

Synthetic Biologics, Inc.
Form 424B3
November 01, 2012

Filed Pursuant to Rule 424(b)(3)

Registration Statement No. 333-180562

November 1, 2012

PROSPECTUS SUPPLEMENT NO. 7

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 31, 2012 was \$2.43.

This prospectus supplement is being filed to include the information set forth in the Current Report on Form 8-K filed on October 31, 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, prospectus supplement no. 5 dated October 9, 2012, and prospectus supplement no. 6 dated October 17, 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. 7 is November 1, 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 25, 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 4810

(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 1.01 Entry into a Material Definitive Agreement.

On October 25, 2012, Synthetic Biologics, Inc. (the “Company”) entered into a Stock Purchase Agreement (the “Purchase Agreement”) with certain accredited investors (the “Purchasers”), pursuant to which the Company agreed to sell to the Purchasers in a private placement an aggregate of 6,750,000 shares of the Company’s Common Stock at a price per share of \$1.60 (the “Common Shares”) for aggregate gross proceeds of \$10,800,000 (the “Offering”). On October 30, 2012, the Company completed the Offering. The Company intends to use the net proceeds from the Offering to develop its monoclonal antibody and synthetic DNA programs through its Exclusive Channel Collaborations with Intrexon Corporation, and for general corporate purposes, including the execution of its business plan and expansion of its pipeline.

In connection with the Offering, the Company also entered into a registration rights agreement with certain of the Purchasers (the “Registration Rights Agreement”). The Registration Rights Agreement requires that the Company file a registration statement (the “Initial Registration Statement”) with the Securities and Exchange Commission (the “SEC”) within forty-five (45) days of the closing date of the Offering (the “Filing Date”) for the resale by the Purchasers of all of the Common Shares owned by such Purchasers and all shares of Common Stock issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect thereto (the “Registrable Securities”). The Initial Registration Statement must be declared effective by the SEC within ninety (90) days of the closing date of the Offering (the “Effectiveness Date”) subject to certain adjustments. Upon the occurrence of certain events (each an “Event”), including, but not limited to, that the Initial Registration Statement is not filed prior to the Filing Date, the Company will be required to pay to each of the Purchasers liquidated damages of 1.5% of their aggregate purchase price upon the date of the Event and then monthly thereafter until the Event is cured. In no event will the aggregate amount of liquidated damages payable to each of the Purchasers exceed in the aggregate 10% of the aggregate purchase price paid by such Purchaser for the Registrable Securities.

In connection with the Offering, the Company also entered into an agreement with a certain Purchaser that is an affiliate of Intrexon Corporation (the “Joinder Agreement”) pursuant to which such Purchaser agreed to be bound by the terms of and join Intrexon Corporation as a party to its registration rights agreement with the Company entered into in connection with the Exclusive Channel Collaboration Agreement between the Company and Intrexon Corporation dated August 6, 2012.

Griffin Securities, Inc. (the “Placement Agent”) served as the placement agent for the Offering. In consideration for services rendered as the Placement Agent in the Offering, the Company agreed to (i) pay to the Placement Agent cash commissions equal to 6.0% of the gross proceeds received in the Offering, (ii) issue to the Placement Agent, or its designee, a five-year warrant to purchase up to 635,855 shares of the Company’s Common Stock with an exercise price of \$1.60 per share (the “Placement Agent Warrant”) and (iii) reimburse the Placement Agent for its reasonable actual out-of-pocket expenses incurred in connection with the Offering, including reasonable legal fees and disbursements. The Placement Agent Warrant also provides for the same registration rights and obligations, and is subject to certain limitations, as set forth in the Registration Rights Agreement with respect to the Common Shares underlying such warrant.

The foregoing descriptions of the Purchase Agreement, Registration Rights Agreement, Joinder Agreement, and Placement Agent Warrant (collectively, the “Transaction Documents”) do not purport to be complete and are qualified in their entirety by reference to the full text of the Purchase Agreement, Registration Rights Agreement, Joinder Agreement, and form of Placement Agent Warrant, which are filed as Exhibit 10.1, Exhibit 10.2, Exhibit 10.3, and Exhibit 10.4, respectively, to this Current Report on Form 8-K and incorporated herein by reference.

On October 31, 2012, the Company issued the press release attached hereto as Exhibit 99.1 regarding the Offering described herein.

Important Notice regarding the Transaction Documents

The Transaction Documents have been included as exhibits to this Form 8-K to provide investors and security holders with information regarding their terms. They are not intended to provide any other financial information about the Company or its subsidiaries. The representations, warranties and covenants contained in the Transaction Documents were made only for purposes of those agreements and as of specific dates; were solely for the benefit of the parties to the Transaction Documents; may be subject to limitations agreed upon by the parties, including being qualified by disclosures made for the purposes of allocating contractual risk between the parties to the Transaction Documents instead of establishing these matters as facts; and may be subject to standards of materiality applicable to the contracting parties that differ from those applicable to investors. Investors should not rely on the representations, warranties and covenants or any description thereof as characterizations of the actual state of facts or condition of the Company. Moreover, information concerning the subject matter of the representations, warranties and covenants may change after the date of the Transaction Documents, which subsequent information may or may not be fully reflected in public disclosures by the Company.

Item 3.02 Unregistered Sales of Equity Securities.

The information contained in Item 1.01 is hereby incorporated by reference. Pursuant to the Offering, on October 30, 2012, the Company offered and sold the Common Shares to the Purchasers who represented that each was an “accredited investor” as such term is defined in the Securities Act of 1933, as amended (the “Securities Act”) in reliance on the exemption from registration afforded by Section 4(2) and Regulation D (Rule 506) under the Securities Act and corresponding provisions of state securities laws.

The Placement Agent Warrant (including the shares of the Company’s Common Stock underlying such warrant) was offered and sold to the Placement Agent in reliance on the exemption from registration afforded by Section 4(2) of the Securities Act and corresponding provisions of state securities laws. The Placement Agent represented that it was an “accredited investor” as such term is defined in the Securities Act.

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Accordingly, the Common Shares issued in the Offering and the Placement Agent Warrant (including the shares of the Company's Common Stock underlying such warrant) have not been registered under the Securities Act, and until registered, these securities may not be offered or sold in the United States absent registration or availability of an applicable exemption from registration. Neither this Current Report on Form 8-K, nor the exhibits attached hereto is an offer to sell or the solicitation of an offer to buy securities of the Company.

Item
9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No. Description

- | | |
|------|---|
| 10.1 | Form of Stock Purchase Agreement dated October 25, 2012. |
| 10.2 | Form of Registration Rights Agreement dated October 25, 2012. |
| 10.3 | Joinder Agreement dated October 25, 2012. |
| 10.4 | Form of Placement Agent Warrant dated October 30, 2012. |
| 99.1 | Press Release dated October 31, 2012. |

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 31, 2012 SYNTHETIC
BIOLOGICS, INC.
(Registrant)

By: /s/ C. Evan Ballantyne
Name: C. Evan Ballantyne
Title: Chief Financial
Officer

INDEX OF EXHIBITS

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| 99.1 | Press Release dated October 31, 2012. |

STOCK PURCHASE AGREEMENT

This Stock Purchase Agreement (this “Agreement”) is dated as of October 25, 2012, among Synthetic Biologics, Inc., a Nevada corporation (the “Company”), and each purchaser identified on the signature pages hereto (each, including its successors and assigns, a “Purchaser” and collectively the “Purchasers”).

RECITALS

- A. The Company and each Purchaser is executing and delivering this Agreement in reliance upon the exemption from securities registration afforded by Section 4(2) of the Securities Act, and Rule 506 of Regulation D (“Regulation D”) as promulgated by the United States Securities and Exchange Commission (the “Commission”) under the Securities Act.
- B. Each Purchaser, severally and not jointly, wishes to purchase, and the Company wishes to sell, upon the terms and conditions stated in this Agreement, that aggregate number of shares of Common Stock set forth below such Purchaser’s name on the signature page of this Agreement.
- C. Contemporaneously with the execution and delivery of this Agreement, the parties hereto are executing and delivering the Registration Rights Agreement, pursuant to which, among other things, the Company will agree to provide certain registration rights with respect to the Shares under the Securities Act and the rules and regulations promulgated thereunder and applicable state securities laws.

AGREEMENT

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration the receipt and adequacy of which are hereby acknowledged, the Company and each Purchaser agree as follows:

Article I
DEFINITIONS

Section 1.1 Definitions. In addition to the terms defined elsewhere in this Agreement, for all purposes of this Agreement, the following terms have the meanings set forth in this Section 1.1:

“Affiliate” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person as such terms are used in and construed under Rule 144 under the Securities Act. With respect to a Purchaser, any investment fund or managed account that is managed on a discretionary basis by the same investment manager as such Purchaser will be deemed to be an Affiliate of such Purchaser.

