

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

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

GlycoMimetics, Inc.
(Exact name of Registrant as specified in its charter)

Delaware
(State or other jurisdiction of Incorporation or organization)

06-1686563
(I.R.S. Employer Identification No.)

**9708 Medical Center Drive
Rockville, MD 20850**

(Address of principal executive offices) (Zip code)

**2013 Equity Incentive Plan
2013 Employee Stock Purchase Plan**

(Full title of the plan)

**Rachel K. King
Chief Executive Officer
GlycoMimetics, Inc.
9708 Medical Center Drive
Rockville, MD 20850
(240) 243-1201**

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

Copies to:

**Brent B. Siler
Christian E. Plaza
Brian F. Leaf
Cooley LLP
11951 Freedom Drive
Reston, VA 20190
Tel: (703) 456-8000
Fax: (703) 456-8100**

**Brian M. Hahn
Chief Financial Officer
GlycoMimetics, Inc.
9708 Medical Center Drive
Rockville, MD 20850
Tel: (240) 243-1201
Fax: (301) 738-2137**

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 Securities to be Registered	Amount to be Registered (1)	Proposed Maximum Offering Price Per Share (2)	Proposed Maximum Aggregate Offering Price (2)	Amount of Registration Fee
Common Stock, par value \$0.001 per share	762,008 shares	\$ 4.83	\$ 3,680,499	\$ 370.63

- (1) Pursuant to Rule 416(a) promulgated under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also cover any additional shares of the Registrant's Common Stock that become issuable under the 2013 Equity Incentive Plan (the "2013 EIP") and the 2013 Employee Stock Purchase Plan (the "2013 ESPP") set forth herein by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without receipt of consideration that increases the number of outstanding shares of the Registrant's Common Stock.
- (2) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(c) promulgated under the Securities Act. The proposed maximum offering price per share and the proposed maximum aggregate offering price are calculated using the average of the high and low prices of the Registrant's Common Stock as reported on the NASDAQ Global Market on February 24, 2016. The chart below details the calculations of the registration fee:

Securities	Number of Shares	Offering Price Per Share (2)	Aggregate Offering Price
Additional shares reserved for future grant under the 2013 EIP	571,506	\$ 4.83 (2)	\$ 2,760,374
Additional shares reserved for future grant under the 2013 ESPP	190,502	\$ 4.83 (2)	\$ 920,125
Proposed Maximum Aggregate Offering Price			\$ 3,680,499
Registration Fee			\$ 370.63

EXPLANATORY NOTE

This Registration Statement on Form S-8 is being filed for the purpose of registering an additional 762,008 shares of Common Stock of GlycoMimetics, Inc. to be issued pursuant to the 2013 EIP and 2013 ESPP.

PART II

ITEM 3. INCORPORATION OF DOCUMENTS BY REFERENCE

The contents of the earlier registration statement relating to the 2013 EIP and 2013 ESPP, previously filed with the Securities and Exchange Commission on January 10, 2014 (File No. 333-193317) are incorporated herein by reference and made a part of this Registration Statement.

ITEM 8. EXHIBITS

Exhibit Number	Description
4.1 (1)	Amended and Restated Certificate of Incorporation of the Registrant.
4.2 (2)	Amended and Restated Bylaws of the Registrant.
4.3 (3)	Specimen stock certificate evidencing shares of the Registrant's Common Stock.
4.4 (4)	2013 Equity Incentive Plan.
4.5 (5)	Form of Stock Option Grant Notice and Stock Option Agreement under 2013 Equity Incentive Plan.
4.6 (6)	Form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Agreement under 2013 Equity Incentive Plan.
4.7 (7)	2013 Employee Stock Purchase Plan.
5.1	Opinion of Cooley LLP.
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm.
23.2	Consent of Cooley LLP (included in Exhibit 5.1).
24.1	Power of Attorney (included on the signature page of this Form S-8).

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- (1) Previously filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K (File No. 001-36177), filed with the Commission on January 15, 2014, and incorporated by reference herein.
 - (2) Previously filed as Exhibit 3.2 to the Registrant's Current Report on Form 8-K (File No. 001-36177), filed with the Commission on January 15, 2014, and incorporated by reference herein.
 - (3) Previously filed as Exhibit 4.2 to Amendment No. 2 to the Registrant's Registration Statement on Form S-1 (File No. 333-191567), filed with the Commission on October 31, 2013, and incorporated by reference herein.
 - (4) Previously filed as Exhibit 10.11 to Amendment No. 1 to the Registrant's Registration Statement on Form S-1 (File No. 333-191567), filed with the Commission on October 28, 2013, and incorporated by reference herein.
 - (5) Previously filed as Exhibit 10.12 to Amendment No. 1 to the Registrant's Registration Statement on Form S-1 (File No. 333-191567), filed with the Commission on October 28, 2013, and incorporated by reference herein.
 - (6) Previously filed as Exhibit 10.13 to Amendment No. 1 to the Registrant's Registration Statement on Form S-1 (File No. 333-191567), filed with the Commission on October 28, 2013, and incorporated by reference herein.
 - (7) Previously filed as Exhibit 10.14 to Amendment No. 1 to the Registrant's Registration Statement on Form S-1 (File No. 333-191567), filed with the Commission on October 28, 2013, and incorporated by reference herein.
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ITEM 9. UNDERTAKINGS

1. The undersigned registrant hereby undertakes:

(a) 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.

