

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

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.)

Zafgen, Inc.
175 Portland Street, 4th Floor
Boston, Massachusetts 02114
(617) 622-4003

(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.
175 Portland Street, 4th Floor
Boston, Massachusetts 02114
(617) 622-4003

(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.
Laurie A. Burlingame, Esq.
Goodwin Procter LLP
Exchange Place
Boston, Massachusetts 02109
(617) 570-1000

Thomas E. Hughes, Ph.D.
Chief Executive Officer
Zafgen, Inc.
175 Portland Street, 4th Floor
Boston, Massachusetts 02114
(617) 622-4003

Patrick O'Brien, Esq.
Ropes & Gray LLP
Prudential Tower
Boston, Massachusetts 02199
(617) 951-7000

Approximate date of commencement of proposed sale to the 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, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. 333-201439

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 definition 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

Smaller reporting company

(Do not check if a smaller reporting company)

CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Amount to be registered ⁽¹⁾	Proposed maximum offering price per share ⁽²⁾	Proposed maximum aggregate offering price	Amount of registration fee ⁽³⁾
Common stock, \$0.001 par value per share	539,806	\$35.00	\$18,893,210	\$2,196

- (1) Represents only the additional number of shares being registered and includes shares of common stock issuable upon exercise of the underwriters' option to purchase additional shares. Does not include the securities that the Registrant previously registered on the Registration Statement on Form S-1 (File No. 333-201439).
- (2) Based on the public offering price of \$35.00 per share.
- (3) The registration fee is calculated in accordance with Rule 457(a) under the Securities Act of 1933, as amended. The registrant previously registered securities at an aggregate offering price not to exceed \$119,083,790 on a Registration Statement on Form S-1 (File No. 333-201439), which was declared effective by the Securities and Exchange Commission on January 22, 2015. In accordance with Rule 462(b) under the Securities Act, an additional amount of securities having a proposed maximum aggregate offering price of \$18,893,210 is hereby registered, which includes shares issuable upon the exercise of the underwriters' option to purchase additional shares.

This registration statement shall become effective upon filing with the Commission in accordance with Rule 462(b) of the Securities Act of 1933, as amended.

EXPLANATORY NOTE AND INCORPORATION BY REFERENCE

This Registration Statement is being filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended (the "Securities Act"). The contents of Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-201439) filed by Zafgen, Inc. with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act, which was declared effective by the Commission on January 22, 2015, are incorporated by reference into this Registration Statement.

The required opinion and consents are listed on an Exhibit Index attached hereto and filed herewith.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the City of Boston, Commonwealth of Massachusetts, this 22nd day of January, 2015.

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, this registration statement has been signed by the following persons in the capacities and on the date indicated below.

<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)	January 22, 2015
<u>/s/ Patricia L. Allen</u> PATRICIA L. ALLEN	Chief Financial Officer (Principal Financial and Accounting Officer)	January 22, 2015
<u>*</u> PETER BARRETT, PH.D.	Chairman of the Board and Director	January 22, 2015
<u>*</u> BRUCE BOOTH, PH.D.	Director	January 22, 2015
<u>*</u> AVI GOLDBERG	Director	January 22, 2015
<u>*</u> FRANCES K. HELLER	Director	January 22, 2015
<u>*</u> JOHN L. LAMATTINA, PH.D.	Director	January 22, 2015
<u>*</u> KEVIN P. STARR	Director	January 22, 2015
<u>*</u> FRANK E. THOMAS	Director	January 22, 2015

* Pursuant to Power of Attorney

By: /s/ Thomas E. Hughes
Thomas E. Hughes, Ph.D.
Attorney-in-Fact

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
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

* Previously filed with the Registrant's Registration Statement on Form S-1, as amended (File No. 333-201439), filed with the SEC on January 16, 2015 and incorporated by reference herein

January 22, 2015

Zafgen, Inc.
175 Portland Street, 4th Floor
Boston, MA 02114

Re: Securities Registered under Registration Statement on Form S-1

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-1 (File No. 333-201439) (the "Initial Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act") and (ii) a second Registration Statement on Form S-1 filed pursuant to Rule 462(b) promulgated under the Securities Act (the "462(b) Registration Statement", and together with the Initial Registration Statement, the "Registration Statement"). This opinion letter is furnished to you in connection with your filing of the 462(b) Registration Statement, relating to the registration of the offering by Zafgen, Inc., a Delaware corporation (the "Company") of up to 539,806 shares (the "Shares") of the Company's Common Stock, \$0.001 par value per share, including Shares purchasable by the underwriters upon their exercise of an over-allotment option granted to the underwriters by the Company. The Shares are being sold to the several underwriters named in, and pursuant to, an underwriting agreement among the Company and such underwriters (the "Underwriting Agreement").

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 opinions 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).

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, when the price and other terms upon which the Shares are to be sold have been approved by the Board of Directors of the Company (or a duly authorized committee of the Board of Directors) and the Shares have been issued and delivered against payment in accordance with such terms, the Shares will be validly issued, fully paid and non-assessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the 462(b) Registration Statement and to the references to our firm under the caption "Legal Matters" in the Initial 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-1 of Zafgen, Inc., filed pursuant to Rule 462(b) of the Securities Act of 1933, of our report dated March 14, 2014, except for the second paragraph of Note 15, as to which the date is June 5, 2014, relating to the consolidated financial statements of Zafgen, Inc., which appears in Amendment No. 1 to the Registration Statement on Form S-1 (No. 333-201439). We also consent to the reference to us under the heading "Experts" in Amendment No. 1 to the Registration Statement on Form S-1 as incorporated by reference in this Registration Statement.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
January 21, 2015