“Business Day” means any day except Saturday, Sunday, any day which shall be a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

“Closing” means the closing of the purchase and sale of the Securities pursuant to Section 2.1.

“Closing Date” means the date and time of the Closing.

“Commission” means the Securities and Exchange Commission.

“Common Stock” means the Common Stock of the Company, par value \$0.001 per share, and any other class of securities into which such securities may hereafter be reclassified or changed into.

“Common Stock Equivalents” means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

“Company Counsel” means Gracin & Marlow, LLP.

“Compliance Certificate” shall have the meaning ascribed to such term in Section 2.4(b)(iii).

“Disclosure Schedules” means the Disclosure Schedules of the Company delivered concurrently herewith.

“Effective Date” means the date that the initial Registration Statement filed by the Company pursuant to the Registration Rights Agreement is first declared effective by the Commission.

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Exempt Issuance” means the issuance of (a) shares of Common Stock or options to employees, officers or directors of the Company pursuant to any stock or option plan duly adopted for such purpose, by a majority of the non-employee members of the Board of Directors of the Company or a majority of the members of a committee of non-employee directors established by the Board of Directors, (b) securities upon the exercise or exchange of or conversion of any Securities issued hereunder and/or other securities exercisable or exchangeable for or convertible into shares of Common Stock issued and outstanding on the date of this Agreement, provided that such securities have not been amended since the date of this Agreement to increase the number of such securities or to decrease the exercise, exchange or conversion price of such securities, (c) securities issued as a result of cancellation and/or transfer of previously issued securities of the Company which do not result in a dilutive effect on the Company’s securities, (d) securities issued in connection with and pursuant to a stockholder “rights” plan, “poison pill” or other similar anti-takeover plan adopted by the Company, and (e) securities issued in connection with or pursuant to acquisitions or strategic transactions approved by a majority of the disinterested directors of the Company, provided that any such issuance shall only be to a Person which is, itself or through its subsidiaries or Affiliates, an operating company in a business synergistic with the business of the Company and in which the Company receives benefits in addition to the investment of funds, but shall not include a transaction in which the Company is issuing securities primarily for the purpose of raising capital or to a Person whose primary business is investing in securities.

“GAAP” shall have the meaning ascribed to such term in Section 3.1(e).

“Intellectual Property” shall have the meaning ascribed to such term in Section 3.1(o).

“Legend Removal Date” shall have the meaning ascribed to such term in Section 4.1(c).

“Liens” means a lien, charge, security interest, encumbrance, right of first refusal, preemptive right or other restriction.

“Material Adverse Effect” shall have the meaning ascribed to such term in Section 3.1(a).

“Material Permits” shall have the meaning ascribed to such term in Section 3.1(z).

“Money Laundering Laws” shall have the meaning ascribed to such term in Section 3.1(cc).

“OFAC” shall have the meaning ascribed to such term in Section 3.1(bb).

“Per Share Purchase Price” equals \$1.60.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Proceeding” means an action, claim, suit, investigation or proceeding (including, without limitation, an investigation or partial proceeding, such as a deposition), whether commenced or threatened.

“Purchaser Party” shall have the meaning ascribed to such term in Section 4.5.

“Registration Rights Agreement” means the Registration Rights Agreement, dated the date hereof, among the Company and the Purchasers, in the form of Exhibit A attached hereto.

“Registration Statement” means a registration statement meeting the requirements set forth in the Registration Rights Agreement and covering the resale by the Purchasers of the Shares.

“Rule 144” means Rule 144 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same effect as such Rule.

“SEC Documents” shall have the meaning ascribed to such term in Section 3.1(e).

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Shares” means the shares of Common Stock issued or issuable to each Purchaser pursuant to this Agreement.

“Short Sales” include, without limitation, all “short sales” as defined in Rule 200 promulgated under Regulation SHO under the Exchange Act, whether or not against the box, and all types of direct and indirect stock pledges, forward sale contracts, options, puts, calls, short sales, swaps, “put equivalent positions” (as defined in Rule 16a-1(h) under the Exchange Act) and similar arrangements (including on a total return basis), and sales and other transactions through non-U.S. broker dealers or foreign regulated brokers.

“Subscription Amount” means, as to each Purchaser, the aggregate amount to be paid for Shares purchased hereunder as specified below such Purchaser’s name on the signature page of this Agreement and next to the heading “Subscription Amount,” in United States dollars and in immediately available funds.

“Subscription Document Package” means a package consisting of Purchaser Information Request; Investors Questionnaire; Escrow Agent information for payment of the Shares; and Signature Pages to the Transaction Documents.

“Subsidiary” means any subsidiary of the Company as set forth in the SEC Documents.

“Trading Day” means a day on which the Common Stock is traded on a Trading Market.

“Trading Market” means the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE, NYSE MKT, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq

Global Select Market, the New York Stock Exchange or the OTC Bulletin Board.

“Transaction Documents” means this Agreement, the Registration Rights Agreement and any other documents or agreements executed in connection with the transactions contemplated hereunder.

“Transfer Agent” means Continental Stock Transfer and Trust Company, and any successor transfer agent of the Company.

Article II
PURCHASE AND SALE

Section 2.1 Closing. Upon the terms and subject to the conditions set forth herein, the Company agrees to sell, and the Purchasers, severally and not jointly, agree to purchase, such number of Shares equal to the quotient resulting from dividing (i) the Subscription Amount for such Purchaser by (ii) the Per Share Purchase Price, rounded down to the nearest whole Share. The Closing shall occur on the Business Day immediately following the date of execution of this Agreement remotely via the exchange of documents and signatures.

Section 2.2 Form of Payment. Except as may otherwise be agreed to among the Company and one or more of the Purchasers, on or prior to the Business Day immediately prior to the Closing Date, each Purchaser shall wire its Subscription Amount, in United States dollars and in immediately available funds, to an escrow account established by the Company and the Placement Agent (the aggregate amounts received being held in escrow are referred to herein as the "Escrow Amount"). On the Closing Date, (a) the Escrow Amount shall be distributed as follows: (1) to the Placement Agent, the fees and reimbursable expenses payable to the Placement Agent, and (2) the balance of the aggregate Escrow Amount to the Company, and (b) the Company shall irrevocably instruct the Transfer Agent to deliver to each Purchaser one or more stock certificates, free and clear of all restrictive and other legends (except as expressly provided in Section 4.1(b) hereof), evidencing the number of Shares such Purchaser is purchasing within three Trading Days after the Closing. Notwithstanding the foregoing, in the event a Purchaser has specified to the Company at the time of execution of this Agreement that it shall settle "delivery versus payment", the Company shall deliver the Shares to such Purchaser on or before the Closing Date and, upon receipt, the Purchaser shall wire its Subscription Amount to an account designated in writing by the Company on the Closing Date.

Section 2.3 Deliveries.

- (a) At the Closing, the Company shall deliver or cause to be delivered to each Purchaser the following:
- (i) this Agreement duly executed by the Company;
 - (ii) facsimile or ".pdf" copies of one or more stock certificates, free and clear of all restrictive and other legends (except as provided in Section 4.1(b) hereof), evidencing the Shares subscribed for by such Purchaser hereunder, registered in the name of such Purchaser as set forth on the Purchaser Information Document as provided in the Subscription Document Package (the "Stock Certificates"), with the original Stock Certificates delivered by the Transfer Agent within three Trading Days of Closing (unless such Purchaser has specified to the Company at the time of execution of this Agreement that it shall settle "delivery versus payment" in which case such original Stock Certificates shall be delivered on or prior to the Closing Date);

(iii) the Registration Rights Agreement duly executed by the Company;

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(iv) a certificate of the Secretary of the Company (the “Secretary’s Certificate”), dated as of the Closing Date, (a) certifying the resolutions adopted by the Board of Directors of the Company or a duly authorized committee thereof approving the transactions contemplated by this Agreement and the other Transaction Documents and the issuance of the Shares, (b) certifying the current versions of the certificate or articles of incorporation, as amended, and by-laws of the Company and (c) certifying as to the signatures and authority of persons signing the Transaction Documents and related documents on behalf of the Company;

(v) the Compliance Certificate referred to in Section 2.4(b); and

(vi) a legal opinion of Company Counsel in the form of Exhibit B attached hereto.

(b) At the Closing, each Purchaser shall deliver or cause to be delivered to the Company the following:

(i) this Agreement duly executed by such Purchaser;

(ii) subject to Section 2.2, such Purchaser’s Subscription Amount through direction to the Escrow Agent, or directly to the Company as applicable, by wire transfer to the account as specified in writing by the Company;

(iii) the Registration Rights Agreement duly executed by such Purchaser; and

(iv) a fully completed and duly executed Subscription Document package.

Section 2.4 Closing Conditions.

