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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549**

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**FORM S-8  
REGISTRATION STATEMENT  
UNDER  
THE SECURITIES ACT OF 1933**

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**ZAFGEN, INC.**

(Exact Name of Registrant as Specified in its Charter)

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Delaware  
(State or Other Jurisdiction of  
Incorporation or Organization)

27-3857670  
(I.R.S. Employer  
Identification No.)

Zafgen, Inc.  
One Broadway, 8th Floor  
Cambridge, Massachusetts 02142  
(617) 401-3041  
(Address of Principal Executive Offices)

Zafgen, Inc. Amended and Restated 2006 Stock Option Plan  
Zafgen, Inc. 2014 Stock Option and Incentive Plan  
Zafgen, Inc. 2014 Employee Stock Purchase Plan  
(Full Title of the Plans)

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Thomas E. Hughes, Ph.D.  
Chief Executive Officer  
Zafgen, Inc.  
One Broadway, 8th Floor  
Cambridge, Massachusetts 02142  
(Name and Address of Agent For Service)

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*Copy to:*

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

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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

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**CALCULATION OF REGISTRATION FEE**

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Title 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, \$0.001 par value per share	1,513,353 shares <sup>(2)</sup>	\$2.94 <sup>(3)</sup>	\$4,449,258	\$574
Common Stock, \$0.001 par value per share	2,168,221 shares <sup>(4)</sup>	\$16.00 <sup>(5)</sup>	\$34,691,536	\$4,469
Common Stock, \$0.001 par value per share	265,000 shares <sup>(6)</sup>	\$16.00 <sup>(5)</sup>	\$4,240,000	\$547
Total	3,946,574 shares			\$5,590

- (1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the “Securities Act”), this Registration Statement shall also cover any additional shares of common stock which become issuable under the above-named plans by reason of any stock dividend, stock split, recapitalization or any other similar transaction effected without the receipt of consideration which results in an increase in the number of our outstanding shares of common stock. Pursuant to Rule 416(c) under the Securities Act, this Registration Statement shall also cover an indeterminate amount of interests to be offered or sold pursuant to the employee benefit plans described herein.
- (2) Represents shares of common stock issuable upon the exercise of outstanding options under the Amended and Restated 2006 Stock Option Plan, as amended (the “2006 Plan”). No further grants will be made under the 2006 Plan. To the extent outstanding awards under the 2006 Plan are forfeited, cancelled, held back upon exercise or settlement of an award to satisfy the exercise price or tax withholding, reacquired by the registrant prior to vesting, satisfied without any issuance of common stock, expire or are otherwise terminated (other than by exercise), the number of shares underlying such awards will be available for grant under the 2014 Stock Option and Incentive Plan (the “2014 Plan”). See footnote 4 below.
- (3) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457 of the Securities Act. For the shares of common stock reserved for issuance upon the exercise of outstanding awards granted under the 2006 Plan, the Proposed Maximum Offering Price Per Share is \$2.94 per share, which is the weighted average exercise price (rounded to the nearest cent) of the outstanding awards under the 2006 Plan.
- (4) Represents shares of common stock reserved for future issuance under the 2014 Plan (including 168,221 shares of common stock reserved for issuance under the 2006 Plan, which will be added to the shares reserved under the 2014 Plan). In addition to the shares registered under the 2014 Plan, to the extent that awards outstanding under the 2006 Plan as of the date of this Registration Statement are forfeited, cancelled, held back upon exercise or settlement of an award to satisfy the exercise price or tax withholding, reacquired by the registrant prior to vesting, satisfied without any issuance of common stock, expire or are otherwise terminated (other than by exercise), the number of shares underlying such awards will be available for future grant under the 2014 Plan. The 2014 Plan also provides that an additional number of shares will automatically be added to the shares authorized for issuance under the 2014 Plan on January 1 of each year. The number of shares added each year will be equal to the lesser of: (i) 4% of the outstanding shares on the immediately preceding December 31 or (ii) such amount as determined by the Compensation Committee of the registrant’s Board of Directors.
- (5) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457 of the Securities Act, and based on \$16.00, the initial public offering price of the registrant’s common stock set forth on the cover page of the registrant’s prospectus dated June 18, 2014 relating to its initial public offering.
- (6) Represents shares of common stock available for future issuance under the 2014 Employee Stock Purchase Plan.

