

Filed Pursuant to Rule 424(b)(3)
Registration Statement No. 333-180562
September 12, 2012

PROSPECTUS SUPPLEMENT NO. 4

SYNTHETIC BIOLOGICS, INC.

112,573 Shares of Common Stock

This prospectus supplement amends and supplements our prospectus, dated July 26, 2012 relating to the resale, from time to time, of up to 112,573 shares of common stock of Synthetic Biologics, Inc. upon the exercise of warrants issued in July 2011 at an exercise price of \$1.00 per share and warrants sold in our July 2010 offering at an exercise price of \$1.32 per share. We will receive proceeds if the warrants are exercised for cash; to the extent we receive such proceeds, they will be used for working capital purposes.

Our common stock became eligible for trading on the NYSE MKT October 16, 2008. Our common stock is eligible for quotation on the NYSE MKT under the symbol "SYN". The closing price of our stock on September 11, 2012 was \$2.08.

This prospectus supplement is being filed to include the information set forth in the Current Report on Form 10Q/A filed on September 11, 2012, which is set forth below. This prospectus supplement should be read in conjunction with the prospectus dated July 26, 2012, supplement no. 1 dated August 9, 2012, prospectus supplement no. 2 dated August 15, 2012, and prospectus supplement no. 3 dated August 15, 2012 which are to be delivered with this prospectus supplement.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page 4 of the original prospectus for more information.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus or the prospectus to which it relates is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this Prospectus Supplement No. 4 is September 12, 2012.

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-Q/A
Amendment No. 1

(Mark One)

☒ QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended June 30, 2012

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES ACT OF 1934

For the transition period from _____ to _____

Commission File Number: 1-12584

SYNTHETIC BIOLOGICS, INC.
(Name of small business issuer in its charter)

Nevada
(State or other jurisdiction of incorporation or organization)

13-3808303
(IRS Employer Identification Number)

617 Detroit Street, Suite 100
Ann Arbor, MI
(Address of principal executive offices)

48104
(Zip Code)

Registrant's telephone number, including area code:
(734) 332-7800

Securities registered pursuant to Section 12(b) of the Act:
Common Stock, \$0.001 par value per share

Securities registered pursuant to Section 12(g) of the Act:
None.

(Title of Class)

Indicate by check mark whether the issuer: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

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. (Check one):

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-Accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>

(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of August 9, 2012, the registrant had 33,395,538 shares of common stock outstanding.

Explanatory Note

Synthetic Biologics, Inc. (the "Company") is filing this Amendment No. 1 on Form 10-Q/A (the "Amendment") to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2012 (the "Form 10-Q"), filed with the Securities and Exchange Commission on August 14, 2012 (the "Original Filing Date"), for the sole purpose of furnishing Exhibit 101 to the Form 10-Q in accordance with Rule 405 of Regulation S-T. Exhibit 101 consists of the following materials from the Form 10-Q, formatted in XBRL (eXtensible Business Reporting Language):

101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Schema
101.CAL	XBRL Taxonomy Calculation Linkbase
101.DEF	XBRL Taxonomy Definition Linkbase
101.LAB	XBRL Taxonomy Label Linkbase
101.PRE	XBRL Taxonomy Presentation Linkbase

No other changes have been made to the Form 10-Q. This Amendment speaks as of the Original Filing Date, does not reflect events that may have occurred subsequent to the Original Filing Date, and does not modify or update in any way disclosures made in the Form 10-Q.

Pursuant to Rule 406T of Regulation S-T, the interactive data files attached as Exhibit 101 hereto are deemed not filed or part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, as amended, are deemed not filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and otherwise are not subject to liability under those sections.

Item 6. Exhibits

Exhibit Number	Exhibit Title
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31.1*	Certification of Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2*	Certification of Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1*	Certification of Chief Executive Officer pursuant to 18 U.S.C Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2*	Certification of Chief Financial Officer pursuant to 18 U.S.C Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS**	XBRL Instance Document
101.SCH**	XBRL Taxonomy Schema
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101.LAB**	XBRL Taxonomy Label Linkbase
101.PRE**	XBRL Taxonomy Presentation Linkbase

* Previously filed as an exhibit to the Company's Form 10-Q for the period ended June 30, 2012 filed with the Securities and Exchange Commission on August 14, 2012.

** Furnished herewith. XBRL (eXtensible Business Reporting Language) information is furnished and not filed or a part of a registration statement or prospectus for purposes of Sections 11 or 12 of the Securities Act of 1933, as amended, is deemed not filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and otherwise is not subject to liability under these sections.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned.

SYNTHETIC BIOLOGICS, INC.

By: /s/ Jeffrey Riley
Jeffrey Riley
President and Chief Executive Officer
(Principal Executive Officer)
Date: September 11, 2012

By: /s/ C. Evan Ballantyne
C. Evan Ballantyne
Chief Financial Officer
(Principal Financial Officer)
Date: September 11, 2012