(a) The obligations of the Company hereunder in connection with the Closing are subject to the following conditions being met or waived by the Company:

- (i) the accuracy when made and on the Closing Date of the representations and warranties of the Purchasers contained herein (except with respect to representations and warranties which relate to a specific date, in which case such representations and warranties shall continue to be materially accurate as of such date);

- (ii) all obligations, covenants and agreements of the Purchasers required to be performed at or prior to the Closing Date shall have been performed;

- (iii) the delivery by the Purchasers of the items set forth in Section 2.3(b) of this Agreement;

- (iv) no statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any court or governmental authority of competent jurisdiction that prohibits the consummation of any of the transactions contemplated by the Transaction Documents;

(v) the Company shall have obtained in a timely fashion any and all consents, permits, approvals, registrations and waivers necessary for consummation of the purchase and sale of the Shares, all of which shall be and remain so long as necessary in full force and effect.

(b) The respective obligations of the Purchasers hereunder in connection with the Closing are subject to the following conditions being met or waived by each Purchaser as to itself:

(i) the accuracy on the Closing Date of the representations and warranties of the Company contained herein (except with respect to representations and warranties which relate to a specific date, in which case such representations and warranties shall continue to be materially accurate as of such date);

(ii) all obligations, covenants and agreements of the Company required to be performed at or prior to the Closing Date shall have been performed;

(iii) the delivery by the Company of the items set forth in Section 2.3(a) of this Agreement and a certificate, dated as of the Closing Date and signed by its Chief Executive Officer or its Chief Financial Officer, certifying to the fulfillment of the conditions specified in Sections 2.4(b)(i) and (ii) (the "Compliance Certificate");

(iv) on the Closing Date, trading in the Common Stock shall not have been suspended by the Commission or the Company's principal Trading Market (except for any suspension of trading of limited duration agreed to by the Company, which suspension shall be terminated prior to the Closing), and, at any time prior to the Closing Date, trading in securities generally as reported by Bloomberg L.P. shall not have been suspended or limited, or minimum prices shall not have been established on securities whose trades are reported by such service, or on any Trading Market, nor shall a banking moratorium have been declared either by the United States or New York State authorities;

(v) no statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any court or governmental authority of competent jurisdiction that prohibits the consummation of any of the transactions contemplated by the Transaction Documents;

(vi) the Company shall have obtained in a timely fashion any and all consents, permits, approvals, registrations and waivers necessary for consummation of the purchase and sale of the Shares, all of which shall be and remain so long as necessary in full force and effect;

(vii) the Company shall have duly executed and entered into Stock Purchase Agreements to sell at least 3,125,000 Shares for an aggregate amount of gross proceeds of \$5,000,000; and

(viii) the Company's Board of Directors, to the extent permissible under Nevada law, shall have taken all necessary action such that any provisions contained in its Articles of Incorporation, its Bylaws or Nevada law that may apply to business combinations or other transactions with affiliated stockholders or impact the voting rights of affiliated stockholders shall not apply to the Purchasers or their Affiliates, including but not limited to Sections 78.378 to 78.3793 and Sections 78.411 to 78.444 of the Nevada Revised Statutes. The Company shall not have adopted any stockholder rights plan, "poison pill" or similar arrangement, or any anti-takeover provisions under its charter documents, that would trigger any right, obligation or event as a result of the issuance of the Shares pursuant hereto to the Purchasers or the Purchasers' ownership of such securities, or the accumulation of Company securities acquired in the market by the Purchasers or their respective Affiliates.

Article III

REPRESENTATIONS AND WARRANTIES

Section 3.1 Representations and Warranties of the Company. Except as set forth in the SEC Documents and Disclosure Schedules which Disclosure Schedules shall be deemed a part hereof and shall qualify any representation or otherwise made herein to the extent of the disclosure contained in the corresponding Section of the Disclosure Schedules, the Company hereby makes the following representations and warranties to each Purchaser as of the Closing Date:

(a) Organization, Good Standing and Power. The Company is a corporation duly incorporated, validly existing and in good standing under the laws of the State of Nevada and has the requisite corporate power to own, lease and operate its properties and assets and to conduct its business as it is now being conducted and as described in the reports filed by the Company with the Commission pursuant to the reporting requirements of the Exchange Act, since the end of its most recently completed fiscal year through the date hereof, including, without limitation, its most recent report on Form 10-Q. The Company does not have any material Subsidiaries, and none of its Subsidiaries is actively engaged in any business, owns any property or has any employees. The Company is qualified to do business as a foreign corporation and is in good standing in every jurisdiction in which the nature of the business conducted or property owned by it makes such qualification necessary, except for any jurisdiction(s) (alone or in the aggregate) in which the failure to be so qualified will not have a Material Adverse Effect. For the purposes of this Agreement, "Material Adverse Effect" means any effect on the business, results of operations, assets, properties, prospects or condition (financial or otherwise) of the Company that could reasonably be expected to be material and adverse to the Company, taken as a whole, and any condition, circumstance or situation that would prohibit or adversely affect in any material respect the Company's entering into and performing any of its obligations under the Transaction Documents.

(b) Authorization; Enforcement. The Company has the requisite corporate power and authority to enter into and perform the Transaction Documents and to issue the Shares in accordance with the terms hereof. The execution, delivery and performance of the Transaction Documents by the Company and the consummation by it of the transactions contemplated hereby have been duly and validly authorized by all necessary corporate action, and no further consent or authorization of the Company, its board of directors or stockholders is required. When executed and

delivered by the Company, the Transaction Documents shall constitute a valid and binding obligation of the Company enforceable against the Company in accordance with its terms, except as such enforceability may be limited by applicable bankruptcy, reorganization, moratorium, liquidation, conservatorship, receivership or similar laws relating to, or affecting generally the enforcement of, creditor's rights and remedies or by other equitable principles of general application.

(c) Issuance of Shares. The Shares to be issued and sold hereunder have been duly authorized by all necessary corporate action and, when issued in accordance with the terms hereof, will be validly issued, fully paid and nonassessable. In addition, such Shares will be free and clear of all liens, claims, charges, security interests or agreements, pledges, assignments, covenants, restrictions or other encumbrances created by, or imposed by, the Company (collectively, “Encumbrances”) and rights of refusal of any kind imposed by the Company (other than restrictions on transfer under applicable securities laws) and the holder of such shares shall be entitled to all rights accorded to a holder of Common Stock. As of the date hereof, 36,947,748 shares of the Company’s Common Stock are issued and outstanding and no shares of preferred stock are outstanding. The Company has options outstanding to acquire 4,258,746 shares of Common Stock and warrants outstanding to acquire 1,324,102 shares of Common Stock. There are no other outstanding options, warrants, scrip rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities, rights or obligations convertible into or exercisable or exchangeable for, or giving any Person any right to subscribe for or acquire any shares of Common Stock, or contracts, commitments, understandings or arrangements by which the Company or any Subsidiary is or may become bound to issue additional shares of Common Stock or Common Stock Equivalents. All of the outstanding shares of capital stock of the Company are duly authorized, validly issued, fully paid and nonassessable, have been issued in compliance with all federal and state securities laws, and none of such outstanding shares was issued in violation of any preemptive rights or similar rights to subscribe for or purchase securities. There are no stockholders agreements, voting agreements or other similar agreements with respect to the Company’s capital stock to which the Company is a party or, to the knowledge of the Company, between or among any of the Company’s stockholders.

(d) No Conflicts; Governmental Approvals. The execution, delivery and performance of the Transaction Documents by the Company and the consummation by the Company of the transactions contemplated hereby do not and will not (i) violate any provision of the Company’s Articles of Incorporation or Bylaws, each as amended to date, (ii) conflict with, or constitute a default (or an event which with notice or lapse of time or both would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any agreement, mortgage, deed of trust, indenture, note, bond, license, lease agreement, instrument or obligation to which the Company is a party or by which the Company’s properties or assets are bound, or (iii) result in a violation of any federal, state, local or foreign statute, rule, regulation, order, judgment or decree (including federal and state securities laws and regulations) applicable to the Company or by which any property or asset of the Company is bound or affected, except for such conflicts, defaults, terminations, amendments, acceleration, cancellations and violations as would not, individually or in the aggregate, have a Material Adverse Effect. The Company is not required under federal, state, foreign or local law, rule or regulation to obtain any consent, authorization or order of, or make any filing or registration with, any court or governmental agency in order for it to execute, deliver or perform any of its obligations under this Agreement or issue and sell the shares in accordance with the terms hereof (other than any filings, consents and approvals which may be required to be made by the Company under applicable state and federal securities laws, rules or regulations or rules or regulations of the NYSE MKT, prior to or subsequent to the Closing).

