zimeta™(dipyron oral gel) (Zimeta Oral) has been completed with positive results. The target animal safety study is also complete, and Zimeta Oral was found to be well-tolerated. We have transferred the product to the commercial manufacturer and are in discussions with the FDA and EMA regarding the data required to show bioequivalence to the previously manufactured product. Zimeta Oral, which is a proprietary oral gel, is expected to expand use of the drug and build upon the success of Zimeta IV.

The pilot field effectiveness study of KIND-014 for the treatment of gastric ulcers in horses has been completed with positive results. We have selected a formulation for development and anticipate moving into a pivotal field study later in 2019. Equine gastric ulcer syndrome (“EGUS”) is a common condition in horses that encompasses primary and secondary erosive and ulcerative diseases of both the squamous and glandular parts of the stomach. It affects approximately half of all horses. Various clinical signs are associated with EGUS, including poor appetite, poor condition, colic, and behavioral issues.

The pilot field effectiveness study of our anti-TNF monoclonal antibody targeting sick or septic foals has been completed with positive results. We are now in discussions with the FDA regarding the pivotal study design. Sepsis in foals can cause up to 50% mortality and is an important unmet medical need. There is currently no FDA-approved therapy. We have optimized an equine anti-TNF monoclonal antibody and intend to continue field studies during the 2020 foaling season, following discussion with the FDA regarding the development plan.

We have initiated a pilot field effectiveness of our anti-TNF monoclonal antibody targeting inflammatory bowel disease in dogs. This study is anticipated to report data in 2019.

Market Opportunities

We estimate that the total U.S. market for veterinary care was approximately \$69.4 billion in 2017. In 2017, 68% of households owned a pet, which translates to an estimated 89.7 million dogs and 94.2 million cats currently living in the United States. A recent study found that, on average, U.S. pet owners who have both dogs and cats would spend over \$10,000 to save one of their pets from a life-threatening illness or disease. We believe there are many unmet or underserved medical needs and that the pet therapeutics portion of the market can grow significantly as new, safe and effective therapeutics are identified, developed and marketed. We expect continued market growth as new pet therapeutics are developed and owners grow more familiar with the treatment of pets with such therapeutics.

Corporate Information

We were incorporated on September 25, 2012. Our principal executive offices are located at 1555 Bayshore Highway, Suite 200, Burlingame, California 94010, and our telephone number is (650) 701-7901. Our website address is www.kindredbio.com. The information contained on, or accessible through, our website is not incorporated by reference into this prospectus supplement or the accompanying prospectus, and you should not consider it to be a part of this prospectus supplement or the accompanying prospectus. Our website address is included as an inactive textual reference only.

From our initial public offering until December 31, 2018, we were an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"). As an emerging growth company, we elected to comply with certain reduced public reporting requirements in our annual reports, quarterly reports, proxy statements and other documents that we filed with the SEC prior to December 31, 2018, including the accompanying prospectus. Effective as of December 31, 2018, we ceased to be an emerging growth company. We are now both an "accelerated

filer" and a "smaller reporting company" as defined in Rule 12b-2 of the Exchange Act. During any

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period in which we continue to be a smaller reporting company by reason of having annual revenues of less than \$100 million and a "public float" of less than \$700 million, we may want to elect to comply in our filings with the SEC with some or all of the reduced public company reporting requirements that are available to a smaller reporting company, such as reduced executive compensation disclosure in proxy statements.

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THE OFFERING

Common stock offered
by us

shares

Offering Price \$

Common stock to be
outstanding immediately after this offering shares (or shares if the underwriters exercise in full their option to purchase additional shares)

Option to purchase additional shares We have granted the underwriters an option to purchase up to additional shares of our common stock. This option is exercisable, in whole or in part, for a period of 30 days from the date of this prospectus supplement.

Use of Proceeds We intend to use the net proceeds of this offering for the development of our therapeutic candidates, the expansion of our commercial infrastructure, and for other general corporate and working capital purposes. See "Use of Proceeds" on page S-11 of this prospectus supplement.

Risk Factors Investing in our common stock involves a high degree of risk. Before investing in our common stock, please read the "Risk Factors" section on page S-9 of this prospectus supplement and the corresponding sections in the accompanying prospectus and in our Annual Report on Form 10-K for the year ended December 31, 2017, as well as our subsequent filings with the SEC, which are incorporated herein by reference.

NASDAQ Symbol "KIN."

The number of shares of our common stock to be outstanding after this offering as set forth above is based on 33,815,647 shares of our common stock outstanding as of September 30, 2018, but excludes:
• 5,741,001 shares of common stock issuable upon exercise of stock options outstanding as of September 30, 2018, at a weighted average exercise price of \$7.25 per share; and
• 3,129,649 shares of common stock reserved for issuance under our 2018 equity incentive plan and our 2014 employee stock purchase plan as of September 30, 2018.

Unless otherwise indicated, this prospectus supplement reflects and assumes the following:

- no exercise of the outstanding options described above and no other stock awards made under our 2016 equity incentive plan, 2018 equity incentive plan or 2014 employee stock purchase plan; and
- no exercise by the underwriters of their option to purchase additional shares of our common stock.

RISK FACTORS

An investment in our common stock involves a high degree of risk. Before purchasing any of the common stock that we are offering, you should carefully read in their entirety this prospectus supplement and the accompanying prospectus, including the documents incorporated by reference into this prospectus supplement and the accompanying prospectus, and any free writing prospectus that we may authorize for use in this offering. In particular, you should carefully review the risks described below and in the “Risk Factors” sections that are contained in the accompanying prospectus and in our filings with the SEC that are incorporated by reference into this prospectus supplement and the accompanying prospectus, including, without limitation, the “Risk Factors” sections of our most recently filed Annual Report on Form 10-K and Quarterly Report on Form 10-Q 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 materially and adversely affected. This could cause the market price of our common stock to decline, resulting in a loss of all or part of your investment.

Risks Related to This Offering

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

We intend to use the net proceeds of this offering for the development of our therapeutic candidates, the expansion of our commercial infrastructure in anticipation of future product approvals and launches, for expansion of our manufacturing capacity and for other general corporate and working capital purposes. We may also use a portion of the net proceeds of this offering to acquire other products or businesses, although we are not currently a party to an agreement regarding any such acquisition. However, our management will have broad discretion in the application of the net proceeds from this offering and will have the right to use the net proceeds for purposes that differ substantially from our current plans. Management may spend the net proceeds in ways that do not improve our results of operations or enhance the value of our common stock. The failure by management to apply these funds effectively could result in financial losses that could have a material and adverse effect on our business and cause the price of our common stock to decline.

Our quarterly and annual operating results may be volatile and may vary significantly from the estimates and expectations of investors and third parties.

It is our practice not to provide forward-looking sales, revenue or earnings guidance and not to endorse any third party's sales, revenue or earnings estimates, including the estimates of industry or securities analysts. As a result, our actual operating results may be below the expectations of our investors and third parties, including industry or securities analysts. Investors should not rely on any estimates, research or reports published by third parties, including analysts. Further, many factors could cause our revenues and operating results to vary significantly in the future, including, but not limited to, those set out in the section entitled "Risk Factors" of our Annual Report on Form 10-K for the year ended December 31, 2017. Accordingly, we believe that quarter-to-quarter comparisons of our operating results are not necessarily meaningful. Investors should not rely on the results of one quarter as an indication of our future performance.

You will experience immediate and substantial dilution in the net tangible book value of your shares.

The public offering price of our common stock is substantially higher than the net tangible book value per share of our outstanding common stock before giving effect to this offering. Accordingly, if you purchase our common stock in this offering, you will incur immediate substantial dilution of approximately \$ per share, representing the difference between the public offering price and our as adjusted net tangible book value as of September 30, 2018. Furthermore, if outstanding options are exercised, you could experience further dilution. For a further description of the dilution that you will experience immediately after this offering, see the section in this prospectus supplement entitled “Dilution.” To the extent outstanding stock options are exercised, there may be further dilution to new investors.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the

price per share in this offering. The price per share at which we sell additional shares of our common stock, or securities convertible or exchangeable into common stock, in future transactions may be lower than the price per share paid by investors in this offering.

A substantial number of shares of common stock may be sold in the market following this offering, 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 following this offering could cause the market price of our common stock to decline. A substantial majority of the outstanding shares of our common stock are, and the shares of common stock sold in this offering upon issuance will be, freely tradable without restriction or further registration under the Securities Act. Our executive officers and directors have agreed with the underwriters not to dispose of or hedge any shares of our common stock or securities that are convertible into or exchangeable for shares of our common stock during the period from the date of this prospectus supplement continuing through the date 90 days hereafter, except with the prior written consent of the representatives of the underwriters, subject to certain standard exclusions. See “Underwriting - No Sales of Similar Securities.”

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USE OF PROCEEDS

We estimate that the net proceeds from this offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, will be approximately \$, or approximately \$ if the underwriters exercise their option to purchase additional shares in full.

We intend to use the net proceeds of this offering for the development of our therapeutic candidates, the expansion of our commercial infrastructure, and for other general corporate and working capital purposes. We may also use a portion of the net proceeds of this offering to acquire other products or businesses, although we are not currently a party to an agreement regarding any such acquisition.

Specifically, the offering proceeds, combined with our current available capital, are expected to be applied in our effort to reach the following development milestones: approval of Zimeta IV in the U.S., approval of Mirataz in Europe, approval of Zimeta Oral in the U.S., approval of Zimeta Oral in Europe, possible approval of an additional product in the U.S., completion of a pivotal study of IL31 antibody in canine atopic dermatitis, completion of a pivotal study of our candidate for equine gastric ulcer, initiation of a pivotal study of epoCat for feline anemia, completion of a pilot field efficacy study of IL31 antibody in canine atopic dermatitis, completion of a pilot field efficacy study of IL13/IL4 SINK in canine atopic dermatitis, completion of a pilot field efficacy study of TNF antibody in canine inflammatory bowel disease, completion of a pilot field efficacy study of an additional two to three undisclosed product candidates, and completion of a laboratory safety study of five to seven undisclosed product candidates. We have not determined the amounts we plan to spend in any of the areas identified above or the timing of these expenditures. As a result, our management will have broad discretion to allocate the net proceeds to us from this offering, and investors will be relying on the judgment of our management regarding the application of the proceeds from this offering. We reserve the right to change the use of these proceeds as a result of certain contingencies such as competitive developments, the results of our commercialization efforts, acquisition and investment opportunities and other factors. Pending use of the proceeds as described above, we intend to invest the net proceeds of this offering in short-term, interest-bearing, investment-grade securities or certificates of deposit.

PRICE RANGE OF OUR COMMON STOCK

Since December 12, 2013, our common stock has been traded on The Nasdaq Capital Market under the symbol “KIN.” Prior to December 12, 2013, there was no public trading market for our common stock. The following table sets forth the high and low sale prices for our common stock for the periods indicated as reported on The Nasdaq Capital Market.

| | High | Low |
|--|---------|---------|
| Fiscal Year Ending December 31, 2019 | | |
| First Quarter (through January 16, 2019) | \$12.16 | \$10.41 |
| Fiscal Year Ended December 31, 2018 | | |
| First Quarter | \$9.50 | \$7.55 |
| Second Quarter | \$12.00 | \$8.10 |
| Third Quarter | \$15.75 | \$10.05 |
| Fourth Quarter | \$15.11 | \$10.33 |
| Fiscal Year Ended December 31, 2017 | | |
| First Quarter | \$7.45 | \$4.35 |
| Second Quarter | \$9.65 | \$6.50 |
| Third Quarter | \$8.95 | \$6.55 |
| Fourth Quarter | \$9.80 | \$6.80 |

On January 16, 2019, the last reported sale price of our common stock on The Nasdaq Capital Market was \$11.03. As of January 16, 2019, there were 33,948,254 shares of our common stock outstanding held by approximately 21 holders of record. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our common stock. We intend to retain any future earnings and do not expect to pay any dividends in the foreseeable future. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to applicable laws, and will depend on a number of factors, including our financial condition, results of operations, capital requirements, contractual restrictions, general business conditions and other factors that our board of directors may deem relevant.

DILUTION

If you invest in our common stock in this offering, your ownership 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. As of September 30, 2018, we had a net tangible book value of \$104,431,000, or \$3.09 per share of common stock. Our net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of common stock outstanding at September 30, 2018.