(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)(i) and (a)(ii) 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 that are incorporated by reference in the registration statement.

(b) 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 herein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) 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.

(d) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

2. 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 herein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.
3. 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.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, 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 Gaithersburg, State of Maryland, on this 29th day of February, 2016.

GlycoMimetics, Inc.

- By: /s/ Rachel K. King
Rachel K. King
President and Chief Executive Officer

POWER OF ATTORNEY

Know All Persons By These Presents, that each person whose signature appears below constitutes and appoints Rachel K. King, Brian Hahn and Brent B. Siler, and each or any one of them, his or her true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, 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 attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

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 and on the dates indicated.

Signature	Title	Date
/s/ Rachel K. King	President, Chief Executive Officer and Director	February 29, 2016
Rachel K. King	<i>(Principal Executive Officer)</i>	
/s/ Brian M. Hahn	Chief Financial Officer	February 29, 2016
Brian M. Hahn	<i>(Principal Financial Officer and Principal Accounting Officer)</i>	
/s/ John J. Baldwin, Ph.D.	Director	February 29, 2016
John J. Baldwin, Ph.D.		
/s/ M. James Barrett, Ph.D.	Director	February 29, 2016
M. James Barrett, Ph.D.		
/s/ John L. Magnani, Ph.D.	Director	February 29, 2016
John L. Magnani, Ph.D.		
/s/ Franklin H. Top, Jr., M.D.	Director	February 29, 2016
Franklin H. Top, Jr., M.D.		
/s/ Timothy Pearson	Director	February 29, 2016
Timothy Pearson		
/s/ Mark A. Goldberg, M.D.	Director	February 29, 2016
Mark A. Goldberg M.D.		

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Brian F. Leaf
(703) 456-8053
bleaf@cooley.com

February 29, 2016

GlycoMimetics, Inc.
9708 Medical Center Drive
Rockville, Maryland 20850

Ladies and Gentlemen:

We have represented GlycoMimetics, Inc., a Delaware corporation (the "**Company**"), in connection with the filing by the Company of a Registration Statement on Form S-8 (the "**Registration Statement**") with the Securities and Exchange Commission covering the offering of up to (i) 571,506 shares (the "**2013 EIP Shares**") of the Company's common stock, par value \$0.001 per share ("**Common Stock**"), pursuant to the Company's 2013 Equity Incentive Plan (the "**2013 EIP**") and (ii) 190,502 shares (together with the 2013 EIP Shares, the "**Shares**") of the Common Stock pursuant to the Company's 2013 Employee Stock Purchase Plan (together with the 2013 EIP, the "**Plans**").

In connection with this opinion, we have examined and relied upon (a) the Registration Statement and the related prospectuses, (b) the Company's Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws, each as currently in effect, (c) the Plans and (d) the originals or copies certified to our satisfaction of such records, documents, certificates, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. We have assumed the genuineness and authenticity of all documents submitted to us as originals, and the conformity to originals of all documents submitted to us as copies thereof. As to certain factual matters, we have relied upon a certificate of officers of the Company and have not sought to independently verify such matters.

Our opinion is expressed only with respect to the General Corporation Law of the State of Delaware. We express no opinion as to whether the laws of any particular jurisdiction other than those identified above are applicable to the subject matter of this opinion. We are not rendering any opinion as to compliance with any federal or state antifraud law, rule or regulation relating to securities, or to the sale or issuance thereof.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the Shares, when sold and issued in accordance with the Plans, the Registration Statement and the related prospectuses, will be validly issued, fully paid and nonassessable, (except as to shares issued pursuant to certain deferred payment arrangements, which will be fully paid and nonassessable when such deferred payments are made in full).

We consent to the filing of this opinion as an exhibit to the Registration Statement.

Sincerely,

Cooley LLP

By: /s/ Brian F. Leaf

Brian F. Leaf

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statement (Form S-8), filed on February 29, 2016, pertaining to the 2013 Equity Incentive Plan and 2013 Employee Stock Purchase Plan of GlycoMimetics, Inc. of our report dated February 29, 2016, with respect to the financial statements of GlycoMimetics, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2015, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

McLean, Virginia
February 29, 2016