(e) Commission Documents, Financial Statements. The Common Stock of the Company is registered pursuant to Section 12(b) of the Exchange Act. During the year preceding this Agreement, the Company has timely filed all reports, schedules, forms, statements and other documents required to be filed by it with the Commission pursuant to the reporting requirements of the Exchange Act other than its Annual Report on Form 10-K for the year ended December 31, 2011 filed with the Commission on March 30, 2012 (the "2012 10-K") which due to the failure of Berman & Co. to follow proper partner rotation procedures resulted in the withdrawal of Berman & Co.'s audit opinion included in the 2012 10-K and the Company being unable to rely upon such audit opinion. (the foregoing materials exclusive of the 2012 10-K but inclusive of Company's annual report on Form 10-K/A for the year ended December 31, 2011 filed with the Commission on May 11, 2012 and all of the exhibits to all such materials and the documents incorporated by reference therein being collectively referred to as the "SEC Documents"). At the times of their respective filing, all SEC Documents complied in all material respects with the requirements of the Exchange Act and the rules and regulations of the Commission promulgated thereunder. At the times of their respective filings, such reports, schedules, forms, statements and other documents did not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. As of their respective dates, the financial statements of the Company included in the SEC Documents complied in all material respects with applicable accounting requirements and the published rules and regulations of the Commission or other applicable rules and regulations with respect thereto. Such financial statements have been prepared in accordance with United States generally accepted accounting principles applied on a consistent basis ("GAAP") during the periods involved (except (i) as may be otherwise indicated in such financial statements or the notes thereto or (ii) in the case of unaudited interim statements, to the extent they may not include footnotes or may be condensed or summary statements), and fairly present in all material respects the consolidated financial position of the Company as of the dates thereof and the results of operations and cash flows for the periods then ended (subject, in the case of unaudited statements, to normal year-end audit adjustments).

(f) Accountants. Berman & Company, P.A. whose report on the financial statements of the Company is filed with the Commission in the Company's Annual Report on Form 10-K for the year ended December 31, 2011, were, at the time such report was issued, independent registered public accountants as required by the Securities Act. On July 3, 2012 the Company dismissed Berman & Company, P.A. as its independent registered public accounting firm, and on July 9, 2012, the Company selected BDO USA, LLP as its new independent registered public accounting firm responsible for auditing its financial statements.

(g) Internal Controls. The Company has established and maintains a system of internal accounting controls sufficient to provide reasonable assurances that: (i) transactions are executed in accordance with management's general or specific authorization; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles in the United States and to maintain accountability for assets; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with existing assets at reasonable intervals and appropriate action is taken with respect to any differences.

(h) Disclosure Controls. The Company has established and maintains disclosure controls and procedures (as such term is defined in Rules 13a-15 and 15d-15 under the Exchange Act). Since the date of the most recent evaluation of such disclosure controls and procedures, there have been no significant changes in internal controls or in other factors that could significantly affect internal controls, including any corrective actions with regard to significant deficiencies and material weaknesses. The Company is in compliance in all material respects with all provisions currently in effect and applicable to the Company of the Sarbanes-Oxley Act of 2002, and all rules and regulations promulgated thereunder or implementing the provisions thereof.

(i) No Material Adverse Change. Except as disclosed in the SEC Documents, since December 31, 2011, the Company has not (i) experienced or suffered any Material Adverse Effect, (ii) incurred any material liabilities, obligations, claims or losses (whether liquidated or unliquidated, secured or unsecured, absolute, accrued, contingent or otherwise) other than those incurred in the ordinary course of the Company's business or (iii) declared, made or paid any dividend or distribution of any kind on its capital stock.

(j) No Undisclosed Events or Circumstances. Except as disclosed in the SEC Documents, and except for the consummation of the transactions contemplated herein, since December 31, 2011, to the Company's knowledge, no event or circumstance has occurred or exists with respect to the Company or its businesses, properties, prospects, operations or financial condition, which, under applicable law, rule or regulation, requires public disclosure or announcement by the Company but which has not been so publicly announced or disclosed.

(k) Litigation. No action, suit, proceeding or investigation is currently pending or, to the knowledge of the Company, has been threatened in writing against the Company that: (i) concerns or questions the validity of this Agreement; (ii) concerns or questions the right of the Company to enter into this Agreement; or (iii) is reasonably likely to have a Material Adverse Effect. The Company is neither a party to nor subject to the provisions of any material order, writ, injunction, judgment or decree of any court or government agency or instrumentality. There is no action, suit, proceeding or investigation by the Company currently pending or that the Company intends to initiate that would have a Material Adverse Effect. Neither the Company nor any Subsidiary, nor any director or officer thereof, is or has been the subject of any Action involving a claim of violation of or liability under federal or state securities laws or a claim of breach of fiduciary duty. There has not been, and to the knowledge of the Company, there is not pending or contemplated, any investigation by the Commission involving the Company or any current director or officer of the Company. The Commission has not issued any stop order or other order suspending the effectiveness of any registration statement filed by the Company or any Subsidiary under the Exchange Act or the Securities Act.

(l) Compliance. Except for defaults or violations which are not reasonably likely to have a Material Adverse Effect, the Company is not (i) in default under or in violation of (and no event has occurred that has not been waived that, with notice or lapse of time or both, would result in a default by the Company under), nor has the Company received notice of a claim that it is in default under or that it is in violation of, any indenture, loan or credit agreement or any other agreement or instrument to which it is a party or by which it or any of its properties is bound (whether or not such default or violation has been waived), (ii) is in violation of any order of any court, arbitrator or governmental body, or (iii) is or has been in violation of any statute, rule or regulation of any governmental authority, including without limitation all foreign, federal, state and local laws, applicable to its business.

(m) Intellectual Property

(i) To the best of its knowledge, the Company has entered into agreements with each of its current and former officers, employees and consultants involved in research and development work, including development of the Company's products and technology providing the Company, to the extent permitted by law, with title and ownership to patents, patent applications, trade secrets and inventions conceived, developed, reduced to practice by such person, solely or jointly with other of such persons, during the period of employment by the Company except where the failure to have entered into such an agreement would not have a Material Adverse Effect. The Company is not aware that any of its employees or consultants is in material violation thereof.

(ii) To the Company's knowledge, the Company owns or possesses adequate rights to use all trademarks, service marks, trade names, domain names, copyrights, patents, patent applications, inventions, know how (including trade secrets and other unpatented and/or unpatentable proprietary or confidential information, systems or procedures), and other intellectual property rights ("Intellectual Property") as are necessary for the conduct of its business as described in the Commission Documents. Except as described in the SEC Documents, (i) to the knowledge of the Company, there is no infringement, misappropriation or violation by third parties of any such Intellectual Property; (ii) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others against the Company challenging the Company's rights in or to any such Intellectual Property; (iii) the Intellectual Property owned by the Company and, to the knowledge of the Company, the Intellectual Property licensed to the Company has not been adjudged invalid or unenforceable by a court of competent jurisdiction or applicable government agency, in whole or in part, and there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others challenging the validity or scope of any such Intellectual Property; (iv) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others against the Company that the Company infringes, misappropriates or otherwise violates any Intellectual Property or other proprietary rights of others, and the Company has not received any written notice of such claim; and (v) to the Company's knowledge, no employee of the Company is the subject of any claim or proceeding involving a violation of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement, nondisclosure agreement or any restrictive covenant to or with a former employer where the basis of such violation relates to such employee's employment with the Company or actions undertaken by the employee while employed with the Company, in each of (i) through (v), for any instances which would not, individually or in the aggregate, result in a Material Adverse Effect. The Company has taken reasonable security measures to protect the secrecy, confidentiality and value of all of its intellectual properties, except where failure to do so could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

(n) FDA Compliance.

(i) Except as described in the SEC Documents, the Company: (i) is in material compliance with all statutes, rules or regulations applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, marketing, labeling, promotion, sale, offer for sale, storage, import, export or disposal of any product that is under development, manufactured or distributed by the Company (“Applicable Laws”); (ii) has not received any FDA Form 483, notice of adverse finding, warning letter, untitled letter or other correspondence or notice from the U.S. Food and Drug Administration (the “FDA”) or any other federal, state, local or foreign governmental or regulatory authority alleging or asserting material noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws (“Authorizations”); (iii) possesses all material Authorizations necessary for the operation of its business as described in the SEC Documents and such Authorizations are valid and in full force and effect and the Company is not in material violation of any term of any such Authorizations; and (iv) since January 1, 2012: (A) has not received notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from the FDA or any other federal, state, local or foreign governmental or regulatory authority or third party alleging that any product operation or activity is in material violation of any Applicable Laws or Authorizations and has no knowledge that the FDA or any other federal, state, local or foreign governmental or regulatory authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding; (B) has not received notice that the FDA or any other federal, state, local or foreign governmental or regulatory authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any material Authorizations and has no knowledge that the FDA or any other federal, state, local or foreign governmental or regulatory authority is considering such action; (C) has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were materially complete and correct on the date filed (or were corrected or supplemented by a subsequent submission); and (D) has not, either voluntarily or involuntarily, initiated, conducted, or issued or caused to be initiated, conducted or issued, any recall, market withdrawal or replacement, safety alert, post sale warning, “dear doctor” letter, or other notice or action relating to the alleged lack of safety or efficacy of any product or any alleged product defect or violation and, to the Company’s knowledge, no third party has initiated, conducted or intends to initiate any such notice or action.