After giving effect to the issuance and sale by us of shares of our common stock in the offering, and after deducting underwriting discounts and commissions and estimated offering expenses payable by us, our as adjusted net tangible book value as of September 30, 2018 would have been approximately \$ million, or approximately \$ per share. This amount represents an immediate increase in net tangible book value of approximately \$ per share to our existing stockholders and an immediate dilution in as adjusted net tangible book value of approximately \$ per share to new investors in this offering.

Dilution per share to new investors is determined by subtracting as adjusted net tangible book value per share after this offering from the public offering price per share paid by new investors. The following table illustrates this dilution on a per share basis:

| | |
|---|--------|
| Public offering price per share | \$ |
| Net tangible book value per share as of September 30, 2018 | \$3.09 |
| Increase in as adjusted net tangible book value per share attributable to this offering | \$ |
| As adjusted net tangible book value per share after this offering | \$ |
| Dilution per share to new investors participating in this offering | \$ |

The information above assumes that the underwriters will not exercise their option to purchase additional shares. If the underwriters exercise their option in full, our as adjusted net tangible book value per share at September 30, 2018 after giving effect to this offering would have been \$ per share, and the dilution in as adjusted net tangible book value per share to investors in this offering would have been \$ per share.

The above discussion and table are based on 33,815,647 shares of our common stock outstanding as of September 30, 2018 and do not give effect to the exercise of any outstanding stock options. To the extent that stock options are exercised or to the extent that other stock awards are made under our employee stock plans, there may be further dilution to new investors. As of September 30, 2018, there were 5,741,000 shares of our common stock issuable upon the exercise of stock options at a weighted average exercise price of \$7.25 per share.

UNDERWRITING

Subject to the terms and conditions set forth in the underwriting agreement, dated _____, 2019, between us and Barclays Capital Inc. and Stifel, Nicolaus & Company, Incorporated as representatives of the underwriters named below (the "Representatives"), and the joint book-running managers of this offering, we have agreed to sell to the underwriters, and each of the underwriters have agreed, severally and not jointly, to purchase from us, the shares shown opposite its name below.

| Underwriters | Number of Shares |
|--|------------------|
| Barclays Capital Inc. | |
| Stifel, Nicolaus & Company, Incorporated | |
| Total | |

The underwriting agreement provides that the obligations of the several underwriters are subject to certain conditions precedent such as the receipt by the underwriters of officers' certificates and legal opinions, approval of certain legal matters by their counsel and the representations and warranties made by us to the underwriters being true. The underwriting agreement provides that the several underwriters will purchase all of the shares of common stock if any of them are purchased.

The underwriters are offering the shares of common stock subject to its acceptance of the shares of common stock from us and subject to prior sale. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Option to Purchase Additional Shares

We have granted to the underwriters an option, exercisable for 30 days from the date of this prospectus supplement, to purchase, from time to time, in whole or in part, up to an aggregate of shares from us at the public offering price set forth on the cover page of this prospectus supplement, less underwriting discounts and commissions. If the underwriters exercise this option, each underwriter will be obligated, subject to certain conditions, to purchase a number of additional shares approximately proportionate to that underwriter's initial purchase commitment as indicated in the table above.

Commission and Expenses

The underwriters have advised us that they propose to offer the shares to the public at the public offering price set forth on the cover page of this prospectus supplement and to certain dealers, which may include the underwriters, at such offering price less a concession not in excess of \$ per share. If all the shares are not sold at the initial offering price following the initial offering, the Representatives may change the offering price and other selling terms.

The following table shows the public offering price, the underwriting discounts and commissions that we are to pay the underwriters and the proceeds, before expenses, to us in connection with this offering.

| | Per Share | | Total | |
|--|--|---|--|---|
| | Without Option to Purchase Additional Shares | With Option to Purchase Additional Shares | Without Option to Purchase Additional Shares | With Option to Purchase Additional Shares |
| Public offering price | \$ | \$ | \$ | \$ |
| Underwriting discounts and commissions | \$ | \$ | \$ | \$ |
| Proceeds to us, before expenses | \$ | \$ | \$ | \$ |

We estimate expenses payable by us in connection with this offering, other than the underwriting discounts and commissions referred to above, will be approximately \$. We have also agreed to reimburse the underwriters for up to \$10,000 for their FINRA counsels' fees and expenses, which reimbursed fee is deemed underwriting compensation for this offering by FINRA and for up to \$5,000 related to the registration and qualification of the shares of common stock under "blue sky" laws or provincial securities laws of Canada. The underwriters have agreed to reimburse us for certain expenses related to this offering.

Option to Purchase Additional Shares

We have granted to the underwriters an option, exercisable for 30 days from the date of this prospectus supplement, to purchase, from time to time, in whole or in part, up to an aggregate of shares from us at the public offering price set forth on the cover page of this prospectus supplement, less underwriting discounts and commissions. If the underwriters exercise this option, each underwriter will be obligated, subject to certain conditions, to purchase its pro rata portion of these additional shares based on the underwriter's percentage underwriting commitment in the offering as indicated in the table at the beginning of this Underwriting Section.

Listing

Our common stock is listed on The Nasdaq Capital Market under the trading symbol "KIN."

No Sales of Similar Securities

We, our directors and our executive officers have agreed, subject to certain specified exceptions, not to directly or indirectly, for a period of 90 days after the date of the underwriting agreement, without the prior written consent of the Representatives:

offer, pledge, assign, encumber, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock, or publicly announce an intention to do the same,

make any demand for or exercise any right with respect to, the registration of any shares of common stock or any security convertible into or exercisable or exchangeable for common stock, or publicly announce an intention to do the same, or

enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of our common stock, or publicly announce an intention to do the same, whether any such transaction described above is to be settled by delivery of common stock or such other securities, in cash or otherwise.

The restrictions in the immediately preceding paragraph do not apply in certain circumstances, including:

- the sale of shares by us to the underwriters;
- certain gifts, if such transfer is not for value;
- transfers or dispositions of shares of common stock or such other securities to any trust for the direct or indirect benefit of the party to the agreement or the immediate family of such party in a transaction not involving a disposition for value;
- transfers by will or intestate succession, if such transfer is not for value;
- transfers to us to satisfy the exercise price upon a cashless net exercise pursuant to our equity incentive plans disclosed in this prospectus supplement;
- entrance into a trading plan pursuant to Rule 10b5-1 under the Exchange Act, provided that such plan does not permit the sale of any common stock during the restricted period and no public announcement or filing is made regarding such plan during the restricted period;

provided that (1) in the case of any transfer or distribution pursuant to the second through (and including) the fourth clauses above, no filing under Section 16(a) of the Exchange Act or public announcement is required or voluntarily made during the restricted period (other than a filing on a Form 5 made after the expiration of the restricted period), (2) in the case of any transfer or distribution pursuant to the fifth clause above, no filing under Section 16(a) of the Exchange Act or public announcement, reporting a reduction in beneficial ownership of shares of our common stock, is required or voluntarily made during the restricted period and (3) in the case of any transfer or distribution

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pursuant to the second through fourth clauses above, the transferee agrees to sign and deliver a lock-up agreement substantially in the form of the lock-up agreements described above.

The Representatives, in their sole discretion, may release the common stock and other securities subject to the lock-up agreements described above in whole or in part at any time. When determining whether or not to release common stock and other securities from lock-up agreements, the Representatives will consider, among other factors, the holder's reasons for requesting the release, the number of shares of common stock and other securities for which the release is being requested and market conditions at the time.

Indemnification

We have agreed to indemnify the underwriters and certain of their controlling persons against certain liabilities, including liabilities under the Securities Act, and to contribute to payments that the underwriters may be required to make in respect of those liabilities.

Stabilization, Short Positions and Penalty Bids

The Representatives may engage in stabilizing transactions, short sales and purchases to cover positions created by short sales, and penalty bids or purchases for the purpose of pegging, fixing or maintaining the price of the common stock, in accordance with Regulation M under the Exchange Act:

Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum.

A short position involves a sale by the underwriters of shares in excess of the number of shares the underwriters are obligated to purchase in the offering, which creates the syndicate short position. This short position may be either a covered short position or a naked short position. In a covered short position, the number of shares involved in the sales made by the underwriters in excess of the number of shares they are obligated to purchase is not greater than the number of shares that they may purchase by exercising their option to purchase additional shares. In a naked short position, the number of shares involved is greater than the number of shares in their option to purchase additional shares. The underwriters may close out any short position by either exercising their option to purchase additional shares and/or purchasing shares in the open market. In determining the source of shares to close out the short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through their option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there could be downward pressure on the price of the shares in the open market after pricing that could adversely affect investors who purchase in the offering.

Syndicate covering transactions involve purchases of the common stock in the open market after the distribution has been completed in order to cover syndicate short positions.

Penalty bids permit the Representatives to reclaim a selling concession from a syndicate member when the common stock originally sold by the syndicate member is purchased in a stabilizing or syndicate covering transaction to cover syndicate short positions.

These stabilizing transactions, syndicate covering transactions and penalty bids may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of the common stock. As a result, the price of the common stock may be higher than the price that might otherwise exist in the open market. These transactions may be effected on The Nasdaq Capital Market or otherwise and, if commenced, may be discontinued at any time.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of the common stock. In addition, neither we nor any of the underwriters make any representation that the Representatives will engage in these stabilizing transactions or that any transaction, once commenced, will not be discontinued without notice.

Passive Market Making

In connection with the offering, underwriters and selling group members may engage in passive market making transactions in the common stock on The Nasdaq Capital Market in accordance with Rule 103 of Regulation

M under the Exchange Act during the period before the commencement of offers or sales of common stock and extending through the completion of distribution. A passive market maker must display its bids at a price not in excess of the highest independent bid of the security. However, if all independent bids are lowered below the passive market maker's bid that bid must be lowered when specified purchase limits are exceeded.

Electronic Distribution

A prospectus in electronic format may be made available on the Internet sites or through other online services maintained by one or more of the underwriters and/or selling group members participating in this offering, or by their affiliates. In those cases, prospective investors may view offering terms online and, depending upon the particular underwriter or selling group member, prospective investors may be allowed to place orders online. The underwriters may agree with us to allocate a specific number of shares for sale to online brokerage account holders. Any such allocation for online distributions will be made by the Representatives on the same basis as other allocations.

Other than the prospectus in electronic format, the information on any underwriter's or selling group member's web site and any information contained in any other web site maintained by an underwriter or selling group member is not part of the prospectus or the registration statement of which this prospectus forms a part, has not been approved and/or endorsed by us or any underwriter or selling group member in its capacity as underwriter or selling group member and should not be relied upon by investors.

Other Relationships

The underwriters and certain of their affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging, financing and brokerage activities. The underwriters and certain of their affiliates have, from time to time, performed, and may in the future perform, various commercial and investment banking and financial advisory services for the issuer and its affiliates, for which they received or may in the future receive customary fees and expenses.

In the ordinary course of their various business activities, the underwriters and certain of their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers, and such investment and securities activities may involve securities and/or instruments of the issuer or its affiliates. If the underwriters or their affiliates have a lending relationship with us, the underwriters or their affiliates may hedge, their credit exposure to us consistent with their customary risk management policies. Typically, the underwriters and their affiliates would hedge such exposure by entering into transactions which consist of either the purchase of credit default swaps or the creation of short positions in our securities or the securities of our affiliates, including potentially the shares of common stock offered hereby. Any such credit default swaps or short positions could adversely affect future trading prices of the shares of common stock offered hereby. The underwriters and certain of their affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such securities or instruments and may at any time hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Stamp Taxes

If you purchase shares of common stock offered in this prospectus supplement, you may be required to pay stamp taxes and other charges under the laws and practices of the country of purchase, in addition to the offering price listed on the cover page of this prospectus supplement.

NOTICE TO INVESTORS

Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares must be made in

accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus supplement or accompanying prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts ("NI 33-105"), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Australia

This prospectus supplement is not a disclosure document for the purposes of Australia's Corporations Act 2001 (Cth) of Australia, or Corporations Act, has not been lodged with the Australian Securities & Investments Commission and is only directed to the categories of exempt persons set out below. Accordingly, if you receive this prospectus in Australia:

You confirm and warrant that you are either:

- a "sophisticated investor" under section 708(8)(a) or (b) of the Corporations Act;
- a "sophisticated investor" under section 708(8)(c) or (d) of the Corporations Act and that you have provided an accountant's certificate to the company which complies with the requirements of section 708(8)(c)(i) or (ii) of the Corporations Act and related regulations before the offer has been made; or
- a "professional investor" within the meaning of section 708(11)(a) or (b) of the Corporations Act.

