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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, DC 20549

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SCHEDULE 13D

(Amendment No. 4)\*  
Under the Securities Exchange Act of 1934

SYNTHETIC BIOLOGICS, INC.

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(Name of Issuer)

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Common Stock, par value \$0.001 per share

(Title of Class of Securities)

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87163U102

(CUSIP Number)

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Third Security, LLC  
1881 Grove Avenue  
Radford, Virginia 24141  
Attention: Marcus E. Smith, Esq.  
(540) 633-7900

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(Name, Address and Telephone Number of Person  
Authorized to Receive Notices and Communications)

Copy to:  
Intrexon Corporation  
Attention: Legal  
20374 Seneca Meadows Parkway  
Germantown, Maryland 20876  
(301) 556-9809

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September 2, 2015

(Date of Event which Requires Filing of this Statement)

If the filing person has previously filed a statement on Schedule 13G to report the acquisition which is the subject of this Schedule 13D, and is filing this schedule because of Rule 13d-1(b)(3) or (4), check the following box ☐.

NOTE: Schedules filed in paper format shall include a signed original and five copies of the schedule, including all exhibits. See §240.13d-7 for other parties to whom copies are to be sent.

\* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).


1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS RANDAL J. KIRK		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	SOURCE OF FUNDS PF		
5	CHECK BOX IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(D) OR 2(E) <input type="checkbox"/>		
6	CITIZENSHIP OR PLACE OF ORGANIZATION United States		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	7	SOLE VOTING POWER 3,625,000	
	8	SHARED VOTING POWER 9,613,268	
	9	SOLE DISPOSITIVE POWER 3,625,000	
	10	SHARED DISPOSITIVE POWER 9,613,268	
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 13,238,268		
12	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES <input type="checkbox"/>		
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (11) 14.6%		
14	TYPE OF REPORTING PERSON IN		

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS  THIRD SECURITY, LLC I.R.S. IDENTIFICATION NO.: 54-1923091		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	SOURCE OF FUNDS WC		
5	CHECK BOX IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(D) OR 2(E) <input type="checkbox"/>		
6	CITIZENSHIP OR PLACE OF ORGANIZATION Virginia		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	7	SOLE VOTING POWER 3,625,000	
	8	SHARED VOTING POWER 0	
	9	SOLE DISPOSITIVE POWER 3,625,000	
	10	SHARED DISPOSITIVE POWER 0	
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 3,625,000		
12	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES <input type="checkbox"/>		
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (11) 4.0%		
14	TYPE OF REPORTING PERSON OO – limited liability company		

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS  NRM VII HOLDINGS I, LLC I.R.S. IDENTIFICATION NO.: 27-1471440		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	SOURCE OF FUNDS (SEE INSTRUCTIONS) WC		
5	CHECK BOX IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(D) OR 2(E) <input type="checkbox"/>		
6	CITIZENSHIP OR PLACE OF ORGANIZATION United States		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	7	SOLE VOTING POWER 3,625,000	
	8	SHARED VOTING POWER 0	
	9	SOLE DISPOSITIVE POWER 3,625,000	
	10	SHARED DISPOSITIVE POWER 0	
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 3,625,000		
12	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES <input type="checkbox"/>		
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (11) 4.0%		
14	TYPE OF REPORTING PERSON OO – Limited Liability Company		

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS  INTREXON CORPORATION I.R.S. IDENTIFICATION NO.: 26-0084895		
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>		
3	SEC USE ONLY		
4	SOURCE OF FUNDS WC		
5	CHECK BOX IF DISCLOSURE OF LEGAL PROCEEDINGS IS REQUIRED PURSUANT TO ITEM 2(D) OR 2(E) <input type="checkbox"/>		
6	CITIZENSHIP OR PLACE OF ORGANIZATION Virginia		
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	7	SOLE VOTING POWER 0	
	8	SHARED VOTING POWER 9,613,268	
	9	SOLE DISPOSITIVE POWER 0	
	10	SHARED DISPOSITIVE POWER 9,613,268	
11	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 9,613,268		
12	CHECK BOX IF THE AGGREGATE AMOUNT IN ROW (11) EXCLUDES CERTAIN SHARES <input type="checkbox"/>		
13	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (11) 10.6%		
14	TYPE OF REPORTING PERSON CO		

This Amendment No. 4 (the "Amendment") amends and supplements the Statement on Schedule 13D, dated December 7, 2011 and filed on December 12, 2011 as amended by Amendment No. 1 dated October 16, 2012 and filed on October 19, 2012, as amended by Amendment No. 2 dated October 29, 2012 and filed on November 1, 2012 and as amended by Amendment No. 3 dated December 17, 2013 and filed December 19, 2013 (the "Original Schedule 13D"), relating to the Common Stock, par value \$0.001 per share (the "Common Stock"), of Synthetic Biologics, Inc. a Nevada corporation (the "Company"). Mr. Randal J. Kirk ("Mr. Kirk"), NRM VII Holdings I, LLC ("NRM VII Holdings"), a Virginia limited liability company that is managed by an affiliate that is managed by Third Security, LLC ("Third Security"), a Virginia limited liability company that is managed by Mr. Kirk, and Intrexon Corporation, a Virginia corporation ("Intrexon" and, together with Mr. Kirk, NRM VII Holdings and Third Security, the "Reporting Persons"), are filing this Amendment to disclose the acquisition by Intrexon of 937,500 shares of Common Stock received in connection with a Stock Issuance Agreement, dated August 10, 2015 between the Company and Intrexon (as further described below). Mr. Kirk could be deemed to have indirect beneficial ownership of the shares of Common Stock directly beneficially owned by NRM VII Holdings and Intrexon.