(ii) Since January 1, 2012, and except to the extent disclosed in the SEC Documents, the Company has not received any notices or correspondence from the FDA or any other federal, state, local or foreign governmental or regulatory authority requiring the termination, suspension or material modification of any studies, tests or preclinical or clinical trials conducted by or on behalf of the Company.

(o) General Healthcare Regulatory Compliance.

(i) As used in this subsection:

(A) “Governmental Entity” means any national, federal, state, county, municipal, local or foreign government, or any political subdivision, court, body, agency or regulatory authority thereof, and any Person exercising executive, legislative, judicial, regulatory, taxing or administrative functions of or pertaining to any of the foregoing.

(B) “Law” means any federal, state, local, national or foreign law, statute, code, ordinance, rule, regulation, order, judgment, writ, stipulation, award, injunction, decree or arbitration award or finding.

(ii) The Company has not committed any act, made any statement or failed to make any statement that would reasonably be expected to provide a basis for the FDA or any other Governmental Entity to invoke its policy with respect to “Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities”, or similar policies, set forth in any applicable Laws. Neither the Company, nor, to the knowledge of the Company, any of its officers, key employees or agents has been convicted of any crime or engaged in any conduct that has resulted, or would reasonably be expected to result, in debarment under applicable Law, including, without limitation, 21 U.S.C. Section 335a. No claims, actions, proceedings or investigations that would reasonably be expected to result in such a material debarment or exclusion are pending, or to the knowledge of the Company, threatened, against the Company or any of its respective officers, employees or agents.

(iii) Each of the Company and, to its knowledge, its directors, officers, employees, and agents (while acting in such capacity) is, and at all times has been, in material compliance with all health care Laws applicable to the Company or by which any of its properties, businesses, products or other assets is bound or affected, including, without limitation, the federal Anti-kickback Statute (42 U.S.C. § 1320a-7b(b)), the Anti-Inducement Law (42 U.S.C. § 1320a-7a(a)(5)), the civil False Claims Act (31 U.S.C. §§ 3729 et seq.), the administrative False Claims Law (42 U.S.C. § 1320a-7b(a)), the Health Insurance Portability and Accountability Act of 1996 (42 U.S.C. § 1320d et seq.), the exclusion laws (42 U.S.C. § 1320a-7), the Food Drug and Cosmetic Act (21 U.S.C. §§ 301 et seq.) (collectively, “Health Care Laws”). The Company has not received any notification, correspondence or any other written or oral communication from any Governmental Entity, including, without limitation, the FDA, the Centers for Medicare and Medicaid Services, and the Department of Health and Human Services Office of Inspector General, of potential or actual material non-compliance by, or liability of, the Company under any Health Care Laws.

(iv) The Company is not a party to any corporate integrity agreements, monitoring agreements, consent decrees, settlement orders, or similar agreements with or imposed by any Governmental Entity.

(p) Application of Takeover Protections. The issuance of the Shares hereunder and the Purchasers' ownership thereof is not prohibited by the business combination statutes of the state of Nevada. The Company has not adopted any stockholder rights plan, "poison pill" or similar arrangement that would trigger any right, obligation or event as a result of the issuance of such Shares and the Purchasers' ownership of such shares and there are no similar anti-takeover provisions under the Company's charter documents. The Company is not subject to Sections 78.378 to 78.3793 of the Nevada Revised Statutes, because it is not an "issuing corporation" as defined in Section 73.3788 of the Nevada Revised Statutes.

(q) Listing and Maintenance Requirements. The Company is in compliance with the requirements of the NYSE MKT for continued trading of the Common Stock pursuant thereto. The issuance and sale of the shares hereunder does not contravene the rules and regulations of the NYSE MKT.

(r) Private Placement. Neither the Company nor its Affiliates, nor any Person acting on its or their behalf, (i) has engaged in any form of general solicitation or general advertising (within the meaning of Regulation D under the Securities Act) in connection with the offer or sale of the Shares hereunder, (ii) has, directly or indirectly, made any offers or sales of any security or solicited any offers to buy any security, under any circumstances that would require registration of the sale and issuance by the Company of the Shares under the Securities Act or (iii) has issued any shares of Common Stock or shares of any series of preferred stock or other securities or instruments convertible into, exchangeable for or otherwise entitling the holder thereof to acquire shares of Common Stock which would be integrated with the sale of the shares to Purchasers for purposes of the Securities Act or of any applicable stockholder approval provisions, including, without limitation, under the rules and regulations of any exchange or automated quotation system on which any of the securities of the Company are listed or designated, nor will the Company or any of its subsidiaries or affiliates take any action or steps that would require registration of any of the Shares under the Securities Act or cause the offering of the shares to be integrated with other offerings. Assuming the accuracy of the representations and warranties of Purchasers, the offer and issuance of the Shares by the Company to Purchasers pursuant to this Agreement will be exempt from the registration requirements of the Securities Act.

(s) No Manipulation of Stock. The Company has not taken, and has no plans to take, in violation of applicable law, any action outside the ordinary course of business designed to, or that might reasonably be expected to, cause or result in unlawful manipulation of the price of the Common Stock.

(t) Brokers. Other than Griffin Securities, Inc. being engaged as the Company's Placement Agent for a fee consisting of (i) six percent (6%) of the gross proceeds to the Company from this Stock Purchase Agreement, and (ii) a five year warrant to purchase ten percent (10%) of the total number of shares of Company Common Stock issued pursuant to the Stock Purchase Agreement exercisable at the Per Share Purchase Price paid by Purchasers, neither the Company nor any of the officers, directors or employees of the Company has employed any broker or finder in connection with the transaction contemplated by this Agreement. The Company shall indemnify Purchasers from and against any broker's, finder's or agent's fees for which the Company is responsible.

(u) Solvency. Based on the financial condition of the Company as of the Closing Date, (i) the fair saleable value of the Company's assets exceeds the amount that will be required to be paid on or in respect of the Company's existing debts and other liabilities (including known contingent liabilities) as they mature; (ii) the Company's assets do not constitute unreasonably small capital to carry on its business as now conducted and as proposed to be conducted including its capital needs taking into account the particular capital requirements of the business conducted by the Company, and projected capital requirements and capital availability thereof; and (iii) the current cash flow of the Company, together with the proceeds the Company would receive, were it to liquidate all of its assets, after taking into account all anticipated uses of the cash, would be sufficient to pay all amounts on or in respect of its liabilities when such amounts are required to be paid. The Company does not intend to incur debts beyond its ability to pay such debts as they mature (taking into account the timing and amounts of cash to be payable on or in respect of its debt). Assuming the Closing occurs, the Company has no knowledge of any facts or circumstances which lead it to believe that it will file for reorganization or liquidation under the bankruptcy or reorganization laws of any jurisdiction within one year from the Closing Date.

(v) Foreign Corrupt Practices. Neither the Company, nor to the knowledge of the Company, any agent or other person acting on behalf of the Company, has (i) directly or indirectly, used any funds for unlawful contributions, gifts, entertainment or other unlawful expenses related to foreign or domestic political activity, (ii) made any unlawful payment to foreign or domestic government officials or employees or to any foreign or domestic political parties or campaigns from corporate funds, (iii) failed to disclose fully any contribution made by the Company (or made by any person acting on its behalf of which the Company is aware) which is in violation of law, or (iv) violated in any material respect any provision of the Foreign Corrupt Practices Act of 1977, as amended.

(w) Investment Company. The Company is not, and is not an Affiliate of, and immediately after receipt of payment for the Shares, will not be or be an Affiliate of, an "investment company" within the meaning of the Investment Company Act of 1940, as amended. The Company shall conduct its business in a manner so that it will not become an "investment company" subject to registration under the Investment Company Act of 1940, as amended.

(x) Tax Status. Except for matters that would not, individually or in the aggregate, have or reasonably be expected to result in a Material Adverse Effect, the Company and its Subsidiaries each (i) has made or filed all United States federal, state and local income and all foreign income and franchise tax returns, reports and declarations required by any jurisdiction to which it is subject, (ii) has paid all taxes and other governmental assessments and charges that are material in amount, shown or determined to be due on such returns, reports and declarations and (iii) has set aside on its books provision reasonably adequate for the payment of all material taxes for periods subsequent to the periods to which such returns, reports or declarations apply. There are no unpaid taxes in any material amount claimed to be due by the taxing authority of any jurisdiction, and the officers of the Company or of any Subsidiary know of no basis for any such claim.