To the extent that you are unable to confirm or warrant that you are an exempt sophisticated investor or professional investor under the Corporations Act any offer made to you under this prospectus is void and incapable of acceptance. You warrant and agree that you will not offer any of the shares issued to you pursuant to this prospectus for resale in Australia within 12 months of those securities being issued unless any such resale offer is exempt from the requirement to issue a disclosure document under section 708 of the Corporations Act.

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State") an offer to the public of any common stock which are the subject of the offering contemplated herein may not be made in that Relevant Member State, except that an offer to the public in that Relevant Member State of any common stock may be made at any time under the following exemptions under the Prospectus Directive, if they have been implemented in that Relevant Member State:

- to legal entities which are qualified investors as defined under the Prospectus Directive;
- by the underwriters to fewer than 100, or, if the Relevant Member State has implemented the relevant provisions of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the Representatives of the underwriters for any such offer; or
- in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of common stock shall result in a requirement for us or any underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who receives any communication in respect of, or who acquires any common stock under, the offers contemplated here in this prospectus supplement will be deemed to have represented, warranted and agreed to and with each underwriter and us that:

it is a qualified investor as defined under the Prospectus Directive; and
in the case of any common stock acquired by it as a financial intermediary, as that term is used in Article 3(2) of the Prospectus Directive, (i) the common stock acquired by it in the offering have not been acquired on behalf of, nor have they been acquired with a view to their offer or resale to, persons in any Relevant Member State other than qualified investors, as that term is defined in the Prospectus Directive, or in the circumstances in which the prior consent of the Representatives of the underwriters has been given to the offer or resale or (ii) where common stock have been acquired by it on behalf of persons in any Relevant Member State other than qualified investors, the offer of such common stock to it is not treated under the Prospectus Directive as having been made to such persons.

For the purposes of this representation and the provision above, the expression an “offer of common stock to the public” in relation to any common stock in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and any common stock to be offered so as to enable an investor to decide to purchase or subscribe for the common stock, as the same may be varied in that Relevant Member State by any measure implementing the Prospectus Directive in that Relevant Member State, the expression “Prospectus Directive” means Directive 2003/71/EC (and amendments thereto, including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member State), and includes any relevant implementing measure in each Relevant Member State and the expression “2010 PD Amending Directive” means Directive 2010/73/EU.

Hong Kong

No securities have been offered or sold, and no securities may be offered or sold, in Hong Kong, by means of any document, other than to persons whose ordinary business is to buy or sell shares or debentures, whether as principal or agent; or to “professional investors” as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance; or in other circumstances which do not result in the document being a “prospectus” as defined in the Companies Ordinance (Cap. 32) of Hong Kong or which do not constitute an offer to the public within the meaning of the Companies Ordinance (Cap.32) of Hong Kong. No document, invitation or advertisement relating to the securities has been issued or may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted under the securities laws of Hong Kong) other than with respect to securities which are or are intended to be disposed of only to persons outside Hong Kong or only to “professional investors” as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance.

This prospectus supplement has not been registered with the Registrar of Companies in Hong Kong. Accordingly, this prospectus may not be issued, circulated or distributed in Hong Kong, and the securities may not be offered for subscription to members of the public in Hong Kong. Each person acquiring the securities will be required, and is deemed by the acquisition of the securities, to confirm that he is aware of the restriction on offers of the securities described in this prospectus supplement and the relevant offering documents and that he or she is not acquiring, and has not been offered any securities in circumstances that contravene any such restrictions.

United Kingdom

This prospectus supplement has only been communicated or caused to have been communicated and will only be communicated or caused to be communicated as an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act of 2000 (the “FSMA”)) as received in connection with the issue or sale of the common stock in circumstances in which Section 21(1) of the FSMA does not apply to us. All applicable provisions of the FSMA will be complied with in respect to anything done in relation to the common stock in, from or otherwise involving the United Kingdom.

Japan

The offering has not been and will not be registered under the Financial Instruments and Exchange Law of Japan (Law No. 25 of 1948 of Japan, as amended), or FIEL, and the Initial Purchaser will not offer or sell any securities, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means, unless otherwise provided herein, any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the FIEL and any other applicable laws, regulations and ministerial guidelines of Japan.

Singapore

This prospectus supplement has not been and will not be lodged or registered with the Monetary Authority of Singapore. Accordingly, this prospectus supplement and any other document or material in connection with the offer or sale, or the invitation for subscription or purchase of the securities may not be issued, circulated or distributed, nor may the securities be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to the public or any member of the public in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore, or the SFA, (ii) to a relevant person as defined under Section 275(2), or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions, specified in Section 275 of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of any other applicable provision of the SFA.

Where the securities are subscribed or purchased under Section 275 of the SFA by a relevant person which is: a corporation (which is not an accredited investor as defined under Section 4A of the SFA) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary is an accredited investor,

shares, debentures and units of shares and debentures of that corporation or the beneficiaries' rights and interest in that trust shall not be transferable for six months after that corporation or that trust has acquired the Offer Shares under Section 275 of the SFA except:

to an institutional investor under Section 274 of the SFA or to a relevant person defined in Section 275(2) of the SFA, or to any person pursuant to an offer that is made on terms that such shares, debentures and units of shares and debentures of that corporation or such rights and interest in that trust are acquired at a consideration of not less than \$200,000 (or its equivalent in a foreign currency) for each transaction, whether such amount is to be paid for in cash or by exchange of securities or other assets, and further for corporations, in accordance with the conditions, specified in Section 275 of the SFA;

where no consideration is given for the transfer; or

where the transfer is by operation of law.

Switzerland

The securities may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or SIX, or on any other stock exchange or regulated trading facility in Switzerland. This prospectus supplement has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this prospectus nor any other offering or marketing material relating to the securities or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this prospectus supplement nor any other offering or marketing material relating to the offering, the Company or the securities have been or will be filed with or approved by any Swiss regulatory authority. In particular, this prospectus will not be filed with, and the offer of securities will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, or FINMA, and the offer of securities has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection

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afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of securities.

Israel

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

LEGAL MATTERS

The validity of the shares of common stock offered by this prospectus supplement has been passed upon for us by TroyGould PC, Los Angeles, California. As of the date of this prospectus supplement, certain attorneys who are employed by TroyGould PC beneficially owned, in the aggregate, less than one percent of the outstanding shares of our common stock. Mintz, Levin, Cohn, Ferris, Glovsky, and Popeo P.C., Boston, Massachusetts, is counsel for the underwriters in connection with this offering.

EXPERTS

The consolidated financial statements of Kindred Biosciences, Inc. as of December 31, 2017 and 2016, and for each of the three years in the period ended December 31, 2017, that are incorporated by reference into this prospectus supplement, have been so incorporated in reliance upon the report of KMJ Corbin & Company LLP, an independent registered public accounting firm, incorporated by reference herein, given upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains a website at <http://www.sec.gov> that contains reports, proxy and information statements and other information about issuers, such as us, who file electronically with the SEC.

Our website address is www.kindredbio.com. The information contained on, or accessible through, our website is not incorporated by reference into this prospectus supplement or the accompanying prospectus, and you should not consider it to be a part of this prospectus supplement or the accompanying prospectus.

This prospectus supplement and the accompanying prospectus are part of a registration statement on Form S-3 that we filed with the SEC and do not contain all of the information in the registration statement. The full registration statement may be obtained from the SEC or us, as provided below. Other documents establishing the terms of the offered common stock are or may be filed as exhibits to the registration statement. Statements in this prospectus supplement or in the accompanying prospectus about these documents are summaries, and each statement is qualified in all respects by reference to the document to which it refers. You should refer to the actual documents for a more complete description of the relevant matters. You may inspect a copy of the registration statement through the SEC's website, as provided above.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC's rules allow us to "incorporate by reference" information into this prospectus supplement and the accompanying prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus supplement and the accompanying prospectus, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus supplement and the accompanying prospectus to the extent that a statement contained in this prospectus supplement or the accompanying prospectus modifies or replaces that statement.

We incorporate by reference the following documents or information previously filed by us with the SEC:

• Our Annual Report on Form 10-K for the year ended December 31, 2017, filed with the SEC on March 1, 2018;

Our Quarterly Reports on Form 10-Q for the quarterly periods ended March 31, 2018; June 30, 2018 and September 30, 2018, filed with the SEC on May 8, 2018; August 9, 2018 and November 7, 2018, respectively;

Our Current Reports on Form 8-K filed with the SEC on January 26, 2018, April 4, 2018, April 26, 2018, May 7, 2018, May 29, 2018, June 21, 2018, June 28, 2018, October 25, 2018, October 30, 2018 and January 14, 2019;

Our Definitive Proxy Statement on Schedule 14A, filed with the SEC on April 25, 2018;

The description of our common stock, which is registered under Section 12 of the Exchange Act, in our registration statement on Form 8-A, filed with the SEC on December 6, 2013, and any amendment or report subsequently filed for the purpose of updating such description; and

The description of our Series A preferred stock purchase rights contained in our registration statement on Form 8-A, filed with the SEC on May 24, 2017, and any amendment or report subsequently filed for the purpose of updating such description.

We also incorporate by reference into this prospectus supplement and the accompanying prospectus all reports and other documents that we subsequently file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act between the date of this prospectus supplement and the termination of the offering of the common stock described in this prospectus supplement. We are not, however, incorporating by reference any documents or portions thereof, whether specifically listed above or filed in the future, that are not deemed “filed” with the SEC, including any information furnished pursuant to Item 2.02 or 7.01 of Form 8-K or related exhibits furnished pursuant to Item 9.01 of Form 8-K. The reports and documents specifically listed above or filed in the future (excluding any information furnished to, rather than filed with, the SEC) are deemed to be part of this prospectus supplement and the accompanying prospectus from the date of the filing of each such report or document.

You may request a free copy of any of the documents incorporated by reference into this prospectus supplement and the accompanying prospectus by writing or telephoning us at the following address:

Kindred Biosciences, Inc.

1555 Bayshore Highway, Suite 200

Burlingame, California 94010

(650) 701-7901

Attention: Chief Financial Officer

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference into this prospectus supplement and the accompanying prospectus.

PROSPECTUS

KindredBio

"Best Medicines for Our Best Friends"

KINDRED BIOSCIENCES, INC.

\$150,000,000

Common Stock

Preferred Stock

Depositary Shares

Debt Securities

Warrants

Units

From time to time and in one or more offerings, we may sell up to \$150,000,000 in the aggregate of any or all of the securities identified above, either individually or in any combination. We will provide the specific terms of each offering, including the price and the type and amount of securities offered, in a supplement to this prospectus. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus. You should carefully read this prospectus, the applicable prospectus supplement and any related free writing prospectus, as well as any documents incorporated by reference, before buying any of the securities being offered.

We may offer and sell the securities described in this prospectus and any prospectus supplement to or through one or more underwriters, dealers and agents, or directly to purchasers, or through a combination of these methods. If any underwriters, dealers or agents are involved in the sale of any of the securities, we will include their names and the fees, commissions and discounts that they will receive, as well as the net proceeds to us, in the applicable prospectus supplement. See the sections of this prospectus entitled "About this Prospectus" and "Plan of Distribution" for more information. No securities may be sold without delivery of this prospectus and the applicable prospectus supplement.

Investing in our securities involves significant risks. See the "Risk Factors" on page 4 of this prospectus and in any similar section contained in the applicable prospectus supplement concerning factors you should consider before investing in our securities.

Our common stock is listed on The NASDAQ Capital Market under the symbol "KIN." On January 30, 2018, the last reported sale price of our common stock on The NASDAQ Capital Market was \$8.85 per share.

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 February 7, 2018.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission (the “SEC”) utilizing a “shelf” registration process. Under this shelf registration statement, we may, from time to time, sell any or all of the securities identified on the cover page of this prospectus, either individually or in any combination, and in one or more offerings, for total gross proceeds of up to \$150,000,000. This prospectus provides you with a general description of the securities we may offer.

