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## CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Amount to be registered <sup>(1)</sup>	Proposed maximum offering price per share	Proposed maximum aggregate offering price	Amount of registration fee
Common stock, par value \$0.0001 per share	2,592,861 shares <sup>(2)</sup>	\$12.29 <sup>(4)</sup>	\$31,866,262	
Common stock, par value \$0.0001 per share	297,093 shares <sup>(3)</sup>	\$0.32 <sup>(5)</sup>	\$95,070	
Common stock, par value \$0.0001 per share	400,000 shares <sup>(3)</sup>	\$0.36 <sup>(5)</sup>	\$144,000	
Common stock, par value \$0.0001 per share	111,428 shares <sup>(3)</sup>	\$0.90 <sup>(5)</sup>	\$100,285	
Common stock, par value \$0.0001 per share	330,152 shares <sup>(3)</sup>	\$1.37 <sup>(5)</sup>	\$452,308	
Common stock, par value \$0.0001 per share	180,241 shares <sup>(3)</sup>	\$3.83 <sup>(5)</sup>	\$690,323	
Common stock, par value \$0.0001 per share	54,000 shares <sup>(3)</sup>	\$7.00 <sup>(5)</sup>	\$378,000	
Total	3,965,775 shares		\$33,726,248	\$4,343.94

Pursuant to Rule 416(a) of the Securities Act of 1933, this Registration Statement also covers such additional (1) shares of common stock as may become issuable under the 2012 Equity Incentive Plan (the "Plan") in the event of a stock split, stock dividend, recapitalization or other similar change in the common stock.

(2) Represents shares of common stock reserved for future issuance under the Plan and with respect to which the offering price is not currently known.

(3) Represents shares of common stock issuable upon the exercise of outstanding stock options under the Plan and with respect to which the offering price is known.

(4) The proposed maximum offering price per share and maximum aggregate offering price were estimated pursuant to Rule 457(c) of the Securities Act of 1933 on the basis of the \$12.29 average of the high and low sale prices of Registrant's common stock as reported on The NASDAQ Stock Market LLC on December 20, 2013.

(5) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(h) of the Securities Act based on the exercise price of the stock options.

PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

ITEM 1. PLAN INFORMATION.\*

ITEM 2. REGISTRANT INFORMATION AND EMPLOYEE PLAN INFORMATION.\*

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\* Information required by Part I to be continued in the Section 10(a) Prospectus is omitted from the Registration Statement in accordance with Rule 428 under the Securities Act of 1933, as amended.

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PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

ITEM 3. INCORPORATION OF DOCUMENTS BY REFERENCE.

The following documents, which have been filed with the Commission by Kindred Biosciences, Inc. (“Registrant”), pursuant to the Securities Act of 1933, as amended (the “Securities Act”), or the Securities Exchange Act of 1934, as amended (the “Exchange Act”), as applicable, are hereby incorporated by reference in, and shall be deemed to be a part of, this Registration Statement:

- (a) Registrant’s prospectus filed on December 11, 2013 with the Commission pursuant to Rule 424(b) under the Securities Act, which prospectus contains audited financial statements of Registrant for the period from September 25, 2012 (inception) through December 31, 2012; and
- (b) the description of Registrant’s common stock incorporated by reference in Registrant’s Form 8-A filed with the Commission on December 6, 2013 pursuant to the Exchange Act, and any amendment or report filed for the purpose of further updating such description.

All documents subsequently filed by the Registrant pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act subsequent to the date of this Registration Statement and prior to the filing of a post-effective amendment to this Registration Statement which indicates that all securities offered hereby have been sold or which deregisters all such securities then remaining unsold, shall be deemed to be incorporated by reference herein and to be a part hereof from the date of filing of such documents.

Any statement contained in this Registration Statement, in an amendment hereto or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein or in any subsequently filed amendment to this Registration Statement or in any document that also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement, except as to specific section of such statements as set forth therein.

Under no circumstances shall any information furnished under Item 2.02 or 7.01 of Form 8-K be deemed incorporated herein by reference unless such Form 8-K expressly provides to the contrary.

ITEM 4. DESCRIPTION OF SECURITIES.

Not applicable.

ITEM 5. INTEREST OF NAMED EXPERTS AND COUNSEL.

Not applicable.

ITEM 6. INDEMNIFICATION OF DIRECTORS AND OFFICERS.