(y) Labor Relations. No material labor dispute exists or, to the knowledge of the Company, is imminent with respect to any of the employees of the Company, which could reasonably be expected to result in a Material Adverse Effect. None of the Company's employees is a member of a union that relates to such employee's relationship with the Company, and the Company is not a party to a collective bargaining agreement, and the Company believes that its relationships with its employees are good. To the knowledge of the Company, no executive officer of the Company is, or is now expected to be, in violation of any material term of any employment contract, confidentiality, disclosure or proprietary information agreement or non-competition agreement, or any other contract or agreement or any restrictive covenant in favor of any third party, and the continued employment of each such executive officer does not subject the Company to any liability with respect to any of the foregoing matters. The Company is in compliance in all material respects with all U.S. federal, state, local and foreign laws and regulations relating to employment and employment practices, terms and conditions of employment and wages and hours.

(z) Regulatory Permits. The Company possesses all certificates, authorizations and permits issued by the appropriate federal, state, local or foreign regulatory authorities necessary to conduct its business as described in the SEC Reports, except where the failure to possess such permits could not reasonably be expected to result in a Material Adverse Effect ("Material Permits"), and the Company has not received any notice of proceedings relating to the revocation or modification of any Material Permit.

(aa) Title to Assets. The Company has good and marketable title in fee simple to all real property owned by it and good and marketable title in all personal property owned by it that is material to the business of the Company, in each case free and clear of all Liens, except for (i) Liens as do not materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company and (ii) Liens for the payment of federal, state or other taxes, for which appropriate reserves have been made therefor in accordance with GAAP and the payment of which is neither delinquent nor subject to penalties. Any real property and facilities held under lease by the Company are held by them under valid, subsisting and enforceable leases with which the Company is in compliance.

(bb) Office of Foreign Assets Control. Neither the Company nor any Subsidiary nor, to the Company's knowledge, any director, officer, agent, employee or affiliate of the Company or any Subsidiary (i) has violated any rule or regulation issued or is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Treasury Department ("OFAC") or (ii) has violated any rule or regulation issued by the U.S. Secretary of the Treasury under Section 311 or 312 of the USA Patriot Act or similar rules or regulations.

(cc) Money Laundering. The operations of the Company and its Subsidiaries are and have been conducted at all times in compliance with applicable financial record-keeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, applicable money laundering statutes and applicable rules and regulations thereunder, including rules and regulations issued by the Financial Action Task Force on Money Laundering (collectively, the "Money Laundering Laws"), and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or any Subsidiary with respect to the Money Laundering Laws is pending or, to the knowledge of the Company or any Subsidiary, threatened.

(dd) Disclosure. All of the disclosure furnished by or on behalf of the Company to the Purchasers regarding the Company and its Subsidiaries, their respective businesses and the transactions contemplated hereby, including the Disclosure Schedules to this Agreement, is true and correct and does not contain any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading.

Section 3.2 Representations and Warranties of the Purchasers. Each Purchaser, for itself and for no other Purchaser, hereby represents and warrants as of the Closing Date to the Company as follows:

(a) Authority. The execution, delivery and performance by such Purchaser of the transactions contemplated by this Agreement have been duly authorized by all necessary corporate or similar action on the part of such Purchaser. Each Transaction Document to which it is a party has been duly executed by such Purchaser, and when delivered by such Purchaser in accordance with the terms hereof, will constitute the valid and legally binding obligation of such Purchaser, enforceable against it in accordance with its terms, except (i) as limited by general equitable principles and applicable bankruptcy, insolvency, reorganization, moratorium and other laws of general application affecting enforcement of creditors' rights generally, (ii) as limited by laws relating to the availability of specific performance, injunctive relief or other equitable remedies and (iii) insofar as indemnification and contribution provisions may be limited by applicable law.

(b) Own Account. Such Purchaser understands that the Shares are "restricted securities" and have not been registered under the Securities Act or any applicable state securities law and is acquiring the Shares as principal for its own account and not with a view to or for distributing or reselling such Shares or any part thereof in violation of the Securities Act or any applicable state securities law, has no present intention of distributing any of such Shares in violation of the Securities Act or any applicable state securities law and has no direct or indirect arrangement or understandings with any other persons to distribute or regarding the distribution of such Shares (this representation and warranty not limiting such Purchaser's right to sell the Shares pursuant to the Registration Statement or otherwise in compliance with applicable federal and state securities laws) in violation of the Securities Act or any applicable state securities law. Such Purchaser is acquiring the Shares hereunder in the ordinary course of its business. Such Purchaser understands that it may not be able to sell any of the Shares without prior registration under the Securities Act or the existence of an exemption from such registration requirement.

(c) No Conflicts. The execution, delivery and performance by such Purchaser of this Agreement and the Registration Rights Agreement and the consummation by such Purchaser of the transactions contemplated hereby and thereby will not (i) result in a violation of the organizational documents of such Purchaser, (ii) conflict with, or constitute a default (or an event which with notice or lapse of time or both would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any agreement, indenture or instrument to which such Purchaser is a party, or (iii) result in a violation of any law, rule, regulation, order, judgment or decree (including federal and state securities laws) applicable to such Purchaser, except in the case of clauses (ii) and (iii) above, for such conflicts, defaults, rights or violations which would not, individually or in the aggregate, reasonably be expected to have a material adverse effect on the ability of such Purchaser to perform its obligations hereunder.

(d) Purchaser Status. At the time such Purchaser was offered the Shares, it was, and at the date hereof is, an “accredited investor” as defined in Rule 501 under the Securities Act. Investor is not a registered broker dealer registered under Section 15(a) of the Exchange Act, or a member of the Financial Industry Regulatory Authority Inc. (“FINRA”), or an entity engaged in the business of being a broker-dealer.

(e) Experience of Such Purchaser. Such Purchaser, either alone or together with its representatives, has such knowledge, sophistication and experience in business and financial matters so as to be capable of evaluating the merits and risks of the prospective investment in the Shares, and has so evaluated the merits and risks of such investment. Such Purchaser is able to bear the economic risk of an investment in the Shares and, at the present time, is able to afford a complete loss of such investment. Such Purchaser acknowledges that it has not received any legal or tax advice from the Company or any of its representatives with respect the transactions contemplated hereby.

(f) General Solicitation. Such Purchaser is not purchasing the Shares as a result of any advertisement, article, notice or other communication regarding the Shares published in any newspaper, magazine or similar media or broadcast over television or radio or presented at any seminar or any other general solicitation or general advertisement.

(g) Access to Information. Such Purchaser acknowledges that it has had the opportunity to review any Company information and business updates requested by Purchaser and has been afforded (i) the opportunity to ask such questions as it has deemed necessary of, and to receive answers from, representatives of the Company concerning the terms and conditions of the offering of the Shares and the merits and risks of investing in the Shares and; (ii) access to information about the Company and its financial condition, results of operations, business, properties, management and prospects sufficient to enable it to evaluate its investment; and (iii) the opportunity to obtain such additional information that the Company possesses or can acquire without unreasonable effort or expense that is necessary to make an informed investment decision with respect to the investment. Such Purchaser has sought such accounting, legal and tax advice as it has considered necessary to make an informed decision with respect to its acquisition of the Shares.

(h) Certain Trading Activities. Other than with respect to the transactions contemplated herein, since the time that such Purchaser was first contacted by the Company or any other Person regarding the transactions contemplated hereby, neither the Purchaser nor any Affiliate of such Purchaser which (i) had knowledge of the transactions contemplated hereby, (ii) has or shares discretion relating to such Purchaser’s investments or trading or information concerning such Purchaser’s investments, including in respect of the Shares, and (iii) is subject to such Purchaser’s review or input concerning such Affiliate’s investments or trading (collectively, “Trading Affiliates”) has directly or indirectly, nor has any Person acting on behalf of or pursuant to any understanding with such Purchaser or Trading Affiliate, effected or agreed to effect any purchases or sales of the securities of the Company (including, without limitation, any Short Sales involving the Company’s securities). Notwithstanding the foregoing, in the case of a Purchaser and/or Trading Affiliate that is, individually or collectively, a multi-managed investment bank or vehicle whereby separate portfolio managers manage separate portions of such Purchaser’s or Trading Affiliate’s assets and the portfolio managers have no direct knowledge of the investment decisions made by the portfolio managers managing

other portions of such Purchaser's or Trading Affiliate's assets, the representation set forth above shall apply only with respect to the portion of assets managed by the portfolio manager that have knowledge about the financing transaction contemplated by this Agreement. Other than to other Persons party to this Agreement, such Purchaser has maintained the confidentiality of all disclosures made to it in connection with this transaction (including the existence and terms of this transaction).

(i) Brokers and Finders. No Person will have, as a result of the transactions contemplated by this Agreement, any valid right, interest or claim against or upon the Company or any Purchaser for any commission, fee or other compensation pursuant to any agreement, arrangement or understanding entered into by or on behalf of the Purchaser.