Each time we offer a type or series of securities under this prospectus, we will provide a prospectus supplement that will contain more specific information about the terms of the offered securities. We also may authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. We also may add, update or change, in the prospectus supplement and in any related free writing prospectus that we may authorize to be provided to you, any of the information contained in this prospectus or in the documents that we have incorporated by reference into this prospectus. We urge you to read carefully this prospectus, any applicable prospectus supplement and any related free writing prospectus, together with the information incorporated herein by reference as described under the section entitled “Where You Can Find More Information; Incorporation by Reference” in this prospectus before buying any of the securities being offered. **THIS PROSPECTUS MAY NOT BE USED TO CONSUMMATE A SALE OF SECURITIES UNLESS IT IS ACCOMPANIED BY A PROSPECTUS SUPPLEMENT.**

You should rely only on the information that we have provided or incorporated by reference into this prospectus, any applicable prospectus supplement and any related free writing prospectus that we may authorize to be provided to you. We have not authorized any other person to provide you with different information. No dealer, salesperson or other person is authorized to give any information or to represent anything not contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus that we may authorize to be provided to you. You must not rely on any unauthorized information or representation. This prospectus, any applicable supplement to this prospectus or 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, any applicable supplement to this 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 assume that the information appearing in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate only as of the date on the front of the document and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any related free writing prospectus, or any sale of a security. Our business, financial condition, results of operations and prospects may have changed since those dates.

When we refer to “KindredBio,” “we,” “our,” “us” or the “company” in this prospectus, we mean Kindred

Biosciences, Inc., unless otherwise specified.

WHERE YOU CAN FIND MORE INFORMATION; INCORPORATION BY REFERENCE

Available Information

We file reports, proxy statements and other information with the SEC. Information filed with the SEC by us can be inspected and copied at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. You may also obtain copies of this information by mail from the Public Reference Section of the SEC at prescribed rates. Further information on the operation of the SEC's Public Reference Room in Washington, D.C. can be obtained by calling the SEC at 1-800-SEC-0330. The SEC also maintains a web site that contains reports, proxy and information statements and other information about issuers, such as us, who file electronically with the SEC. The address of that website is <http://www.sec.gov>.

Our website address is www.kindredbio.com. The information on our website, however, is not, and should not be deemed to be, part of this prospectus.

This prospectus and any prospectus supplement are part of a registration statement that we filed with the SEC and do not contain all of the information in the registration statement. The full registration statement may be obtained from the SEC or us, as provided below. Forms of the indenture and the other documents establishing the terms of the offered securities are or may be filed as exhibits to the registration statement or as exhibits to documents incorporated by reference into the registration statement. Statements in this prospectus or any prospectus supplement about these documents are summaries, and each statement is qualified in all respects by reference to the document to which it refers. You should refer to the actual documents for a more complete description of the relevant matters. You may inspect a copy of the registration statement at the SEC's Public Reference Room in Washington, D.C. or through the SEC's website, as provided above.

Incorporation by Reference

The SEC's rules allow us to "incorporate by reference" information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is deemed to be part of this prospectus, and subsequent information that we file with the SEC will automatically update and supersede that information. Any statement contained in a previously filed document incorporated by reference will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus modifies or replaces that statement.

We incorporate by reference into this prospectus the documents listed in the following paragraph that we have filed with the SEC pursuant to the Securities Exchange Act of 1934, as amended (the "Exchange Act"). We are not, however, incorporating by reference any documents or portions thereof, whether specifically listed below or filed in the future, that are not deemed "filed" with the SEC, including, without limitation, our Compensation

Committee report and performance graph and any information furnished pursuant to Item 2.02 or 7.01 of Form 8-K or related exhibits furnished pursuant to Item 9.01 of Form 8-K.

This prospectus and any accompanying prospectus supplement incorporate by reference the documents set forth below that have previously been filed by us with the SEC:

• Our Annual Report on Form 10-K for the fiscal year ended December 31, 2016, filed with the SEC on March 1, 2017, as amended by Amendment No. 1 on Form 10-K/A filed with the SEC on April 27, 2017;

• Our Quarterly Reports on Form 10-Q for the fiscal quarters ended March 31, 2017, June 30, 2017 and September 30, 2017, filed with the SEC on May 3, 2017, August 7, 2017 and November 7, 2017, respectively;

• Our Current Reports on Form 8-K, filed with the SEC on May 24, 2017, June 26, 2017, July 12, 2017, July 28, 2017, August 14, 2017, September 11, 2017, November 7, 2017 and January 26, 2018 respectively; provided, however, that we are incorporating by reference our Current Report on Form

8-K filed with the SEC on November 7, 2017 relating to Item 1.01 of Form 8-K, but we are not incorporating by reference our other Current Report on Form 8-K furnished to the SEC on November 7, 2017 relating to Item 2.02 of Form 8-K;

• Our Definitive Proxy Statement on Schedule 14A, filed with the SEC on June 8, 2017;

• The description of our common stock contained in our registration statement on Form 8-A, filed with the SEC on December 6, 2013, and any amendment or report subsequently filed for the purpose of updating such description; and

• The description of our Series A preferred share purchase rights contained in our registration statement on Form 8-A, filed with the SEC on May 24, 2017, and any amendment or report subsequently filed for the purpose of updating such description.

Each document that we subsequently file with the SEC pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the termination of this offering, including all such documents we may file with the SEC after the date of our initial registration statement and prior to the effectiveness of the registration statement, but excluding any information furnished to, rather than filed with, the SEC, will also be incorporated by reference into this prospectus and deemed to be part of this prospectus from the date of the filing of each such document.

You may request a free copy of any of the documents incorporated by reference into this prospectus by writing or telephoning us at the following address:

Kindred Biosciences, Inc.

1555 Bayshore Highway, Suite 200

Burlingame, California 94010

(650) 701-7901

Attention: Chief Financial Officer

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference into this prospectus and any accompanying prospectus supplement.

THE COMPANY

We are a pre-commercialization stage biopharmaceutical company focused on saving and improving the lives of pets. Our mission is to bring to our pets the same kinds of safe and effective medicines that our human family members enjoy. Our core strategy is to identify compounds and targets that have already demonstrated safety and efficacy in humans and to develop therapeutics based on these validated compounds and targets for pets, primarily dogs, cats and horses. We believe this approach will lead to shorter development times and higher approval rates than pursuing new, non-validated compounds and targets. We have submitted all major technical sections of the New Animal Drug Application to the Food and Drug Administration for two product candidates. In addition, we have multiple other product candidates, including several biologics, in various stages of development. We believe that there are significant unmet medical needs for pets, and that the pet therapeutics segment of the animal health industry is likely to grow substantially as new therapeutics are identified, developed and marketed specifically for pets.

We were incorporated on September 25, 2012 under the laws of the State of Delaware. Our principal executive offices are located at 1555 Bayshore Highway, Suite 200, Burlingame, California 94010, and our telephone number is (650) 701-7901.

RISK FACTORS

Investment in any securities offered pursuant to this prospectus and the applicable prospectus supplement involves significant risks. Before acquiring any of these securities, you should carefully consider the risks described under the heading "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2016, any amendment or update to such risk factors reflected in our subsequent Quarterly Reports on Form 10-Q and Current Reports on Form 8-K filed prior to the date of this prospectus and the risks described in our annual, quarterly and current reports that we file with the SEC after the date of this prospectus. All of the documents described in the preceding sentence are incorporated by reference into this prospectus. Before acquiring any of these securities, you should also carefully consider all risk factors and other information contained in, or incorporated by reference into, the applicable prospectus supplement and/or free writing prospectus. The occurrence of any of these risks might cause you to lose all or part of your investment.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into this prospectus and any prospectus supplement or free writing prospectus include forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Exchange Act. All statements, other than statements of historical fact, that address activities, events or developments that we believe or anticipate will or may occur in the future are forward-looking statements, including, statements about our plans, objectives, strategies and prospects regarding, among other things, our financial condition, operating results and business.

We have identified some of these forward-looking statements with words such as “believe,” “may,” “will,” “should,” “could,” “expect,” “intend,” “plan,” “predict,” “anticipate,” “estimate,” “continue” or other words and terms of similar meaning and the future dates. These forward-looking statements are based on current expectations about future events affecting us and are subject to uncertainties and factors relating to our operations and business environment, all of which are difficult to predict and many of which are beyond our control and could cause our actual results to differ materially from those matters expressed or implied by our forward-looking statements. Forward-looking statements are only predictions or statements of current plans and can be affected by inaccurate assumptions we might make or by known or unknown risks and uncertainties, including the risks described under the heading “Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2016, any amendment or update to such risk factors reflected in our subsequent Quarterly Reports on Form 10-Q and Current Reports on Form 8-K filed prior to the date of this prospectus and the risks described in our annual, quarterly and current reports that we file with the SEC after the date of this prospectus, all of which are incorporated by reference into this prospectus. Such risks and uncertainties are not exclusive and further information concerning us and our business, including factors that potentially could materially affect our financial results or condition, may emerge from time to time. We assume no obligation to update, amend or clarify forward-looking statements to reflect actual results or changes in factors or assumptions affecting such forward-looking statements, except as required by law.

USE OF PROCEEDS

Except as described in any prospectus supplement, we intend to use the net proceeds from the sale of the securities offered by this prospectus for the expansion of our commercial infrastructure in anticipation of future product approvals and launches, for expansion of our manufacturing capacity, for the development of our therapeutic candidates and for other general corporate and working capital purposes. We may also use a portion of such net proceeds to acquire other products or businesses, although we are not currently a party to an agreement regarding any such acquisition. We have not determined the amounts we plan to spend in any of these areas or the timing of these expenditures. As a result, our management will have broad discretion to allocate such net proceeds, and investors will be relying on the judgment of our management regarding the application of such net proceeds. We

reserve the right to change the use of these proceeds. Pending use of the proceeds as described above, we intend to invest such net proceeds in short-term, interest-bearing, investment-grade securities or certificates of deposit.

RATIO OF EARNINGS TO FIXED CHARGES

The following table sets forth the historical ratios of earnings to fixed charges for KindredBio for the periods indicated.

| | Year Ended December 31, | | | | Nine Months Ended September 30, |
|---|-------------------------|------|------|------|---------------------------------|
| | 2013 | 2014 | 2015 | 2016 | 2017 |
| Ratio of earnings to fixed charges | N/A | N/A | N/A | N/A | N/A |
| Deficiency of earnings available to cover fixed charges | (b) | (c) | (d) | (e) | (f) |

(x) From inception (September 25, 2012) through December 31, 2012.

(a) Earnings in the fiscal year ended December 31, 2012 were inadequate to cover fixed charges. The coverage deficiency was approximately \$120,000.

(b) Earnings in the fiscal year ended December 31, 2013 were inadequate to cover fixed charges. The coverage deficiency was approximately \$4.2 million.

(c) Earnings in the fiscal year ended December 31, 2014 were inadequate to cover fixed charges. The coverage deficiency was approximately \$27.1 million.

(d) Earnings in the fiscal year ended December 31, 2015 were inadequate to cover fixed charges. The coverage deficiency was approximately \$27.0 million.

(e) Earnings in the fiscal year ended December 31, 2016 were inadequate to cover fixed charges. The coverage deficiency was approximately \$22.3 million.

(f) Earnings in the nine months ended September 30, 2017 were inadequate to cover fixed charges. The coverage deficiency was approximately \$21.0 million.

The above ratios were computed by dividing earnings by fixed charges. For this purpose, earnings are calculated as follows: (1) adding pre-tax income (loss) from operations, fixed charges and amortization of capitalized interest; and (2) then subtracting from such sum interest capitalized. Fixed charges consist of interest expense and that portion of rental expense associated with certain facility and equipment leases considered to be a reasonable estimate of the interest factor. For the periods indicated, we did not have any outstanding shares of preferred stock with required dividend payments. Therefore, the ratios of earnings to combined fixed charges and preferred stock dividends are identical to the ratios in the above table.

DESCRIPTION OF CAPITAL STOCK

General

Our authorized capital stock consists of 100,000,000 shares of common stock, par value \$0.0001 per share, and 10,000,000 shares of preferred stock, par value \$0.0001 per share. The following description of our capital stock and provisions of our amended and restated certificate of incorporation, our amended and restated bylaws, our Series A preferred stock certificate of designations and our Rights Agreement, dated as of May 19, 2017 (the “rights agreement”), with American Stock Transfer & Trust Company, LLC, as rights agent, is a summary and is qualified in its entirety by reference to the complete text of those documents. The documents have been filed with the SEC and have been filed, or incorporated by reference, as exhibits to our registration statement of which this prospectus forms a part.