Except as set forth below, there are no changes to the information set forth in the Original Schedule 13D.

Item 3. Source and Amount of Funds or Other Consideration.

Item 3 of the Original Schedule 13D is hereby amended and supplemented as follows:

On August 10, 2015, the Company expanded its relationship with Intrexon and entered into an Exclusive Channel Collaboration Agreement (the "Channel Agreement") with Intrexon that governs a "channel collaboration" arrangement in which the Company will use Intrexon's technology for development of biotherapeutic products (a "Collaboration Product") for the treatment of phenylketonuria (PKU) in humans by direct administration of a viral construct containing a gene to alter genetic expression of phenylalanine hydroxylase and/or administration of genetically modified bacteria that express an effector directed to the metabolic conversion of phenylalanine (the "Field"). The Channel Agreement establishes committees comprised of Company and Intrexon representatives that will initially govern activities related to the collaboration in the areas of project establishment and intellectual property and optionally, chemistry, clinical and regulatory matters and commercialization efforts.

The Channel Agreement grants the Company a worldwide exclusive license to use the patents and other intellectual property of Intrexon in connection with the research, development, use, importing, manufacture, sale, and offer for sale of Collaboration Products in the Field. Such license is exclusive to both parties within the Field, and otherwise is non-exclusive. The Company may not sublicense the rights described without Intrexon's written consent other than under limited circumstances to third party contractors performing contract manufacturing services or in the case of certain late stage clinical product candidates.

Under the Channel Agreement, and subject to certain exceptions, the Company is responsible for, among other things, the development, commercialization and manufacturing of products.

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The Company agreed to pay Intrexon a technology access fee by the issuance of 937,500 shares of its Common Stock having a value equal to \$3 million as of August 7, 2015 within ten days of approval of the issuance by the NYSE MKT. These shares were issued on September 2, 2015, upon satisfaction of customary closing conditions, including the approval for the listing on the NYSE MKT.

Item 4. Purpose of Transaction.

Item 4 of the Original Schedule 13D is hereby amended and supplemented as follows:

Intrexon acquired the shares disclosed hereunder for investment purposes and as partial consideration for the execution and delivery of the Channel Agreement.

Item 5. Interest in Securities of the Issuer.

Items 5(a) and (b) of the Original Schedule 13D are hereby amended and restated to read in its entirety as follows:

(a) and (b) See Items 11 and 13 of the cover pages to this Statement for the aggregate number of shares and percentage of issued and outstanding shares of Common Stock of the Company owned by the Reporting Persons. The percentage ownership is calculated based on 88,515,086 shares of Common Stock outstanding as of August 6, 2015 as disclosed in the Company's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2015 and filed on August 10, 2015, increased by the number of shares issued (i) by the Company on August 31, 2015 as disclosed in the Company's filing of Form 8-K on September 3, 2015 and (ii) to and purchased by Intrexon in partial consideration for the execution of the Channel Agreement.

Reporting Person	Amount of Common Stock Beneficially Owned	Percent of Class	Sole Power to Vote or Direct the Vote	Shared Power to Vote or Direct the Vote	Sole Power to Dispose or to Direct the Disposition	Shared Power to Dispose or to Direct the Disposition
Randal J. Kirk	13,238,268	14.6%	3,625,000	9,613,268	3,625,000	9,613,268
Third Security, LLC	3,625,000	4.0%	3,625,000	—	3,625,000	—
NRM VII Holdings I, LLC	3,625,000	4.0%	3,625,000	—	3,625,000	—
Intrexon Corporation	9,613,268	10.6%	—	9,613,268	—	9,613,268

Mr. Kirk could be deemed to have indirect beneficial ownership of the shares of Common Stock directly beneficially owned by NRM VII Holdings and Intrexon.

Item 6. Contracts, Arrangements, Understandings or Relationships with Respect to Securities of the Issuer.

The Reporting Persons' responses to Items 3 and 4 are incorporated herein by reference.



Item 7. Material to be Filed as Exhibits.

Exhibit 1 Stock Issuance Agreement between the Company and Intrexon dated August 10, 2015 (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, dated and filed August 10, 2015 and incorporated herein by reference)

Exhibit 2 Joint Filing Agreement, dated as of September 4, 2015, by and among Mr. Kirk, Third Security, NRM VII Holdings and Intrexon

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SIGNATURES

After reasonable inquiry and to the best of their knowledge and belief, the undersigned certify that the information set forth in this statement is true, complete and correct.

Date: September 4, 2015

/s/ Randal J. Kirk

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Randal J. Kirk

THIRD SECURITY, LLC

By: /s/ Randal J. Kirk

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Randal J. Kirk  
Manager

NRM VII HOLDINGS I, LLC

By: /s/ Randal J. Kirk

\_\_\_\_\_  
Randal J. Kirk  
Manager

INTREXON CORPORATION

By: /s/ Randal J. Kirk

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Randal J. Kirk  
Chief Executive Officer

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## EXHIBIT INDEX

Exhibit 1 Stock Issuance Agreement between the Company and Intrexon dated August 10, 2015 (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, dated and filed August 10, 2015 and incorporated herein by reference)

[Exhibit 2](#) Joint Filing Agreement, dated as of September 4, 2015, by and among Mr. Kirk, Third Security, NRM VII Holdings and Intrexon

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