

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Amendment No. 5
to
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

ZAFGEN, INC.

(Exact name of Registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

2834
(Primary Standard Industrial
Classification Code Number)

20-3857670
(I.R.S. Employer
Identification No.)

One Broadway, 8th Floor
Cambridge, Massachusetts 02142
(617) 401-3041

(Address, including zip code and telephone number, including area code, of Registrant's principal executive offices)

Thomas E. Hughes, Ph.D.
Chief Executive Officer
Zafgen, Inc.
One Broadway, 8th Floor
Cambridge, Massachusetts 02142
(617) 401-3041

(Name, address, including zip code and telephone number, including area code, of agent for service)

Copies to:

Mitchell S. Bloom, Esq.
Michael J. Minahan, Esq.
Goodwin Procter LLP
Exchange Place
Boston, Massachusetts 02109
(617) 570-1000

Thomas E. Hughes, Ph.D.
Chief Executive Officer
Zafgen, Inc.
One Broadway, 8th Floor
Cambridge, Massachusetts 02142
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Patrick O'Brien, Esq.
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Prudential Tower
Boston, Massachusetts 02199
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Approximate date of commencement of proposed sale to public: As soon as practicable after this Registration Statement becomes effective.If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box: If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering: If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering: If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering:

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer Accelerated Filer Non-Accelerated Filer (Do not check if a smaller reporting company)Smaller Reporting Company **CALCULATION OF REGISTRATION FEE**

Title of Each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price(1)	Amount of Registration Fee(2)(3)
Common Stock, par value \$0.001 per share	\$92,000,000	\$11,850

(1) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act. Includes the offering price of shares that the underwriters have the option to purchase to cover over-allotments, if any.

(2) Calculated pursuant to Rule 457(o) under the Securities Act based on an estimate of the proposed maximum aggregate offering price.

(3) Registrant previously paid \$11,109 of such registration fee.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

EXPLANATORY NOTE

This Amendment No. 5 to the Registration Statement on Form S-1 (File No. 333-195391) of Zafgen, Inc. is being filed solely for the purpose of updating the proposed maximum aggregate offering price and the related SEC registration fee and FINRA filing fee in Item 13 of Part II – “Information Not Required in Prospectus”. Accordingly, the preliminary prospectus has been omitted. This filing does not modify any provision of the Registration Statement except as specifically noted herein.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution

The following table sets forth all expenses, other than the underwriting discounts and commissions, payable by Zafgen, Inc. (the “Company” or the “Registrant”) in connection with the sale of the common stock being registered. All the amounts shown are estimates except the SEC registration fee and the FINRA filing fee.

	<u>Amount</u>
SEC registration fee	\$ 11,850
FINRA filing fee	14,300
NASDAQ initial listing fee	125,000
Blue sky qualification fees and expenses	10,000
Printing and engraving expenses	400,000
Legal fees and expenses	865,000
Accounting fees and expenses	950,000
Transfer agent and registrar fees	2,500
Miscellaneous	51,350
Total	<u>\$2,430,000</u>

Item 14. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law permits a corporation to include in its charter documents, and in agreements between the corporation and its directors and officers, provisions expanding the scope of indemnification beyond that specifically provided by the current law.

Section 145(a) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation), because he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys’ fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding, if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful.

Section 145(b) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor because the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys’ fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made with respect to any claim, issue or matter as to which he or she 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, he or she is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or other adjudicating court shall deem proper.

Section 145(g) of the Delaware General Corporation Law provides, in general, that a corporation may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his or her status as such, whether or not the corporation would have the power to indemnify the person against such liability under Section 145 of the Delaware General Corporation Law.

The Company's amended and restated certificate of incorporation, which will become effective upon completion of the offering, provides for the indemnification of directors to the fullest extent permissible under Delaware law.

The Company's amended and restated by-laws, which will become effective upon completion of the offering, provide for the indemnification of officers, directors and third parties acting on the Company's behalf if such persons act in good faith and in a manner reasonably believed to be in and not opposed to the Company's best interest, and, with respect to any criminal action or proceeding, such indemnified party had no reason to believe his or her conduct was unlawful.