Common Stock

As of December 31, 2017, there were 28,182,563 shares of our common stock outstanding and held of record by approximately 26 stockholders.

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders will be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends that may be declared by our board of directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue.

In the event of our liquidation or dissolution, the holders of common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the preferential rights of any outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of common stock are, and the shares of common stock offered by us pursuant to this prospectus will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue.

Preferred Stock

As of December 31, 2017, there were no shares of our preferred stock outstanding.

Under our amended and restated certificate of incorporation, our board of directors has the authority, without further action by stockholders, to designate one or more series of preferred stock and to fix the voting

powers, designations, preferences, limitations, restrictions and relative rights granted to or imposed upon the preferred stock, including dividend rights, conversion rights, voting rights, rights and terms of redemption, liquidation preference and sinking fund terms, any or all of which may be preferential to or greater than the rights of the common stock.

The authority possessed by our board to issue preferred stock could potentially be used to discourage attempts by third parties to obtain control of our company through a merger, tender offer, proxy contest or otherwise by making such attempts more difficult or more costly. Our board may issue preferred stock with voting rights, conversion rights and other rights that, if exercised, could adversely affect the voting power of the holders of common stock. Except as described below with respect to our rights agreement, we have no current agreements or understandings with respect to the issuance of preferred stock.

We will describe in a prospectus supplement relating to any series of preferred stock being offered pursuant to this prospectus the following terms:

- the designation of the series of preferred stock;
- the number of shares of the series of preferred stock offered, the liquidation preference per share and the offering price of the series;
- the dividend rate(s), period(s) or payment date(s) or method(s) of calculation applicable to the series of preferred stock;
- whether dividends are cumulative or non-cumulative and, if cumulative, the date from which dividends on the series of preferred stock will accumulate;
- the procedures for any auction and remarketing, if any, for the series of preferred stock;
- the provisions for a sinking fund, if any, for the series of preferred stock;
- the provisions for redemption, if applicable, of the series of preferred stock;
- any listing of the series of preferred stock on any securities exchange;
- the terms and conditions, if applicable, upon which the series of preferred stock will be convertible into common stock, including the conversion price or manner of calculation and conversion period;
- voting rights, if any, of the series of preferred stock;
- the material U.S. federal income tax considerations applicable to the series of preferred stock;
- the relative ranking and preferences of the series of preferred stock as to dividend rights and rights upon the liquidation, dissolution or winding up of our affairs;
- any limitations on issuance of any series of preferred stock ranking senior to or on a parity with the series of preferred stock being offered as to dividend rights and rights upon liquidation, dissolution or winding up of our affairs; and
- any other specific terms, preferences, rights, limitations or restrictions of the series of preferred stock.

Unless we specify otherwise in the applicable prospectus supplement, the preferred stock will rank, relating to dividends and upon our liquidation, dissolution or winding up:

• senior to all classes or series of our common stock and to all of our equity securities ranking junior to the preferred stock;

• on a parity with all of our equity securities the terms of which specifically provide that the equity securities rank on a parity with the preferred stock; and

• junior to all of our equity securities the terms of which specifically provide that the equity securities rank senior to the preferred stock.

In connection with entering into the rights agreement, we filed with the Secretary of State of the State of Delaware a Certificate of Designations of Series A Preferred Stock (the “certificate of designations”) that designated 100,000 shares of our preferred stock as Series A preferred stock. The dividend rights, conversion rights, voting rights, rights and terms of redemption, liquidation preference and other rights of the Series A preferred stock are set forth in the certificate of designations, which has been incorporated by reference as an exhibit to our registration statement of which this prospectus forms a part. No shares of our Series A preferred stock have been issued. Certain material provisions of the rights agreement and the certificate of designations are summarized below under “Rights Agreement.”

Stock Options

As of December 31, 2017, options to purchase an aggregate of 4,573,625 shares of our common stock at a weighted-average exercise price of \$6.57 per share were outstanding.

Anti-Takeover Effects of Our Certificate of Incorporation and Bylaws, Our Rights Agreement and Delaware Law
Certain provisions of our amended and restated certificate of incorporation, our amended and restated bylaws, our rights agreement and Delaware law contain provisions that could have the effect of delaying or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our board of directors. We believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock because, among other reasons, the negotiation of such proposals could improve their terms. However, these provisions may have the effect of preventing changes in our management. It is also possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

Certificate of Incorporation and Bylaws

Our amended and restated certificate of incorporation and amended and restated bylaws include provisions that:

- authorize our board of directors to issue, without further action by the stockholders, up to 10,000,000 shares of preferred stock in one or more series designated by the board of directors;
- require that any action to be taken by our stockholders be effected at a duly called annual or special meeting and not by written consent;
- specify that special meetings of our stockholders can be called only by our board of directors, the Chairman of the Board, the Chief Executive Officer or the President;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- provide that directors may be removed only for cause and only by the affirmative vote of the holders of at least two-thirds in voting power of the outstanding stock entitled to vote;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- establish that our board of directors is divided into three classes, Class I, Class II, and Class III, with each class serving staggered terms;
- specify that no stockholder is permitted to cumulate votes at any election of the board of directors; and
- require the affirmative vote of the holders of at least two-thirds in voting power of the outstanding stock entitled to vote to amend certain of the above-mentioned provisions.

Our amended and restated bylaws also provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of KindredBio to us or our stockholders, (3) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, or (4) any action asserting a claim governed by the internal affairs doctrine. Our amended and restated bylaws further provide that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock is deemed to have notice of, and to have consented to, the preceding provision.

Rights Agreement

On May 19, 2017, our board of directors approved and adopted the rights agreement and, on July 24, 2017, our stockholders approved the adoption of the rights agreement. The rights agreement is intended to protect our stockholders from coercive or otherwise unfair proposals to acquire control of KindredBio by significantly diluting the ownership interest of any person who acquires at least 20% of our outstanding common stock by providing all

other stockholders with the right to acquire additional shares of our preferred stock or common stock at a significant discount. The rights agreement is not intended to interfere with any merger or other acquisition that is approved by our board of directors because, among other things, the board is entitled to redeem the rights for a nominal price before a person acquires at least 20% of our common stock. The rights agreement is intended to encourage an acquiring person to negotiate a proposed merger or other business combination with our board of directors and management.

Pursuant to the rights agreement, each share of our common stock, whether currently outstanding or issued in the future, has attached to it a “right” that, upon the occurrence of a “distribution date” event described below, initially entitles the registered holder (other than an “acquiring person”) to purchase one one-thousandth of a share of Series A preferred stock at a price of \$25.00 per one one-thousandth of a share of preferred stock, subject to adjustment on the terms described in the rights agreement. In general, a person or group of affiliated or associated persons will become an “acquiring person” upon acquiring beneficial ownership of 20% or more of our common stock.

Until the earlier to occur of (1) 10 business days following a public announcement that a person or group of affiliated or associated persons has become an acquiring person or (2) 10 business days (or such later date as may be determined by our board of directors prior to such time as any person or group of affiliated or associated persons becomes an acquiring person) following the commencement of, or public announcement of an intention to make, a tender or exchange offer the consummation of which would result in any person or group of affiliated or associated persons becoming an acquiring person (the earlier of such dates being called the “distribution date”), the rights will be transferred only with our common stock. The rights are not exercisable until the distribution date.

As provided in the certificate of designations for the Series A preferred stock, if and when shares of Series A preferred stock are issued following a distribution date, each Series A share will be entitled, when, as and if declared, to a minimum preferential quarterly dividend payment of the greater of (1) \$10.00 per share and (2) an amount (subject to certain adjustments) equal to 1,000 times the dividend declared per share of common stock. In the event of our liquidation, dissolution or winding up, the holders of the Series A preferred stock will be entitled to a minimum preferential payment of the greater of (a) \$10.00 per share (plus any accrued but unpaid dividends) and (b) an amount (subject to certain adjustments) equal to 1,000 times the payment made per share of common stock. Each share of Series A preferred stock will have 1,000 votes, voting together with the common stock. In the event of any merger, consolidation or other transaction in which outstanding shares of common stock are converted or exchanged, each share of Series A preferred stock will be entitled to receive 1,000 times the amount received per share of common stock. These rights are protected by customary anti-dilution provisions. Because of the nature of the Series A preferred stock’s dividend, liquidation and voting rights, the value of the one one-thousandth interest in a share of Series A preferred stock purchasable upon exercise of each right should approximate the value of one share of common stock.

In the event that any person or group of affiliated or associated persons becomes an acquiring person, each holder of a right, other than an acquiring person (whose rights will become void), will thereafter have the right to receive upon exercise of a right that number of shares of common stock having a market value of two times the exercise price of the right. In the event that, after a person or group has become an acquiring person, KindredBio is acquired in a merger or other business combination transaction or 50% or more of its consolidated assets or earning power are sold, provision will be made so that each holder of a right, other than an acquiring person, will thereafter have the right to receive upon the exercise of a right that number of shares of common stock of the entity with which KindredBio has engaged in such transaction (or its parent) that at the time of such transaction have a market value of two times the exercise price of the right.

At any time after any person or group becomes an acquiring person and prior to the earlier of one of the events described in the previous paragraph or the acquisition by such acquiring person of 50% or more of the outstanding shares of our common stock, our board of directors may exchange the rights (other than rights owned by the acquiring person, which will have become void), in whole or in part, for shares of common stock or Series A preferred stock (or a series of our preferred stock having equivalent rights, preferences and privileges), at an exchange ratio of one share of common stock, or a fractional share of Series A preferred stock (or other preferred stock) equivalent in value thereto, per right.

At any time prior to the time an acquiring person becomes such, our board of directors may redeem the rights in whole, but not in part, at a price of \$0.0001 per right payable, at our option, in cash, shares of common stock or such other form of consideration as the board of directors may determine. Immediately upon any redemption of the rights, the right to exercise the rights will terminate and the only right of the holders of rights will be to receive the redemption price. For so long as the rights are redeemable, we may, except with respect to the redemption price, amend the rights agreement in any manner. After the rights are no longer redeemable, we may, except with respect to the redemption price, amend the rights agreement in a manner that does not adversely affect the interests of holders of the rights. Until a right is exercised or exchanged, the holder of the right, as such, will have no rights as a stockholder of KindredBio, including, without limitation, the right to vote or to receive dividends.

The rights will expire on May 18, 2020 unless that expiration date is extended or the rights are earlier redeemed or exchanged by us. The purchase price payable, and the number of shares of Series A preferred stock or other securities or property issuable, upon exercise of the rights is subject to adjustment from time to time to prevent dilution upon the terms described in the rights agreement.

Delaware Anti-Takeover Statute

We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, Section 203 prohibits a publicly-held Delaware corporation such as KindredBio

from engaging in a “business combination” with an “interested stockholder” for a period of three years following the date the person became an interested stockholder unless:

prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, but not for determining the outstanding voting stock owned by the interested stockholder, (1) shares owned by persons who are directors and also officers of the corporation and (2) shares owned by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or

at or subsequent to the date of the transaction, the business combination is approved by the board of directors of the corporation and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66-2/3% of the outstanding voting stock which is not owned by the interested stockholder. In this context, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. An “interested stockholder” is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation’s outstanding voting stock. We expect the existence of this provision to have an anti-takeover effect with respect to transactions our board of directors does not approve in advance. We also anticipate that Section 203 may discourage business combinations or other attempts that might result in a premium over the market price for the shares of common stock held by our stockholders.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC.

NASDAQ Capital Market

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

DESCRIPTION OF DEPOSITARY SHARES

We may, at our option, elect to offer depositary shares rather than full shares of preferred stock. Each depositary share will represent ownership of and entitlement to all rights and preferences of a fraction of a share of preferred stock of a specified series (including any dividend, voting, redemption and liquidation rights). The applicable fraction will be specified in a prospectus supplement. The shares of preferred stock represented by the depositary shares will be deposited with a depositary named in the applicable prospectus supplement, under a deposit agreement among us, the depositary and the holders of the certificates evidencing depositary shares, or depositary receipts. Depositary receipts will be delivered to those persons purchasing depositary shares in the offering. The depositary will be the transfer agent, registrar and dividend disbursing agent for the depositary shares. Holders of depositary receipts agree to be bound by the deposit agreement, which requires holders to take certain actions such as filing proof of residence and paying certain charges.

The summary of the terms of the depositary shares contained in this prospectus does not purport to be complete and is subject to, and qualified in its entirety by, the provisions of the deposit agreement and our amended and restated certificate of incorporation and the certificate of designations that are, or will be, filed with the SEC for the applicable series of preferred stock.