(j) Independent Investment Decision. Such Purchaser has independently evaluated the merits of its decision to purchase Shares pursuant to the Transaction Documents, and such Purchaser confirms that it has not relied on the advice of any other Purchaser's business and/or legal counsel in making such decision. Such Purchaser understands that nothing in this Agreement or any other materials presented by or on behalf of the Company to the Purchaser in connection with the purchase of the Shares constitutes legal, tax or investment advice. Such Purchaser has consulted such legal, tax and investment advisors as it, in its sole discretion, has deemed necessary or appropriate in connection with its purchase of the Shares.

(k) No Governmental Review. Such Purchaser understands that no United States federal or state agency or any other government or governmental agency has passed on or made any recommendation or endorsement of the Shares or the fairness or suitability of the investment in the Shares nor have such authorities passed upon or endorsed the merits of the offering of the Shares.

(l) Residency. Such Purchaser's residence (if an individual) or office in which its investment decision with respect to the Shares was made (if an entity) are located at the address immediately below such Purchaser's name on its signature page hereto.

(m) Acknowledgment. Each Purchaser acknowledges and agrees that such Purchaser has reviewed and considered prior to entering this Agreement the more detailed information about the Company and the risk factors that may affect the realization of forward-looking statements set forth in the Company's filings with the SEC, including its Annual Report on Form 10-K and its Quarterly Reports on Form 10-Q filed with the SEC.

The Company and each of the Purchasers acknowledge and agree that no party to this Agreement has made or makes any representations or warranties with respect to the transactions contemplated hereby other than those specifically set forth in this Article III and the Transaction Documents.

Article IV
OTHER AGREEMENTS OF THE PARTIES

Section 4.1 Transfer Restrictions.

(a) The Shares may only be disposed of in compliance with state and federal securities laws, including the requirement not to trade in the Shares while in possession of material non-public information. In connection with any transfer of Shares other than pursuant to an effective registration statement, to the Company or to an Affiliate of a Purchaser or in connection with a pledge as contemplated in Section 4.1(b), the Company may require the transferor thereof to provide to the Company an opinion of counsel selected by the transferor and reasonably acceptable to the Company, the form and substance of which opinion shall be reasonably satisfactory to the Company, to the effect that such transfer does not require registration of such transferred Shares under the Securities Act. As a condition of transfer, any such transferee shall agree in writing to be bound by the terms of this Agreement and shall have the rights of a Purchaser under this Agreement and the Registration Rights Agreement.

(b) The Purchasers agree to the imprinting, so long as is required by this Section 4.1

, of a legend on any of the Shares in the following form:

THIS SECURITY HAS NOT BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE IN RELIANCE UPON AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE “SECURITIES ACT”), AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OR PURSUANT TO AN AVAILABLE EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND IN ACCORDANCE WITH APPLICABLE STATE SECURITIES LAWS AS EVIDENCED BY A LEGAL OPINION OF COUNSEL TO THE TRANSFEROR TO SUCH EFFECT, THE SUBSTANCE OF WHICH SHALL BE REASONABLY ACCEPTABLE TO THE COMPANY. THIS SECURITY MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT WITH A REGISTERED BROKER-DEALER OR OTHER LOAN WITH A FINANCIAL INSTITUTION THAT IS AN “ACCREDITED INVESTOR” AS DEFINED IN RULE 501(a) UNDER THE SECURITIES ACT OR OTHER LOAN SECURED BY SUCH SECURITIES.

(c) The Company acknowledges and agrees that a Purchaser may from time to time pledge pursuant to a *bona fide* margin agreement with a registered broker-dealer or grant a security interest in some or all of the Shares to a financial institution that is an “accredited investor” as defined in Rule 501(a) under the Securities Act and who agrees to be bound by the provisions of this Agreement and the Registration Rights Agreement and, if required under the terms of such arrangement, such Purchaser may transfer pledged or secured Shares to the pledgees or secured parties. Such a

pledge or transfer would not be subject to approval of the Company and no legal opinion of legal counsel of the pledgee, secured party or pledgor shall be required in connection therewith. Further, no notice shall be required of such pledge. At the appropriate Purchaser's expense, the Company will execute and deliver such reasonable documentation as a pledgee or secured party of Shares may reasonably request in connection with a pledge or transfer of the Shares, including, if the Shares are subject to registration pursuant to the Registration Rights Agreement, the preparation and filing of any required prospectus supplement under Rule 424(b)(3) under the Securities Act or other applicable provision of the Securities Act to appropriately amend the list of Selling Stockholders thereunder.

(d) Certificates evidencing the Shares shall not contain any legend (including the legend set forth in Section 4.1(b)), (i) while a registration statement (including the Registration Statement) covering the resale of such Shares is effective under the Securities Act, or (ii) following any sale of such Shares pursuant to Rule 144, or (iii) if such Shares are eligible for sale under Rule 144, or (iv) if such legend is not required under applicable requirements of the Securities Act (including judicial interpretations and pronouncements issued by the staff of the Commission). The Company shall cause its counsel to issue a legal opinion to the Transfer Agent promptly after the Effective Date if required by the Transfer Agent to effect the removal of the legend hereunder. The Company agrees that following the Effective Date or at such time as such legend is no longer required under this Section 4.1(d), it will, no later than three Trading Days following the delivery by a Purchaser to the Company or the Transfer Agent of a certificate representing Shares issued with a restrictive legend (such third Trading Day, the “Legend Removal Date”), deliver or cause to be delivered to such Purchaser a certificate representing such shares that is free from all restrictive and other legends. The Company may not make any notation on its records or give instructions to the Transfer Agent that enlarge the restrictions on transfer set forth in this Section. Certificates for Shares subject to legend removal hereunder shall be transmitted by the Transfer Agent to the Purchasers by crediting the account of the Purchaser’s prime broker with the Depository Trust Company System, if the Transfer Agent is a participant in the DWAC system, and otherwise by physical delivery of certificates as directed by the Purchaser.

(e) Each Purchaser, severally and not jointly with the other Purchasers, agrees that the removal of the restrictive legend from certificates representing Shares as set forth in this Section 4.1 is predicated upon the Company’s reliance that the Purchaser will sell any Shares pursuant to either the registration requirements of the Securities Act, including any applicable prospectus delivery requirements, or an exemption therefrom, and that if Shares are sold pursuant to a Registration Statement, they will be sold in compliance with the plan of distribution set forth therein.

Section 4.2 Furnishing of Information. For a period of one year after the date of this Agreement, the Company covenants to timely file (or obtain extensions in respect thereof and file within the applicable grace period) all reports required to be filed by the Company after the date hereof pursuant to the Exchange Act. During this one-year period, if the Company is not required to file reports pursuant to the Exchange Act, it will prepare and furnish to the Purchasers and make publicly available in accordance with Rule 144 such information as is required for the Purchasers to sell the Shares under Rule 144. The Company further covenants that it will take such further action as any holder of Shares may reasonably request, to the extent required from time to time to enable such Person to sell such Shares without registration under the Securities Act within the requirements of the exemption provided by Rule 144.

Section 4.3 Integration. The Company shall not sell, offer for sale or solicit offers to buy or otherwise negotiate in respect of any security (as defined in Section 2.1 of the Securities Act) that could reasonably be expected to be integrated with the offer or sale of the Shares in a manner that would require the registration under the Securities Act of the sale of the Shares to the Purchasers or that would be integrated with the offer or sale of the Shares for purposes of the rules and regulations of any Trading Market such that it would require shareholder approval prior to the closing of such other transaction unless shareholder approval is obtained before the closing of such subsequent transaction.

Section 4.4 Securities Laws Disclosure; Publicity. On or before 9:00 a.m., New York City time, on the Business Day immediately following the date hereof, the Company shall issue a press release (the "Press Release") reasonably acceptable to the Placement Agent disclosing all material terms of the transactions contemplated hereby. On or before 5:30 p.m., New York City time, on the fourth Trading Day immediately following the execution of this Agreement, the Company will file a Current Report on Form 8-K with the Commission describing the terms of the Transaction Documents (and including as exhibits to such Current Report on Form 8-K the material Transaction Documents (including, without limitation, this Agreement, the form of Warrant and the Registration Rights Agreement)). Notwithstanding the foregoing, the Company shall not publicly disclose the name of any Purchaser or an Affiliate of any Purchaser, or include the name of any Purchaser or an Affiliate of any Purchaser in any press release or filing with the Commission (other than the Registration Statement) or any regulatory agency or Trading Market, without the prior written consent of such Purchaser, except (i) as required by federal securities law in connection with (A) any registration statement contemplated by the Registration Rights Agreement and (B) the filing of final Transaction Documents (including signature pages thereto) with the Commission and (ii) to the extent such disclosure is required by law, request of the Staff of the Commission or Trading Market regulations, in which case the Company shall provide the Purchasers with prior written notice of such disclosure permitted under this subclause (ii). From and after the issuance of the Press Release, no Purchaser shall be in possession of any material, non-public information received from the Company or any of its officers, directors, employees or agents, that is not disclosed in the Press Release. Each Purchaser, severally and not jointly with the other Purchasers, covenants that it will comply with the provisions of any confidentiality or nondisclosure agreement executed by it and, in addition, until such time as the transactions contemplated by this Agreement are required to be publicly disclosed by the Company as described in this Section 4.4, such Purchaser will maintain the confidentiality of all disclosures made to it in connection with this transaction (including the existence and terms of this transaction).