The Company is entering into indemnification agreements with each of its directors and executive officers, in addition to the indemnification provisions provided for in its charter documents, and the Company intends to enter into indemnification agreements with any new directors and executive officers in the future. These agreements will provide that we will indemnify each of our directors and executive officers, and such entities to the fullest extent permitted by law.

The underwriting agreement (to be filed as Exhibit 1.1 hereto) will provide for indemnification by the underwriters of the Company, and its executive officers and directors, and indemnification of the underwriters by the Company for certain liabilities, including liabilities arising under the Securities Act of 1933, as amended, in connection with matters specifically provided in writing by the underwriters for inclusion in the registration statement.

The Company intends to purchase and maintain insurance on behalf of any person who is or was a director or officer against any loss arising from any claim asserted against him or her and incurred by him or her in that capacity, subject to certain exclusions and limits of the amount of coverage.

Item 15. *Recent Sales of Unregistered Securities*

In the three years preceding the filing of this registration statement, we have issued the following securities that were not registered under the Securities Act:

Issuances of Capital Stock

On February 15, 2011, we issued an aggregate of 2,682,011 shares of our Series B redeemable convertible preferred stock to three investors for aggregate consideration of \$2,024,999.

On June 30, 2011, we issued an aggregate of 6,716,624 shares of our Series C redeemable convertible preferred stock to six investors for aggregate consideration of \$6,085,933. On December 1, 2011, we issued an aggregate of 2,207,260 of our Series C redeemable convertible preferred stock to two investors for aggregate consideration of \$1,999,998. On February 1, 2012, we issued an aggregate of 7,808,400 shares of our Series C redeemable convertible preferred stock to six investors for aggregate consideration of \$7,075,191.

On August 13, 2012 and November 8, 2012, we issued convertible promissory notes to two of our existing investors for an aggregate principal amount of \$6,000,000. On November 30, 2012, we issued an aggregate of 4,975,260 shares of our Series D redeemable convertible preferred stock to such investors upon conversion of the notes.

On November 30, 2012, we issued an aggregate of 6,653,988 shares of our Series D redeemable convertible preferred stock to four investors for aggregate consideration of \$9,044,101 in cash. On January 11, 2013, we issued an aggregate of 4,381,914 shares of our Series D redeemable convertible preferred stock to two investors for aggregate consideration of \$5,955,898.

On November 25, 2013, we issued an aggregate of 16,110,473 shares of our Series E redeemable convertible preferred stock to eight investors for aggregate consideration of \$35,000,002 in cash.

On February 28, 2014, we issued an aggregate of 204,101 shares of at Series E redeemable convertible preferred stock to four investors for aggregate consideration of \$443,409 in cash.

No underwriters were used in the foregoing transactions. All sales of securities described above were made in reliance upon the exemption from registration provided by Section 4(2) of the Securities Act (and/or Regulation D promulgated thereunder) for transactions by an issuer not involving a public offering. All of the foregoing securities are deemed restricted securities for the purposes of the Securities Act.

Grants of Stock Options

Since January 1, 2011, we have granted stock options to purchase an aggregate of 1,405,680 shares of our common stock, with exercise prices ranging from \$1.57 to \$9.67 per share, to employees, directors and consultants pursuant to our stock option plan. The issuances of these securities were exempt either pursuant to Rule 701, as a transaction pursuant to a compensatory benefit plan, or pursuant to Section 4(2), as a transaction by an issuer not involving a public offering.

Item 16. Exhibits and Financial Statement Schedules

(a) Exhibits.

The exhibits to the registration statement are listed in the Exhibit Index to this registration statement and are incorporated herein by reference.

(b) Financial Statement Schedules.

None.

Item 17. Undertakings

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended, may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the Securities and Exchange 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 the Registrant of expenses incurred or paid by a director, officer or controlling person of the 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, the 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 of 1933 and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes that:

(a) The undersigned Registrant will provide to the underwriters at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

(b) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form

of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(c) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus 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.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Commonwealth of Massachusetts, on the 16th day of June, 2014.