Dividends

The depositary will distribute all cash dividends or other cash distributions received in respect of the series of preferred stock represented by the depositary shares to the record holders of depositary receipts in proportion to the number of depositary shares owned by such holders on the relevant record date, which will be the same date as the record date fixed by us for the applicable series of preferred stock. The depositary, however, will distribute only such amount as can be distributed without attributing to any depositary share a fraction of one cent, and any balance not so distributed will be added to and treated as part of the next sum received by the depositary for distribution to record holders of depositary receipts then outstanding.

In the event of a distribution other than in cash, the depositary will distribute property received by it to the record holders of depositary receipts entitled thereto, in proportion, as nearly as may be practicable, to the number of depositary shares owned by such holders on the relevant record date, unless the depositary determines (after consultation with us) that it is not feasible to make such distribution, in which case the depositary may (with our approval) adopt any other method for such distribution as it deems equitable and appropriate, including the sale of such property (at such place or places and upon such terms as it may deem equitable and appropriate) and distribution of the net proceeds from such sale to such holders.

Liquidation Preference

In the event of the liquidation, dissolution or winding up of the affairs of KindredBio, whether voluntary or involuntary, the holders of each depositary share will be entitled to the fraction of the liquidation preference accorded each share of the applicable series of preferred stock as set forth in the applicable prospectus supplement.

Redemption

If the series of preferred stock represented by the applicable series of depositary shares is redeemable, such depositary shares will be redeemed from the proceeds received by the depositary resulting from the redemption, in whole or in part, of the preferred stock held by the depositary. Whenever we redeem any preferred stock held by the depositary, the depositary will redeem as of the same redemption date the number of depositary shares representing the shares of preferred stock so redeemed. The depositary will mail the notice of redemption promptly upon receipt of such notice from us and not less than 30 nor more than 60 days prior to the date fixed for redemption of the preferred stock and the depositary shares to the record holders of the depositary receipts.

Voting

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

Withdrawal of Preferred Stock

Upon surrender of depositary receipts at the principal office of the depositary and payment of any unpaid amount due the depositary, and subject to the terms of the deposit agreement, the owner of the depositary shares evidenced thereby is entitled to delivery of the number of whole shares of preferred stock and all money and other property, if any, represented by such depositary shares. Partial shares of preferred stock will not be issued. If the depositary receipts delivered by the holder evidence a number of depositary shares in excess of the number of depositary shares representing the number of whole shares of preferred stock to be withdrawn, the depositary will deliver to such holder at the same time a new depositary receipt evidencing such excess number of depositary shares. Holders of preferred stock thus withdrawn will not thereafter be entitled to deposit such shares of preferred stock under the deposit agreement or to receive depositary receipts evidencing depositary shares with respect to such

shares of preferred stock.

Amendment and Termination of the Deposit Agreement

The form of depositary receipt evidencing the depositary shares and any provision of the deposit agreement may at any time and from time to time be amended by agreement between us and the depositary. However, any amendment which materially and adversely alters the rights of the holders (other than any change in fees) of depositary shares will not be effective unless such amendment has been approved by the holders of at least a majority of the depositary shares then outstanding. No such amendment may impair the right, subject to the terms of the deposit agreement, of any owner of any depositary shares to surrender the depositary receipt evidencing such depositary shares with instructions to the depositary to deliver to the holder the preferred stock and all money and other property, if any, represented thereby, except in order to comply with mandatory provisions of applicable law.

The deposit agreement will be permitted to be terminated by us upon not less than 30 days' prior written notice to the applicable depositary if a majority of each series of preferred stock affected by such termination consents to such termination, whereupon such depositary will be required to deliver or make available to each holder of depositary receipts, upon surrender of the depositary receipts held by such holder, such number of whole or fractional shares of preferred stock as are represented by the depositary shares evidenced by such depositary receipts together with any other property held by such depositary with respect to such depositary receipts. In addition, the deposit agreement will automatically terminate if (1) all outstanding depositary shares thereunder shall have been redeemed, (2) there shall have been a final distribution in respect of the related preferred stock in connection with any liquidation, dissolution or winding-up of KindredBio and such distribution shall have been distributed to the holders of depositary receipts evidencing the depositary shares representing such preferred stock, or (3) each share of the related preferred stock shall have been converted into stock of KindredBio not so represented by depositary shares.

Charges of the Depositary

We will pay all transfer and other taxes and governmental charges arising solely from the existence of the depositary arrangements. We will pay charges of the depositary in connection with the initial deposit of the preferred stock and initial issuance of the depositary shares, and redemption of the preferred stock and all withdrawals of preferred stock by owners of depositary shares. Holders of depositary receipts will pay transfer, income and other taxes and governmental charges and certain other charges as are provided in the deposit agreement to be for their accounts. In certain circumstances, the depositary may refuse to transfer depositary shares, may withhold dividends and distributions and sell the depositary shares evidenced by such depositary receipt if such charges are not paid. The applicable prospectus supplement will include information with respect to fees and charges, if any, in connection with the deposit or substitution of the underlying securities, the receipt and distribution of dividends, the sale or exercise of rights, the withdrawal of the underlying security and the transferring, splitting or grouping of

receipts. The applicable prospectus supplement will also include information with respect to the right to collect the fees and charges, if any, against dividends received and deposited securities.

Resignation and Removal of the Depositary

The depositary may resign at any time by delivering to us notice of its election to do so, and we may at any time remove the depositary, any such resignation or removal to take effect upon the appointment of a successor depositary and its acceptance of such appointment. Such successor depositary must be appointed within 60 days after delivery of the notice of resignation or removal and must be a bank or trust company having its principal office in the United States and having a combined capital and surplus of at least \$150,000,000.

Miscellaneous

The depositary will forward to the holders of depositary receipts all notices, reports and proxy soliciting material from us which are delivered to the depositary and which we are required to furnish to the holders of the preferred stock. In addition, the depositary will make available for inspection by holders of depositary receipts at the principal office of the depositary, and at such other places as it may from time to time deem advisable, any notices, reports and proxy soliciting material received from us which are received by the depositary as the holder of preferred stock. The applicable prospectus supplement will include information about the rights, if any, of holders of receipts to inspect the transfer books of the depositary and the list of holders of depositary receipts.

Neither the depositary nor KindredBio assumes any obligation or will be subject to any liability under the deposit agreement to holders of depositary receipts other than for its negligence or willful misconduct. Neither the depositary nor KindredBio will be liable if it is prevented or delayed by law or any circumstance beyond its control in performing its obligations under the deposit agreement. The obligations of the depositary and KindredBio under the deposit agreement will be limited to performance in good faith of their duties thereunder, and they will not be obligated to prosecute or defend any legal proceeding in respect of any depositary shares or preferred stock unless satisfactory indemnity is furnished. The depositary and KindredBio may rely on written advice of counsel or accountants, on information provided by holders of the depositary receipts or other persons believed in good faith to be competent to give such information and on documents believed to be genuine and to have been signed or presented by the proper party or parties.

In the event the depositary shall receive conflicting claims, requests or instructions from any holders of depositary receipts, on the one hand, and us, on the other hand, the depositary shall be entitled to act on such claims, requests or instructions received from us.

DESCRIPTION OF DEBT SECURITIES

The following description, together with the additional information we include in any applicable prospectus supplement or free writing prospectus, summarizes certain general terms and provisions of the debt securities that we may offer under this prospectus. When we offer to sell a particular series of debt securities, we will describe the specific terms of the series in a prospectus supplement. We will also indicate in the prospectus supplement to what extent the general terms and provisions described in this prospectus apply to a particular series of debt securities. To the extent the information contained in the prospectus supplement differs from this summary description, you should rely on the information in the prospectus supplement.

We may issue debt securities either separately, or together with, or upon the conversion or exercise of or in exchange for, other securities described in this prospectus. Debt securities may be our senior, senior subordinated or subordinated obligations and, unless otherwise specified in the prospectus supplement, the debt securities will be our direct, unsecured obligations and may be issued in one or more series.

The debt securities will be issued under an indenture between us and a trustee named in the prospectus supplement. We have summarized select portions of the indenture below. The summary is not complete. The form of the indenture has been filed as an exhibit to the registration statement of which this prospectus is a part, and you should read the indenture for provisions that may be important to you. Capitalized terms used in the summary and not defined in this prospectus have the meanings specified in the indenture.

General

The terms of each series of debt securities will be established by or pursuant to a resolution of our board of directors and set forth or determined in the manner provided in a resolution of our board of directors, in an officer's certificate or by a supplemental indenture. The particular terms of each series of debt securities will be described in a prospectus supplement relating to such series (including any pricing supplement or term sheet).

The indenture does not limit the amount of debt securities that we may issue under it. Debt securities issued under the indenture may be in one or more series with the same or various maturities, at par, at a premium, or at a discount. We will set forth in a prospectus supplement (including any pricing supplement or term sheet) relating to any series of debt securities being offered, the aggregate principal amount and the following terms of the debt securities, if applicable:

- the title and ranking of the debt securities (including the terms of any subordination provisions);
- the price or prices (expressed as a percentage of the principal amount) at which we will sell the debt securities;

- any limit on the aggregate principal amount of the debt securities;
- the date or dates on which the principal on a particular series of debt securities is payable;
- the rate or rates (which may be fixed or variable) per annum or the method used to determine the rate or rates (including any commodity, commodity index, stock exchange index or financial index) at which the debt securities will bear interest, the date or dates from which interest will accrue, the date or dates on which interest will commence and be payable and any regular record date for the interest payable on any interest payment date;
- the place or places where principal of, and interest, if any, on the debt securities will be payable (and the method of such payment), where the debt securities of such series may be surrendered for registration of transfer or exchange, and where notices and demands to us in respect of the debt securities may be delivered;
- the period or periods within which, the price or prices at which and the terms and conditions upon which we may redeem the debt securities;
- any obligation we have to redeem or purchase the debt securities pursuant to any sinking fund or analogous provisions or at the option of a holder of debt securities and the period or periods within which, the price or prices at which and the terms and conditions upon which the debt securities of a particular series shall be redeemed or purchased, in whole or in part, pursuant to such obligation;
- the dates on which and the price or prices at which we will repurchase debt securities at the option of the holders of debt securities and other detailed terms and provisions of these repurchase obligations;
- the denominations in which the debt securities will be issued, if other than denominations of \$1,000 and any integral multiple thereof;
- whether the debt securities will be issued in the form of certificated debt securities or global debt securities;
- the portion of principal amount of the debt securities payable upon declaration of acceleration of the maturity date, if other than the principal amount;
- the currency of denomination of the debt securities, which may be U.S. dollars or any foreign currency, and if such currency of denomination is a composite currency, the agency or organization, if any, responsible for overseeing such composite currency;
- the designation of the currency, currencies or currency units in which payment of principal of, and premium and interest on, the debt securities will be made;
- if payments of principal of, or premium or interest on, the debt securities will be made in one or more currencies or currency units other than that or those in which the debt securities are denominated, the manner in which the exchange rate with respect to these payments will be determined;
 - the manner in which the amounts of payment of principal of, and premium, if any, and interest on, the debt securities will be determined, if these amounts 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;

- any provisions relating to any security provided for the debt securities;
 - any addition to, deletion of or change in the events of default described in this prospectus or in the indenture with respect to the debt securities and any change in the acceleration provisions described in this prospectus or in the indenture with respect to the debt securities;
 - any addition to, deletion of or change in the covenants described in this prospectus or in the indenture with respect to the debt securities;
 - any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents with respect to the debt securities;
- the provisions, if any, relating to conversion or exchange of any debt securities of such series, including if applicable, the conversion or exchange price and period, provisions as to whether conversion or exchange will be mandatory, the events requiring an adjustment of the conversion or exchange price and provisions affecting conversion or exchange;
- any other terms of the debt securities, which may supplement, modify or delete any provision of the indenture as it applies to that series, including any terms that may be required under applicable law or regulations or advisable in connection with the marketing of the securities; and
- whether any of our direct or indirect subsidiaries will guarantee the debt securities of that series, including the terms of subordination, if any, of such guarantees.

We may issue debt securities that provide for an amount less than their stated principal amount to be due and payable upon declaration of acceleration of their maturity pursuant to the terms of the indenture. We will provide you with information on the material U.S. federal income tax considerations applicable to any of these debt securities in the applicable prospectus supplement.

