

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

**POST-EFFECTIVE AMENDMENT NO. 1
TO
FORM S-1
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)

2834
(Primary Standard Industrial
Classification Code Number)
401 Professional Drive, Suite 250
Gaithersburg, MD 20879
(240) 243-1201

06-1686563
(I.R.S. Employer
Identification Number)

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

Rachel K. King
Chief Executive Officer
GlycoMimetics, Inc.
401 Professional Drive, Suite 250
Gaithersburg, MD 20879
(240) 243-1201

(Name, address, including zip code, and 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
Telephone: (703) 456-8000
Fax: (703) 456-8100

Divakar Gupta
Cheston J. Larson
Latham & Watkins LLP
12636 High Bluff Drive, Suite 400
San Diego, CA 92130
Telephone: (858) 523-5400
Fax: (858) 523-5450

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this registration statement.

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.

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 number of the earlier effective registration statement for the same offering. File No. 333-191567

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 under the Securities Exchange Act of 1934. (Check one):

Large accelerated filer
Non-accelerated filer

Accelerated filer
Smaller reporting company

This Registration Statement shall become effective upon filing in accordance with Rule 462(d) under the Securities Act of 1933.

EXPLANATORY NOTE

This Post-Effective Amendment No. 1 to the Registration Statement on Form S-1 (File No. 333-191567) is filed pursuant to Rule 462(d) solely to add an updated Exhibit 5.1 with respect to such Registration Statement.

PART II
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 16. Exhibits and Financial Statement Schedules.

The exhibits to the Registration Statement are listed in the Exhibit Index attached hereto and are incorporated by reference herein.

SIGNATURES

Pursuant to the requirements of the Securities Act, the Registrant has duly caused this Post-Effective Amendment No. 1 to Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Gaithersburg, State of Maryland, on the 10th day of January, 2014.

GLYCOMIMETICS, INC.

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

Pursuant to the requirements of the Securities Act, this Post-Effective Amendment No. 1 to Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

SIGNATURE	TITLE	DATE
<u>/s/ Rachel K. King</u> Rachel K. King	President, Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	January 10, 2014
<u>/s/ Brian M. Hahn</u> Brian M. Hahn	Chief Financial Officer <i>(Principal Financial Officer and Principal Accounting Officer)</i>	January 10, 2014
*		
<u>John J. Baldwin, Ph.D.</u>	Director	January 10, 2014
*		
<u>M. James Barrett, Ph.D.</u>	Director	January 10, 2014
*		
<u>William M. Gust</u>	Director	January 10, 2014
*		
<u>Michael A. Henos</u>	Director	January 10, 2014
*		
<u>John L. Magnani, Ph.D.</u>	Director	January 10, 2014
*		
<u>Franklin H. Top, Jr., M.D.</u>	Director	January 10, 2014