Section 102(b)(7) of the Delaware General Corporation Law authorizes a corporation in its certificate of incorporation to eliminate or limit personal liability of directors of the corporation for violations of the directors’ fiduciary duty of care. However, directors remain liable for breaches of duties of loyalty, failing to act in good faith, engaging in intentional misconduct, knowingly violating a law, paying a dividend or approving a stock repurchase which was illegal under Delaware General Corporation Law Section 174 or obtaining an improper personal benefit. In addition, equitable remedies for breach of fiduciary duty of care, such as injunction or recession, are available.

Registrant’s amended and restated certificate of incorporation eliminates the personal liability of the members of our board of directors to the fullest extent permitted by the Delaware General Corporation

Law. Any repeal or modification of that provision by the stockholders of the corporation will not adversely affect any right or protection of a director of the corporation existing at the time of such repeal or modification.

Section 145 of the General Corporation Law of the State of Delaware provides that a corporation has the power to indemnify a director, officer, employee or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he was or is a party or is threatened to be made a party to any threatened, ending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Registrant's amended and restated bylaws provide for indemnification of Registrant's officers and directors to the fullest extent permitted by the Delaware General Corporation Law.

Additionally, Registrant has entered into indemnification agreements with its directors and officers in which Registrant has agreed to indemnify its directors and officers against certain expenses, judgments, fines, settlements and other amounts that are incurred by them in connection with the defense or settlement of certain proceedings. Further, Registrant maintains directors and officers liability insurance on behalf of the Registrant's officers and directors insuring them against liability incurred in such capacities or arising out of such status.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted for Registrant's directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, Registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

ITEM 7. EXEMPTION FROM REGISTRATION CLAIMED.

Not applicable.

ITEM 8. EXHIBITS.  
EXHIBIT INDEX

Exhibit No.	Description
4.1	Amended and Restated Certificate of Incorporation of Kindred Biosciences, Inc.(1)
4.2	Amended and Restated Bylaws of Kindred Biosciences, Inc.(2)
4.3	Kindred Biosciences, Inc. 2012 Equity Incentive Plan (3)
4.4	Form of Stock Option Agreement under 2012 Equity Incentive Plan (4)
5.1	Opinion of TroyGould PC
23.1	Consent of TroyGould PC (included in Exhibit 5.1)
23.2	Consent of KMJ Corbin & Company LLP
24.1	Power of Attorney (included in the signature page herein)

(1) Previously filed on December 17, 2013 as Exhibit 3.1 to Registrant's Report on Form 8-K and incorporated herein by reference.

(2) Previously filed on December 17, 2013 as Exhibit 3.2 to Registrant's Report on Form 8-K and incorporated herein by reference.

(3) Previously filed on November 8, 2013 as Exhibit 10.1(a) to Registrant's Registration Statement on Form S-1 (File No. 333-192242) and incorporated herein by reference.

(4) Previously filed on November 8, 2013 as Exhibit 10.1(b) to Registrant's Registration Statement on Form S-1 (File No. 333-192242) and incorporated herein by reference.

ITEM 9. UNDERTAKINGS.

(a) Registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of this Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this Registration Statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in this Registration Statement or any material change to such information in this Registration Statement; provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Commission by Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in this Registration Statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(b) Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of Registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in this Registration Statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of Registrant pursuant to the foregoing provisions, or otherwise, Registrant has been advised that in the opinion of the Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by Registrant of expenses incurred or paid by a director, officer or controlling person of Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.



**SIGNATURES**

In accordance with the requirements of the Securities Act of 1933, Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements of filing this Registration Statement on Form S-8 and authorized this Registration Statement to be signed on its behalf by the undersigned, in Burlingame, California, on December 23, 2013.

KINDRED BIOSCIENCES, INC.

By: /s/ Richard Chin, M.D.  
Richard Chin, M.D.  
President and Chief Executive Officer

**SIGNATURES AND POWER OF ATTORNEY**

We, the undersigned officers and directors of Kindred Biosciences, Inc., hereby severally constitute and appoint Richard Chin, M.D., our true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution in him or her his name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act, this Registration Statement has been signed by the following persons in the capacities held on the dates indicated

Signature	Title	Date
/s/ Richard Chin, M.D. Richard Chin, M.D.	President and Chief Executive Officer (Principal Executive Officer) and Director	December 23, 2013
/s/ Stephen S. Galliker Stephen S. Galliker	Chief Financial Officer (Principal Financial and Accounting Officer)	December 23, 2013
/s/ Ernest Mario Ernest Mario	Director	December 23, 2013
/s/ Ervin Veszprémi Ervin Veszprémi	Director	December 23, 2013
/s/ Oleg Nodelman Oleg Nodelman	Director	December 23, 2013
/s/ Raymond Townsend Raymond Townsend	Director	December 23, 2013

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