

Synthetic Biologics, Inc.  
Form 424B3  
October 17, 2012

**Filed Pursuant to Rule 424(b)(3)**

**Registration Statement No. 333-180562**

**October 17, 2012**

**PROSPECTUS SUPPLEMENT NO. 6**

**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 October 16, 2012 was \$2.15.

This prospectus supplement is being filed to include the information set forth in the Current Report on Form 8-K filed on October 17, 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, prospectus supplement no. 3 dated August 15, 2012, prospectus supplement no. 4 dated September 12, 2012, and prospectus supplement no. 5 dated October 9, 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. 6 is October 17, 2012.

**UNITED STATES**

**SECURITIES AND EXCHANGE COMMISSION**

**WASHINGTON, D.C. 20549**

**FORM 8-K**

**CURRENT REPORT**

**Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

Date of Report (date of earliest event reported): **October 16, 2012**

**Synthetic Biologics, Inc.**

(Exact name of registrant as specified in charter)

**Nevada**

(State or other jurisdiction of incorporation)

01-12584

13-3808303

(Commission File Number) (IRS Employer Identification No.)

**617 Detroit Street, Suite 100**

**Ann Arbor, MI 48104**

(Address of principal executive offices and zip code)

**(734) 332-7800**

(Registrant's telephone number including area code)

**N/A**

(Former Name and Former Address)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of registrant under any of the following provisions:

Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

Soliciting material pursuant to Rule 14a-12(b) under the Exchange Act (17 CFR 240.14a-12)

Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 3.02 Unregistered Sales of Equity Securities.

On October 16, 2012 a closing was held for the transaction previously announced on August 8, 2012 between Synthetic Biologics, Inc. (the “Company”) and Intrexon Corporation (“Intrexon”). The Company issued 3,552,210 shares of Company common stock (the “Shares”) at a purchase price equal to the \$0.001 par value of such shares, which issuance is also deemed paid in partial consideration for the execution and delivery of the Exclusive Channel Collaboration Agreement, dated August 6, 2012, between the Company and Intrexon. The offer and issuance of the Shares have not been registered under the Securities Act of 1933, as amended (the “Securities Act”), and therefore may not be offered or sold in the United States absent registration or an applicable exemption from registration requirements. For this issuance, the Company is relying on the exemption from federal registration under Section 4(2) of the Securities Act, based on the Company’s belief that the offer and sale of the Shares does not involve a public offering as Intrexon is an “accredited investor” as defined under Section 501 promulgated under the Securities Act and no general solicitation has been involved in the offering.

Item 8.01 Other Events.

On October 16, 2012, the Company completed the closing of its Exclusive Channel Collaboration transaction with Intrexon, which was previously announced in the Company’s press release on August 8, 2012. The Company intends to use specified patents and other intellectual property of Intrexon in connection with the research, development, use, importing, manufacture, sale, and offer for sale of monoclonal antibody therapies for the treatment of eight specific target infectious disease indications (the “Field”). Initially, the Company’s development efforts will target three infectious diseases within the Field. Pursuant to the terms of the Stock Purchase Agreement between the Company and Intrexon dated August 6, 2012, the Company met all of the requisite closing conditions, including the receipt of NYSE MKT approval, and has issued the Shares to Intrexon, which issuance is deemed paid in partial consideration for the execution and delivery of the Exclusive Channel Collaboration Agreement, dated August 6, 2012, between the Company and Intrexon. Stockholder approval of such issuance was obtained at the Company’s Annual Meeting of Stockholders held on October 5, 2012.

In connection with the transactions contemplated by the Stock Issuance Agreement, and pursuant to the First Amendment to Registration Rights Agreement, the Company agreed to file a “resale” registration statement (the “Registration Statement”) registering the resale of the shares issued and to be issued under the Stock Issuance Agreement. None of the shares to be issued under the Stock Issuance Agreement need to be registered until April 30, 2013. Under that agreement, the Company will be obligated to use its reasonable best efforts to cause the “resale” registration statement to be declared effective as promptly as practicable after filing and to maintain the effectiveness of the registration statement until all securities therein are sold or are otherwise can be sold pursuant to Rule 144, without any restrictions.

**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 hereunto duly authorized.

Dated: October 17, 2012

SYNTHETIC  
BIOLOGICS, INC.  
(Registrant)

By: /s/ Jeffrey Riley  
Name: Jeffrey Riley  
Title: President  
and Chief Executive  
Officer