* By: /s/ Brian M. Hahn
Brian M. Hahn
Attorney-in-fact

EXHIBIT INDEX

EXHIBIT NUMBER	DESCRIPTION OF DOCUMENT
1.1 [^]	Form of Underwriting Agreement.
3.1 [^]	Amended and Restated Certificate of Incorporation, as currently in effect.
3.2 [^]	Certificate of Amendment of Restated Certificate of Incorporation.
3.3 [^]	Form of Amended and Restated Certificate of Incorporation to be effective upon the completion of this offering.
3.4 [^]	Amended and Restated Bylaws, as currently in effect.
3.5 [^]	Form of Amended and Restated Bylaws to be effective upon completion of this offering.
4.1	Reference is made to exhibits 3.1 through 3.5.
4.2 [^]	Specimen stock certificate evidencing shares of Common Stock.
5.1	Opinion of Cooley LLP as to legality.
10.1 ^{*^}	License Agreement, dated as of October 7, 2011, as amended to date, by and between the Registrant and Pfizer Inc.
10.2 [^]	Second Amended and Restated Investor Rights Agreement, dated as of October 20, 2009, by and among the Registrant and certain of its stockholders.
10.3 [^]	Lease Agreement, dated as of July 1, 2010, as amended through December 6, 2011, by and between the Registrant and ARE-QRS Corp.
10.4 [^]	Warrant Issued to Silicon Valley Bank, dated October 12, 2006.
10.5 [^]	Form of Common Stock Warrant issued in December 2005 bridge financing.
10.6 [^]	Form of Common Stock Warrant issued in July 2008 bridge financing.
10.7 [^]	Form of Common Stock Warrant issued in January 2009 bridge financing.
10.8+ [^]	2003 Stock Incentive Plan, as amended to date.
10.9+ [^]	Form of Incentive Stock Option Agreement under 2003 Stock Incentive Plan.
10.10+ [^]	Form of Nonqualified Stock Option Agreement under 2003 Stock Incentive Plan.
10.11+ [^]	2013 Equity Incentive Plan.
10.12+ [^]	Form of Stock Option Grant Notice and Stock Option Agreement under 2013 Equity Incentive Plan.
10.13+ [^]	Form of Restricted Stock Unit Grant Notice and Restricted Stock Unit Award Agreement under 2013 Equity Incentive Plan.
10.14+ [^]	2013 Employee Stock Purchase Plan.
10.15+ [^]	Form of Indemnification Agreement.
10.16+ [^]	Form of Employment Agreement with executive officers to be in effect upon the completion of this offering.
10.17 [^]	Form of Non-Employee Director Compensation Policy to be in effect upon the completion of this offering.
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. See page II-4 to the Registration Statement on Form S-1 (No. 333-191567) filed with the Securities and Exchange Commission on October 4, 2013.

[^] Previously filed.

+ Indicates management contract or compensatory plan.

* Portions of this exhibit, indicated by asterisks, have been omitted pursuant to a request for confidential treatment and have been separately filed with the Securities and Exchange Commission.



Brent B. Siler
T: +1 703 456 8058
bsiler@cooley.com

January 9, 2014

GlycoMimetics, Inc.
401 Professional Drive, Suite 250
Gaithersburg, Maryland 20879

Ladies and Gentlemen:

You have requested our opinion with respect to certain matters in connection with the filing by GlycoMimetics, Inc., a Delaware corporation (the "**Company**") of a Registration Statement (No. 333-191567) on Form S-1 (the "**Registration Statement**") with the Securities and Exchange Commission, including a related prospectus filed with the Registration Statement (the "**Prospectus**"), covering an underwritten public offering of up to 8,050,000 shares of common stock (the "**Shares**"), including 1,050,000 shares for which the underwriters have been granted an option to purchase.

In connection with this opinion, we have examined and relied upon (a) the Registration Statement and related Prospectus, (b) the Company's Amended and Restated Certificate of Incorporation, as amended to date and as currently in effect, filed as Exhibits 3.1 and 3.2 to the Registration Statement, (c) the Company's Bylaws, as amended to date and as currently in effect, filed as Exhibit 3.4 to the Registration Statement, (d) the Company's Amended and Restated Certificate of Incorporation, filed as Exhibit 3.3 to the Registration Statement, which will be in effect upon the closing of the offering contemplated by the Registration Statement, (e) the Company's Amended and Restated Bylaws, filed as Exhibit 3.5 to the Registration Statement, which will be in effect upon the closing of the offering contemplated by the Registration Statement, and (f) 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 where due execution and delivery are a prerequisite to the effectiveness 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.

On the basis of the foregoing, and in reliance thereon, we are of the opinion that the Shares have been duly authorized by the Company and, when sold and issued in accordance with the Registration Statement and the related Prospectus, will be validly issued, fully paid and non-assessable.

We consent to the reference to our firm under the caption "Legal Matters" in the Prospectus included in the Registration Statement and to the filing of this opinion as an exhibit to the Registration Statement.

Sincerely,

COOLEY LLP

By: /s/ Brent B. Siler
Brent B. Siler