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Proposed sales to take place as soon after the effective date of the Registration Statement as awards are granted, exercised or distributed under the above-named plans.

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**Part I**

**INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS**

**Item 1. Plan Information.\***

**Item 2. Registrant Information and Employee Plan Annual Information.\***

\* The information called for in Part I of Form S-8 is not being filed with or included in this Form S-8 (by incorporation by reference or otherwise) in accordance with the rules and regulations of the Securities and Exchange Commission (the "SEC").

**Part II**

**INFORMATION REQUIRED IN THE REGISTRATION STATEMENT**

**Item 3. Incorporation of Documents by Reference.**

The registrant hereby incorporates by reference into this Registration Statement the following documents filed with the SEC:

- (a) The prospectus filed by the registrant with the SEC pursuant to Rule 424(b) under the Securities Act, on June 19, 2014, relating to the Registration Statement on Form S-1, as amended (File No. 333-195391), which contains the registrant's audited financial statements for the latest fiscal year for which such statements have been filed; and
- (b) The description of the registrant's common stock contained in the registrant's Registration Statement on Form 8-A (File No. 001-36510), filed by the registrant with the SEC under Section 12(b) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), on June 18, 2014, including any amendments or reports filed for the purpose of updating such description.

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

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

Under no circumstances will any information filed under current items 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. Interests of Named Experts and Counsel.**

Not applicable.

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**Item 6. 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.

The registrant's amended and restated certificate of incorporation provides for the indemnification of directors to the fullest extent permissible under Delaware law.

The registrant's amended and restated by-laws provide for the indemnification of officers, directors and third parties acting on the registrant's behalf if such persons act in good faith and in a manner reasonably believed to be in and not opposed to the registrant'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 registrant has entered 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 registrant intends to enter into indemnification agreements with any new directors and executive officers in the future. These agreements provide for indemnification for all reasonable expenses and liabilities incurred in connection with any action or proceeding brought against them by reason of the fact that they are or were agents of the registrant.

The registrant has purchased and maintains 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.

These indemnification provisions and the indemnification agreements entered into between the registrant and its officers and directors may be sufficiently broad to permit indemnification of the registrant's officers and directors for liabilities (including reimbursement of expenses incurred) arising under the Securities Act.

**Item 7. Exemption from Registration Claimed.**

Not applicable.

**Item 8. Exhibits.**

See the Exhibit Index on the page immediately preceding the exhibits for a list of exhibits filed as part of this Registration Statement, which Exhibit Index is incorporated herein by reference.

**Item 9. Undertakings.**

(a) The 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 the 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 the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement.

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(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

*Provided, however,* that paragraphs (a)(1)(i) and (a)(1)(ii) herein do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Exchange Act (15 U.S.C. 78m or 78o(d)) that are incorporated by reference in the 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) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the 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 the 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.

(h) Insofar as indemnification for liabilities arising under the Securities Act 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 and will be governed by the final adjudication of such issue.

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## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Commonwealth of Massachusetts, on the 19th day of June, 2014.

### ZAFGEN, INC.

By: /s/ Thomas E. Hughes, Ph.D.

Thomas E. Hughes, Ph.D.

*Chief Executive Officer and Director*

## POWER OF ATTORNEY AND SIGNATURES

KNOW ALL BY THESE PRESENT, that each individual whose signature appears below hereby constitutes and appoints each of Thomas E. Hughes, Ph.D. and Patricia L. Allen as such person's true and lawful attorney-in-fact and agent with full power of substitution and resubstitution, for such person in such person's name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this Registration Statement on Form S-8, and to file the same, with all exhibits thereto, and all documents in connection therewith, with the Securities and Exchange Commission granting unto each said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as such person might or could do in person, hereby ratifying and confirming all that any said attorney-in-fact and agent, or any substitute or substitutes of any of them, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following person in the capacities and on the date indicated.