If we denominate the purchase price of any of the debt securities in a foreign currency or currencies or a foreign currency unit or units, or if the principal of, and premium, if any, and interest on, any series of debt securities is payable in a foreign currency or currencies or a foreign currency unit or units, we will provide you with information on the restrictions, elections, general tax considerations, specific terms and other information with respect to that issue of debt securities and such foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

Transfer and Exchange

Each debt security will be represented by either one or more global securities registered in the name of The Depository Trust Company (“DTC” or “the Depository”) or a nominee of the Depository (we will refer to any debt security represented by a global debt security as a “book-entry debt security”), or a certificate issued in definitive registered form (we will refer to any debt security represented by a certificated security as a “certificated debt security”) as set forth in the applicable prospectus supplement. Except as set forth under the heading “Legal Ownership of Securities” below, book-entry debt securities will not be issuable in certificated form.

Certificated Debt Securities

You may transfer or exchange certificated debt securities at any office we maintain for this purpose in accordance with the terms of the indenture. No service charge will be made for any transfer or exchange of certificated debt securities, but we may require payment of a sum sufficient to cover any tax or other governmental charge payable in connection with a transfer or exchange.

You may effect the transfer of certificated debt securities and the right to receive the principal of, premium and interest on certificated debt securities only by surrendering the certificate representing those certificated debt securities and either reissuance by us or the trustee of the certificate to the new holder or the issuance by us or the trustee of a new certificate to the new holder.

Global Debt Securities and Book-Entry System

Each global debt security representing book-entry debt securities will be deposited with, or on behalf of, the Depositary, and registered in the name of the Depositary or a nominee of the Depositary. Please see the section of this prospectus entitled "Legal Ownership of Securities" for more information.

Covenants

We will set forth in the applicable prospectus supplement any restrictive covenants applicable to any issue of debt securities.

No Protection in the Event of a Change of Control

Unless we state otherwise in the applicable prospectus supplement, the debt securities will not contain any provisions that may afford holders of the debt securities protection in the event we have a change in control or in the event of a highly leveraged transaction (whether or not such transaction results in a change in control) that could adversely affect holders of debt securities.

Consolidation, Merger and Sale of Assets

We may not consolidate with or merge with or into, or convey, transfer or lease all or substantially all of our properties and assets to, any person (a "successor person") unless:

we are the surviving corporation or the successor person (if other than KindredBio) is a corporation organized and validly existing under the laws of any U.S. domestic jurisdiction and expressly assumes our obligations on the debt securities and under the indenture;

immediately after giving effect to the transaction, no default or event of default, shall have occurred and be continuing; and

certain other conditions are met.

Notwithstanding the above, any of our subsidiaries may consolidate with, merge into or transfer all or part of its properties to us.

Events of Default

An “event of default” means with respect to any series of debt securities, any of the following:

- default in the payment of any interest upon any debt security of that series when it becomes due and payable, and continuance of such default for a period of 30 days (unless the entire amount of the payment is deposited by us with the trustee or with a paying agent prior to the expiration of the 30-day period);
- default in the payment of principal of any debt security of that series at its maturity;
- default in the performance or breach of any other covenant or warranty by us in the indenture or any debt security (other than a covenant or warranty that has been included in the indenture solely for the benefit of a series of debt securities other than that series), which default continues uncured for a period of 60 days after we receive written notice from the trustee or KindredBio and the trustee receive written notice from the holders of not less than 25% in principal amount of the outstanding debt securities of that series as provided in the indenture;
- certain voluntary or involuntary events of bankruptcy, insolvency or reorganization of KindredBio; or
- any other event of default provided with respect to debt securities of that series that is described in the applicable prospectus supplement.

No event of default with respect to a particular series of debt securities (except as to certain events of bankruptcy, insolvency or reorganization) necessarily constitutes an event of default with respect to any other series of debt securities. The occurrence of certain events of default or an acceleration under the indenture may constitute an event of default under certain indebtedness of ours or our subsidiaries outstanding from time to time.

We will provide the trustee written notice of any default or event of default within 30 days of becoming aware of the occurrence of such default or event of default, which notice will describe in reasonable detail the status of such default or event of default and what action we are taking or propose to take in respect thereof.

If an event of default with respect to debt securities of any series at the time outstanding occurs and is continuing, then the trustee or the holders of not less than 25% in principal amount of the outstanding debt securities of that series may, by a notice in writing to us (and to the trustee if given by the holders), declare to be due and payable immediately the principal of (or, if the debt securities of that series are discount securities, that portion of the principal amount as may be specified in the terms of that series) and accrued and unpaid interest, if any, on all debt securities of that series. In the case of an event of default resulting from certain events of bankruptcy, insolvency or reorganization, the principal (or such specified amount) of and accrued and unpaid interest, if any, on

all outstanding debt securities will become and be immediately due and payable without any declaration or other act on the part of the trustee or any holder of outstanding debt securities. At any time after a declaration of acceleration with respect to debt securities of any series has been made, but before a judgment or decree for payment of the money due has been obtained by the trustee, the holders of a majority in principal amount of the outstanding debt securities of that series may rescind and annul the acceleration if all events of default, other than the non-payment of accelerated principal and interest, if any, with respect to debt securities of that series, have been cured or waived as provided in the indenture. We refer you to the prospectus supplement relating to any series of debt securities that are discount securities for the particular provisions relating to acceleration of a portion of the principal amount of such discount securities upon the occurrence of an event of default.

The indenture provides that the trustee may refuse to perform any duty or exercise any of its rights or powers under the indenture unless the trustee receives indemnity satisfactory to it against any cost, liability or expense that might be incurred by it in performing such duty or exercising such right or power. Subject to certain rights of the trustee, the holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee or exercising any trust or power conferred on the trustee with respect to the debt securities of that series.

No holder of any debt security of any series will have any right to institute any proceeding, judicial or otherwise, with respect to the indenture or for the appointment of a receiver or trustee, or for any remedy under the indenture, unless: that holder has previously given to the trustee written notice of a continuing event of default with respect to debt securities of that series; and the holders of not less than 25% in principal amount of the outstanding debt securities of that series have made written request, and offered indemnity or security satisfactory to the trustee, to the trustee to institute the proceeding as trustee, and the trustee has not received from the holders of not less than a majority in principal amount of the outstanding debt securities of that series a direction inconsistent with that request and has failed to institute the proceeding within 60 days.

Notwithstanding any other provision in the indenture, the holder of any debt security will have an absolute and unconditional right to receive payment of the principal of, and premium and any interest on, that debt security on or after the due dates expressed in that debt security and to institute suit for the enforcement of payment.

The indenture requires us, within 120 days after the end of our fiscal year, to furnish to the trustee a statement as to compliance with the indenture. If a default or event of default occurs and is continuing with respect to the securities of any series and if it is known to a responsible officer of the trustee, the trustee shall mail to each holder of the securities of that series notice of a default or event of default within 90 days after it occurs or, if later, after a responsible officer of the trustee has knowledge of such default or event of default. The indenture provides

that the trustee may withhold notice to the holders of debt securities of any series of any default or event of default (except in payment on any debt securities of that series) with respect to debt securities of that series if the trustee determines in good faith that withholding notice is in the interest of the holders of those debt securities.

Modification and Waiver

We and the trustee may modify, amend or supplement the indenture or the debt securities of any series without the consent of any holder of any debt security:

- to cure any ambiguity, defect or inconsistency;
- to comply with covenants in the indenture described above under the heading “Consolidation, Merger and Sale of Assets”;
- to provide for uncertificated securities in addition to or in place of certificated securities;
- to add guarantees with respect to debt securities of any series or secure debt securities of any series;
- to surrender any of our rights or powers under the indenture;
- to add covenants or events of default for the benefit of the holders of debt securities of any series;
- to comply with the applicable procedures of the Depositary;
- to make any change that does not adversely affect the rights of any holder of debt securities;
- to provide for the issuance of and establish the form and terms and conditions of debt securities of any series as permitted by the indenture;
- to effect the appointment of a successor trustee with respect to the debt securities of any series and to add to or change any of the provisions of the indenture to provide for or facilitate administration by more than one trustee; or
- to comply with requirements of the SEC in order to effect or maintain the qualification of the indenture under the Trust Indenture Act of 1939.

We may also modify and amend the indenture with the consent of the holders of at least a majority in principal amount of the outstanding debt securities of each series affected by the modification or amendment. We may not make any modification or amendment without the consent of the holders of each affected debt security then outstanding if that amendment would:

- reduce the amount of debt securities whose holders must consent to an amendment, supplement or waiver;
- reduce the rate of or extend the time for payment of interest (including default interest) on any debt security;
- reduce the principal of or premium on or change the fixed maturity of any debt security or reduce the amount of, or
- postpone the date fixed for, the payment of any sinking fund or analogous obligation with respect to any series of debt securities;

- reduce the principal amount of discount securities payable upon acceleration of maturity;
- waive a default or event of default in the payment of the principal of, or premium or interest on, any debt security (except a rescission of acceleration of the debt securities of any series by the holders of at least a majority in aggregate principal amount of the outstanding debt securities of that series and a waiver of the payment default that resulted from such acceleration);
- make the principal of, or premium or interest on, any debt security payable in a currency other than that stated in the debt security;
- make any change to certain provisions of the indenture relating to, among other things, the right of the holders of debt securities to receive payment of the principal of, and premium and interest on, those debt securities and to institute suit for the enforcement of any such payment and to waivers or amendments; or
- waive a redemption payment with respect to any debt security.

Except for certain specified provisions, the holders of at least a majority in principal amount of the outstanding debt securities of any series may on behalf of the holders of all debt securities of that series waive our compliance with provisions of the indenture. The holders of a majority in principal amount of the outstanding debt securities of any series may on behalf of the holders of all of the debt securities of such series waive any past default under the indenture with respect to that series and its consequences, except a default in the payment of the principal of, or any interest on, any debt security of that series; provided, however, that the holders of a majority in principal amount of the outstanding debt securities of any series may rescind an acceleration and its consequences, including any related payment default that resulted from the acceleration.

Defeasance of the Debt Securities and Certain Covenants in Certain Circumstances

Legal Defeasance

The indenture provides that, unless otherwise provided by the terms of the applicable series of debt securities, we may be discharged from any and all obligations in respect of the debt securities of any series (subject to certain exceptions). We will be so discharged upon the deposit with the trustee, in trust, of cash and/or U.S. government obligations or, in the case of debt securities denominated in a single currency other than U.S. dollars, cash and/or government obligations of the government that issued or caused to be issued such currency, that, through the payment of interest and principal in accordance with their terms, will provide cash in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants or investment bank to pay and discharge each installment of principal of, premium and interest on, and any mandatory sinking fund payments in respect of, the debt securities of that series on the stated maturity of those payments in accordance with the terms of the indenture and those debt securities.

This discharge may occur only if, among other things, we have delivered to the trustee an opinion of counsel stating that we have received from, or there has been published by, the U.S. Internal Revenue Service a

ruling or, since the date of execution of the indenture, there has been a change in the applicable U.S. federal income tax law, in either case to the effect that, and based thereon such opinion shall confirm that, the holders of the debt securities of that series will not recognize income, gain or loss for U.S. federal income tax purposes as a result of the deposit, defeasance and discharge and will be subject to U.S. federal income tax on the same amounts and in the same manner and at the same times as would have been the case if the deposit, defeasance and discharge had not occurred.

Defeasance of Certain Covenants

The indenture provides that, unless otherwise provided by the terms of the applicable series of debt securities, upon compliance with certain conditions:

we may omit to comply with the covenant described under the heading “Consolidation, Merger and Sale of Assets” and certain other covenants set forth in the indenture, as well as any additional covenants that may be set forth in the applicable prospectus supplement; and

any omission to comply with those covenants will not constitute a default or an event of default with respect to the debt securities of that series (a “covenant defeasance”).