ZAFGEN, INC.

By: /s/ Thomas E. Hughes

Thomas E. Hughes, Ph.D.
Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities indicated below on the 16th day of June, 2014.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Thomas E. Hughes</u> THOMAS E. HUGHES, PH.D.	Chief Executive Officer and Director (Principal Executive Officer)	June 16, 2014
<u>/s/ Patricia L. Allen</u> PATRICIA L. ALLEN	Chief Financial Officer (Principal Financial and Accounting Officer)	June 16, 2014
<u>*</u> PETER BARRETT, PH.D.	Chairman of the Board of Directors	June 16, 2014
<u>*</u> BRUCE BOOTH, PH.D.	Director	June 16, 2014
<u>*</u> AVI GOLDBERG	Director	June 16, 2014
<u>*</u> JOHN L. LAMATTINA, PH.D.	Director	June 16, 2014
<u>*</u> KEVIN P. STARR	Director	June 16, 2014

* Pursuant to Power of Attorney

By: /s/ Thomas E. Hughes
THOMAS E. HUGHES, PH.D.

EXHIBIT INDEX

Exhibit No.	Description
1.1*	Form of Underwriting Agreement
3.1*	Seventh Amended and Restated Certificate of Incorporation of the Registrant, as currently in effect
3.2*	Form of Amended and Restated Certificate of Incorporation of the Registrant, to be in effect upon completion of the offering
3.3*	Second Amended and Restated By-laws of the Registrant and the amendments thereto, as currently in effect
3.4*	Form of Amended and Restated By-laws of the Registrant, to be in effect upon completion of the offering
4.1*	Specimen Common Stock Certificate
4.2*	Third Amended and Restated Investors' Rights Agreement by and among the Registrant and certain of its stockholders dated November 25, 2013
5.1*	Opinion of Goodwin Procter LLP
10.1*#	Amended and Restated 2006 Stock Option Plan and forms of award agreements thereunder
10.2*#	2014 Stock Option and Incentive Plan and forms of award agreements thereunder
10.3*†	Exclusive License Agreement by and between the Registrant and Chong Kun Dang Pharmaceutical Corp. of South Korea, dated July 6, 2009, as amended
10.4*	Lease Agreement by and between the Company and MIT One Broadway LLC, dated July 8, 2011, as amended by First Amendment to Lease, dated June 20, 2013
10.5*	Letter by and between the Registrant and Thomas E. Hughes, dated July 25, 2008
10.6*	Employee Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement by and between the Registrant and Thomas E. Hughes, dated July 29, 2008
10.7*	Letter by and between the Registrant and Dennis D. Kim, dated August 23, 2011
10.8*	Employee Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement by and between the Registrant and Dennis D. Kim, dated August 29, 2013
10.9*	Letter by and between the Registrant and Patricia L. Allen, dated December 10, 2012
10.10*	Employee Non-Competition, Non-Solicitation, Confidentiality and Assignment Agreement by and between the Registrant and Patricia L. Allen, dated August 29, 2013
10.11(a)*	Form of Indemnification Agreement, to be entered into between the Registrant and its directors
10.11(b)*	Form of Indemnification Agreement, to be entered into between the Registrant and its officers
10.12*#	Senior Executive Cash Incentive Bonus Plan
10.13*†	Exclusive License Agreement by and between the Registrant and Children's Medical Center Corporation, dated January 4, 2007, as amended January 15, 2007
10.14*	Commercial Lease by and between the Registrant and Minerva Holdings, LLC, dated May 15, 2014
10.15*#	2014 Employee Stock Purchase Plan
10.16*	Letter by and between the Registrant and Patrick Loustau, dated June 3, 2014
21.1*	Subsidiaries of the Registrant
23.1*	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm
23.2*	Consent of Goodwin Procter LLP (included in Exhibit 5.1)
24.1*	Power of Attorney (included on signature page)

* Previously filed.

† Application has been made to the Securities and Exchange Commission for confidential treatment of certain provisions. Omitted material for which confidential treatment has been requested has been filed separately with the Securities and Exchange Commission.

Represents management compensation plan.