Name	Title	Date
<u>/s/ Thomas E. Hughes, Ph.D.</u> Thomas E. Hughes, Ph.D.	Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	June 19, 2014
<u>/s/ Patricia L. Allen</u> Patricia L. Allen	Chief Financial Officer <i>(Principal Financial and Accounting Officer)</i>	June 19, 2014
<u>/s/ Peter Barrett, Ph.D.</u> Peter Barrett, Ph.D.	Chairman of the Board of Directors	June 19, 2014
<u>/s/ Bruce Booth, Ph.D.</u> Bruce Booth, Ph.D.	Director	June 19, 2014
<u>/s/ Avi Goldberg</u> Avi Goldberg	Director	June 19, 2014
<u>/s/ John L. LaMattina, Ph.D.</u> John L. LaMattina, Ph.D.	Director	June 19, 2014
<u>/s/ Kevin P. Starr</u> Kevin P. Starr	Director	June 19, 2014
<u>/s/ Frank E. Thomas</u> Frank E. Thomas	Director	June 19, 2014

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**EXHIBIT INDEX**

<u>Exhibit No.</u>	<u>Description</u>
4.1	Form of Common Stock certificate of the registrant (Incorporated by reference to Exhibit 4.1 to the registrant's Registration Statement on Form S-1, as amended (File No. 333-195391)).
4.2	Form of Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.2 to the registrant's Registration Statement on Form S-1, as amended (File No. 333-195391)).
4.3	Form of Amended and Restated By-laws (Incorporated by reference to Exhibit 3.4 to the registrant's Registration Statement on Form S-1, as amended (File No. 333-195391)).
4.4	Third Amended and Restated Investors' Rights Agreement by and among the registrant and certain of its stockholders, dated as of November 25, 2013 (Incorporated by reference to Exhibit 4.2 to the registrant's Registration Statement on Form S-1, as amended (File No. 333-195391)).
5.1*	Opinion of Goodwin Procter LLP.
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).
99.1	Amended and Restated 2006 Stock Option Plan, as amended, and forms of agreements thereunder (Incorporated by reference to Exhibit 10.1 to the registrant's Registration Statement on Form S-1, as amended (File No. 333-195391)).
99.2	2014 Stock Option and Incentive Plan and forms of agreements thereunder (Incorporated by reference to Exhibit 10.2 to the registrant's Registration Statement on Form S-1 (File No. 333-195391)).
99.3	2014 Employee Stock Purchase Plan (Incorporated by reference to Exhibit 10.15 to the registrant's Registration Statement on Form S-1 (File No. 333-195391)).

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\* Filed herewith.

June 19, 2014

Zafgen, Inc.  
One Broadway, 8th Floor  
Cambridge, MA 02142

Re: Securities Being Registered under Registration Statement on Form S-8

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-8 (the "Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), on or about the date hereof relating to an aggregate of 3,946,574 shares (the "Shares") of Common Stock, \$0.001 par value per share, of Zafgen, Inc., a Delaware corporation (the "Company"), that may be issued pursuant to the Company's Amended and Restated 2006 Stock Option Plan, 2014 Stock Option and Incentive Plan, and 2014 Employee Stock Purchase Plan (collectively, the "Plans").

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions set forth below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinion set forth below, on certificates of officers of the Company.

The opinion set forth below is limited to the Delaware General Corporation Law (which includes reported judicial decisions interpreting the Delaware General Corporation Law).

For purposes of the opinion set forth below, we have assumed that a sufficient number of authorized but unissued shares of the Company's Common Stock will be available for issuance when the Shares are issued.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the Plans, will be validly issued, fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ GOODWIN PROCTER LLP

GOODWIN PROCTER LLP



**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We hereby consent to the incorporation by reference in this Registration Statement on Form S-8 of our report dated March 14, 2014, except for Note 17, as to which the date is June 5, 2014, relating to the consolidated financial statements of Zafgen, Inc., which appears in Zafgen, Inc.'s Amendment No. 4 to the Registration Statement on Form S-1 (No. 333-195391).

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts

June 18, 2014