The conditions include:

depositing with the trustee cash and/or U.S. government obligations or, in the case of debt securities denominated in a single currency other than U.S. dollars, cash and/or government obligations of the government that issued or caused to be issued such currency, that, through the payment of interest and principal in accordance with their terms, will provide cash in an amount sufficient in the opinion of a nationally recognized firm of independent public accountants or investment bank to pay and discharge each installment of principal of, premium and interest on, and any mandatory sinking fund payments in respect of, the debt securities of that series on the stated maturity of those payments in accordance with the terms of the indenture and those debt securities; and

delivering to the trustee an opinion of counsel to the effect that we have received from, or there has been published by, the U.S. Internal Revenue Service a ruling or, since the date of execution of the indenture, there has been a change in the applicable U.S. federal income tax law, in either case to the effect that, and based thereon such opinion shall confirm that, the holders of the debt securities of that series will not recognize income, gain or loss for U.S. federal income tax purposes as a result of the deposit and related covenant defeasance and will be subject to U.S. federal income tax on the same amounts and in the same manner and at the same times as would have been the case if the deposit and related covenant defeasance had not occurred.

No Personal Liability of Directors, Officers, Employees or Stockholders

None of our past, present or future directors, officers, employees or stockholders, as such, will have any liability for any of our obligations under the debt securities or the indenture or for any claim based on, or in respect or by reason of, such obligations or their creation. By accepting a debt security, each holder waives and releases all such liability. This waiver and release is part of the consideration for the issue of the debt securities. However, this waiver and release may not be effective to waive liabilities under U.S. federal securities laws, and it is the view of the SEC that such a waiver is against public policy.

Governing Law

The indenture and the debt securities, including any claim or controversy arising out of or relating to the indenture or the debt securities, is governed by the laws of the State of New York.

The indenture provides that we, the trustee and the holders of the debt securities (by their acceptance of the debt securities) irrevocably waive, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to the indenture, the debt securities or the transactions contemplated thereby.

The indenture provides that any legal suit, action or proceeding arising out of or based upon the indenture or the transactions contemplated thereby may be instituted in the federal courts of the United States of America located in the City of New York or the courts of the State of New York in each case located in the City of New York, and we, the trustee and the holder of the debt securities (by their acceptance of the debt securities) irrevocably submit to the non-exclusive jurisdiction of such courts in any such suit, action or proceeding. The indenture further provides that service of any process, summons, notice or document by mail (to the extent allowed under any applicable statute or rule of court) to such party's address set forth in the indenture will be effective service of process for any suit, action or other proceeding brought in any such court. The indenture further provides that we, the trustee and the holders of the debt securities (by their acceptance of the debt securities) irrevocably and unconditionally waive any objection to the laying of venue of any suit, action or other proceeding in the courts specified above and irrevocably and unconditionally waive and agree not to plead or claim any such suit, action or other proceeding has been brought in an inconvenient forum.

DESCRIPTION OF WARRANTS

We may issue warrants for the purchase of our common stock, preferred stock, or debt securities or any combination of such securities. We may issue warrants independently or together with other securities, and the warrants may be attached to or separate from any offered securities. If a series of warrants will be issued under a separate warrant agreement to be entered into between us and the investors or a warrant agent, we will so specify in the applicable prospectus supplement.

The following summary of the material terms of the warrants and warrant agreements is subject to, and qualified in its entirety by reference to, all of the provisions of the warrants and any warrant agreement applicable to a particular series of warrants. The terms of any warrants offered under a prospectus supplement may differ from the terms described below. We urge you to read the applicable prospectus supplement and any related free writing prospectus, as well as the complete warrants and any warrant agreement that contain the terms of the warrants.

The material terms of any issue of warrants will be described in the prospectus supplement relating to the issue. Those terms may include:

- the number of shares of common stock or preferred stock purchasable upon the exercise of warrants to purchase such shares and the price at which such number of shares may be purchased upon exercise;
- a summary of the terms (including, without limitation, liquidation, dividend, conversion and voting rights) of the series of preferred stock purchasable upon exercise of warrants to purchase preferred stock as set forth in the certificate of designations for such series of preferred stock;
- the principal amount of debt securities that may be purchased upon exercise of a debt warrant and the exercise price for the warrants;
- the date, if any, on and after which the warrants and the related debt securities, preferred stock or common stock will be separately transferable;
- the terms of any rights to redeem or call the warrants;
- the date on which the right to exercise the warrants will commence and the date on which the right will expire;
- the material U.S. federal income tax consequences applicable to the warrants; and
- any additional material terms of the warrants, including terms, procedures, and limitations relating to the exchange, exercise and settlement of the warrants.

Each warrant will entitle its holder to purchase the principal amount of debt securities or the number of shares of preferred stock or common stock at the exercise price set forth in, or calculable as set forth in, the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of

the warrants may exercise the warrants at any time up to the specified time on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void. A holder of warrant certificates may exchange them for new warrant certificates of different denominations, present them for registration of transfer and exercise them at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement. Until any warrants to purchase debt securities are exercised, the holder of the warrants will not have any rights of holders of the debt securities that can be purchased upon exercise, including any rights to receive payments of principal, premium or interest on the underlying debt securities or to enforce covenants in the applicable indenture. Until any warrants to purchase common stock or preferred stock are exercised, the holders of the warrants will not have any rights of holders of the underlying common stock or preferred stock, including any rights to receive dividends or payments upon any liquidation, dissolution or winding up on the common stock or preferred stock, if any.

DESCRIPTION OF UNITS

We may issue units consisting of any combination of the other types of securities offered under this prospectus in one or more series. We may evidence each series of units by unit certificates that we will issue under a separate unit agreement. We may enter into unit agreements with a unit agent. Each unit agent will be a bank or trust company that we select. We will indicate the name and address of the unit agent in the applicable prospectus supplement relating to a particular series of units.

The following description, together with the additional information included in any applicable prospectus supplement, summarizes the general features of the units that we may offer under this prospectus. You should read any prospectus supplement and any free writing prospectus that we may authorize to be provided to you related to the series of units being offered, as well as the complete unit agreements that contain the terms of the units. Specific unit agreements will contain additional important terms and provisions and we will file each unit agreement as an exhibit to the registration statement of which this prospectus is a part, or will incorporate by reference from another report that we file with the SEC, the form of each unit agreement relating to units offered under this prospectus.

If we offer any units, certain terms of that series of units will be described in the applicable prospectus supplement, including, without limitation, the following, as applicable:

- the title of the series of units;
- identification and description of the separate constituent securities comprising the units;
- the price or prices at which the units will be issued;
- the date, if any, on and after which the constituent securities comprising the units will be separately transferable;
- the material U.S. federal income tax considerations applicable to the units; and
- any other material terms of the units and their constituent securities.

LEGAL OWNERSHIP OF SECURITIES

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

Book-Entry Holders

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

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

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

Street Name Holders

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

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

Legal Holders

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

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

Special Considerations for Indirect Holders

If you hold securities through a bank, broker or other financial institution, either in book-entry form or in street name, you should check with your own institution to find out:

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

Global Securities

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

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

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

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

Special Considerations for Global Securities

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

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

- an investor cannot cause the securities to be registered in his or her name, and cannot obtain non-global certificates for his or her interest in the securities, except in the special situations described below;
- an investor will be an indirect holder and must look to his or her own bank or broker for payments on the securities and protection of his or her legal rights relating to the securities, as described above;
- an investor may not be able to sell interests in the securities to some insurance companies and to other institutions that are required by law to own their securities in non-book-entry form;

an investor may not be able to pledge his or her interest in a global security in circumstances where certificates representing the securities must be delivered to the lender or other beneficiary of the pledge in order for the pledge to be effective;

the depositary's policies, which may change from time to time, will govern payments, transfers, exchanges and other matters relating to an investor's interest in a global security;

we and any applicable trustee have no responsibility for any aspect of the depositary's actions or for its records of ownership interests in a global security, nor do we or any applicable trustee supervise the depositary in any way; the depositary may, and we understand that DTC will, require that those who purchase and sell interests in a global security within its book-entry system use immediately available funds, and your broker or bank may require you to do so as well; and

financial institutions that participate in the depositary's book-entry system, and through which an investor holds its interest in a global security, may also have their own policies affecting payments, notices and other matters relating to the securities.

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

Special Situations When a Global Security Will Be Terminated

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

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

if the depositary notifies us that it is unwilling, unable or no longer qualified to continue as depositary for that global security and we do not appoint another institution to act as depositary within 90 days;

if we notify any applicable trustee that we wish to terminate that global security; or

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

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

PLAN OF DISTRIBUTION

We may sell the securities offered by this prospectus from time to time pursuant to underwritten public offerings, negotiated transactions, block trades or a combination of these methods or through underwriters or dealers, through agents and/or directly to one or more purchasers. The securities may be distributed from time to time in one or more transactions:

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

Each time that we sell securities offered by this prospectus, we will provide a prospectus supplement or supplements that will describe the method of distribution and set forth the terms and conditions of the offering of such securities, including the offering price of the securities and the proceeds to us.

Offers to purchase the securities being offered by this prospectus may be solicited directly. Agents may also be designated to solicit offers to purchase the securities from time to time. Any agent involved in the offer or sale of our securities will be identified in a prospectus supplement.

If a dealer is utilized in the sale of the securities being offered by this prospectus, the securities will be sold to the dealer, as principal. The dealer may then resell the securities to the public at varying prices to be determined by the dealer at the time of resale.

If an underwriter is utilized in the sale of the securities being offered by this prospectus, an underwriting agreement will be executed with the underwriter at the time of sale and the name of any underwriter will be provided in the prospectus supplement that the underwriter will use to make resales of the securities to the public. In connection with the sale of the securities, we, or the purchasers of securities for whom the underwriter may act as agent, may compensate the underwriter in the form of underwriting discounts or commissions. The underwriter may sell the securities to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for which they may act as agent. Unless otherwise indicated in a prospectus supplement, an agent will be acting on a best efforts basis and a dealer will purchase securities as a principal, and may then resell the securities at varying prices to be determined by the dealer. Any compensation paid to underwriters, dealers or agents in connection with the offering of the securities, and any discounts, concessions or commissions allowed by underwriters to participating dealers will be provided in the applicable prospectus supplement. Underwriters, dealers and agents participating in the distribution of the securities may be deemed to be underwriters within the meaning of the Securities Act, and any discounts and

commissions received by them and any profit realized by them on resale of the securities may be deemed to be underwriting discounts and commissions. We may enter into agreements to indemnify underwriters, dealers and agents against civil liabilities, including liabilities under the Securities Act, or to contribute to payments they may be required to make in respect thereof and to reimburse those persons for certain expenses.

Any common stock issued by us under this prospectus will be listed on The NASDAQ Capital Market, but any other securities may or may not be listed on a national securities exchange. To facilitate the offering of securities, certain persons participating in the offering may engage in transactions that stabilize, maintain or otherwise affect the price of the securities. This may include over-allotments or short sales of the securities, which involve the sale by persons participating in the offering of more securities than were sold to them. In these circumstances, these persons would cover such over-allotments or short positions by making purchases in the open market or by exercising their over-allotment option, if any. In addition, these persons may stabilize or maintain the price of the securities by bidding for or purchasing securities in the open market or by imposing penalty bids, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if securities sold by them are repurchased in connection with stabilization transactions. The effect of these transactions may be to stabilize or maintain the market price of the securities at a level above that which might otherwise prevail in the open market. These transactions may be discontinued at any time.

If indicated in the applicable prospectus supplement, underwriters or other persons acting as agents may be authorized to solicit offers by institutions or other suitable purchasers to purchase the securities at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on the date or dates stated in the prospectus supplement. These purchasers may include, among others, commercial and savings banks, insurance companies, pension funds, investment companies and educational and charitable institutions. We may engage in at the market offerings into an existing trading market in accordance with Rule 415(a)(4) under the Securities Act. In addition, we may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement so indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third party may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of stock. The third party in such sale transactions will be an underwriter and will be named in the applicable prospectus supplement. In addition, we may otherwise loan or pledge securities to a financial institution or other third party that in turn may sell the securities short using this prospectus and an applicable prospectus supplement. Such financial institution or other third party may transfer its economic short position to investors in our securities or in connection with a concurrent offering of other securities.

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. ("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.

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.

LEGAL MATTERS

TroyGould PC, Los Angeles, California, has issued an opinion regarding certain legal matters relating to the issuance of the securities offered by this prospectus. As of January 1, 2018, certain attorneys employed by TroyGould PC beneficially owned, in the aggregate, less than one percent of our common stock. Additional legal matters may be passed upon for us, any underwriters, dealers or agents by counsel that we will name in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements of Kindred Biosciences, Inc. incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2016 have been so incorporated in reliance on the report of KMJ Corbin & Company LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

Shares

KINDRED BIOSCIENCES, INC.

Common Stock

Prospectus Supplement
, 2019

Barclays
Stifel
