

Kindred Biosciences, Inc.
Form 424B5
January 17, 2019
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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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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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