Section 4.5 Indemnification of Purchasers.

(a) In addition to the indemnity provided in the Registration Rights Agreement, the Company will indemnify and hold each Purchaser and its directors, officers, stockholders, members, partners, employees and agents (and any other Persons with a functionally equivalent role of a Person holding such titles notwithstanding a lack of such title or any other title), each Person who controls such Purchaser (within the meaning of Section 15 of the Securities Act and Section 20 of the Exchange Act), and the directors, officers, stockholders, agents, members, partners or employees (and any other Persons with a functionally equivalent role of a Person holding such titles notwithstanding a lack of such title or any other title) of such controlling person (each, a “Purchaser Party”) harmless from any and all losses, liabilities, obligations, claims, contingencies, damages, costs and expenses, including all judgments, amounts paid in settlements, court costs and reasonable attorneys’ fees and costs of investigation that any such Purchaser Party may suffer or incur as a result of any breach of any of the representations, warranties, covenants or agreements made by the Company in this Agreement or in the other Transaction Documents. The Company will not be liable to any Purchaser Party under this Agreement to the extent, but only to the extent that a loss, claim, damage or liability is attributable to any Purchaser Party’s breach of any of the representations, warranties, covenants or agreements made by such Purchaser Party in this Agreement or in the other Transaction Documents; provided that such a claim for indemnification relating to any breach of any of the representations or warranties made by the Company in this Agreement is made within one year from the Closing

(b) Promptly after receipt by any Person (the “Indemnified Person”) of notice of any demand, claim or circumstances which would or might give rise to a claim or the commencement of any action, proceeding or investigation in respect of which indemnity may be sought pursuant to Section 4.5(a), such Indemnified Person shall promptly notify the Company in writing and the Company shall assume the defense thereof, including the employment of counsel reasonably satisfactory to such Indemnified Person, and shall assume the payment of all fees and expenses; *provided, however*, that the failure of any Indemnified Person so to notify the Company shall not relieve the Company of its obligations hereunder except to the extent that the Company is actually and materially and adversely prejudiced by such failure to notify. In any such proceeding, any Indemnified Person shall have the right to retain its own counsel, but the fees and expenses of such counsel shall be at the expense of such Indemnified Person unless: (i) the Company and the Indemnified Person shall have mutually agreed to the retention of such counsel; (ii) the Company shall have failed promptly to assume the defense of such proceeding and to employ counsel reasonably satisfactory to such Indemnified Person in such proceeding; or (iii) in the reasonable judgment of counsel to such Indemnified Person, representation of both parties by the same counsel would be inappropriate due to actual or potential differing interests between them. The Company shall not be liable for any settlement of any proceeding effected without its written consent, which consent shall not be unreasonably withheld, delayed or conditioned. Without the prior written consent of the Indemnified Person, which consent shall not be unreasonably withheld, delayed or conditioned, the Company shall not effect any settlement of any pending or threatened proceeding in respect of which any Indemnified Person is or could have been a party and indemnity could have been sought hereunder by such Indemnified Party, unless such settlement includes an unconditional release of such Indemnified Person from all liability arising out of such proceeding.

Section 4.6 Reservation of Common Stock. As of the date hereof, the Company has reserved and the Company shall continue to reserve and keep available at all times, a sufficient number of shares of Common Stock for the

purpose of enabling the Company to issue Shares pursuant to this Agreement.

Section 4.7 Listing or Quotation of Common Stock. The Company's common stock is currently quoted on the NYSE MKT. The Company hereby agrees to use best efforts to maintain the listing or quotation of the Common Stock on a Trading Market, and as soon as reasonably practicable following the Closing (but not later than the earlier of the Effective Date and the first anniversary of the Closing Date) to list all of the Shares on such Trading Market, as may be applicable. The Company further agrees, if the Company applies to have the Common Stock traded on any other Trading Market, it will include in such application all of the Shares, and will take such other action as is necessary to cause all of the Shares to be listed on such other Trading Market as promptly as possible. The Company will take all action reasonably necessary to continue the listing and trading of its Common Stock on a Trading Market and will comply in all respects with the Company's reporting, filing and other obligations under the bylaws or rules of the Trading Market.

Section 4.8 Equal Treatment of Purchasers. No consideration shall be offered or paid to any Person to amend or consent to a waiver or modification of any provision of any of the Transaction Documents unless the same consideration is also offered to all of the parties to the Transaction Documents. For clarification purposes, this provision constitutes a separate right granted to each Purchaser by the Company and negotiated separately by each Purchaser, and is intended for the Company to treat the Purchasers as a class and shall not in any way be construed as the Purchasers acting in concert or as a group with respect to the purchase, disposition or voting of Shares or otherwise.

Section 4.9 Confidentiality After The Date Hereof. Each Purchaser, severally and not jointly with the other Purchasers, covenants that until such time as the transactions contemplated by this Agreement and such other material non-public information related to the Company in possession of the Purchaser are publicly disclosed by the Company as described in Section 4.4, such Purchaser will maintain the confidentiality of all disclosures made to it in connection with this transaction (including the existence and terms of this transaction).

Section 4.10 Delivery of Shares After Closing. The Company shall deliver, or cause to be delivered, the respective Shares purchased by each Purchaser to such Purchaser within three Trading Days of the date approval has been received by the NYSE MKT which approval shall be requested immediately after execution of this Agreement (unless such Purchaser has specified to the Company at the time of execution of this Agreement that it shall settle "delivery versus payment" in which case such Shares shall be delivered on or prior to the Closing Date).

Section 4.11 Form D; Blue Sky Filings. The Company agrees to timely file a Form D with respect to the Shares as required under Regulation D and to provide a copy thereof, promptly upon request of any Purchaser. The Company shall take such action as the Company shall reasonably determine is necessary in order to obtain an exemption for, or to qualify the Shares for, sale to the Purchasers at the Closing under applicable securities or "Blue Sky" laws of the states of the United States, and shall provide evidence of such actions promptly upon request of any Purchaser.

Section 4.12 Use of Proceeds. The Company intends to use the net proceeds of this offering after payment of placement agent commissions and other expenses of the offering for the funding of: general research and development activities including the Exclusive Channel Collaboration with Intrexon Corporation and the Company's clinical trial programs; and, general corporate purposes and shall not use such proceeds for the satisfaction of any portion of the Company's debt (other than trade payables in the ordinary course of the Company's business and prior practices), or to redeem any Common Stock or Common Stock Equivalents.

Article V
MISCELLANEOUS

Section 5.1 Fees and Expenses. Except as expressly set forth in the Transaction Documents to the contrary, each party shall pay the fees and expenses of its advisers, counsel, accountants and other experts, if any, and all other expenses incurred by such party incident to the negotiation, preparation, execution, delivery and performance of this Agreement. The Company shall pay all Transfer Agent fees, stamp taxes and other taxes and duties levied in connection with the delivery of the Shares to the Purchasers.

Section 5.2 Entire Agreement. The Transaction Documents, together with the exhibits and schedules thereto, contain the entire understanding of the parties with respect to the subject matter hereof and supersede all prior agreements and understandings, oral or written, with respect to such matters, which the parties acknowledge have been merged into such documents, exhibits and schedules. At or after the Closing, and without further consideration, the Company and the Purchasers will execute and deliver to the other such further documents as may be reasonably requested in order to give practical effect to the intention of the parties under the Transaction Documents.

Section 5.3 Notices. Any and all notices or other communications or deliveries required or permitted to be provided hereunder shall be in writing and shall be deemed given and effective on the earliest of (a) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number set forth on the signature pages attached hereto prior to 5:30 p.m. (New York City time) on a Trading Day, (b) the next Trading Day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number set forth on the signature pages attached hereto on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (c) the 2nd Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (d) upon actual receipt by the party to whom such notice is required to be given. The address for such notices and communications shall be as set forth on the signature pages attached hereto.

Section 5.4 Amendments; Waivers. No provision of this Agreement may be waived or amended except in a written instrument signed, in the case of an amendment, by the Company and each Purchaser. No waiver of any default with respect to any provision, condition or requirement of this Agreement shall be deemed to be a continuing waiver in the future or a waiver of any subsequent default or a waiver of any other provision, condition or requirement hereof, nor shall any delay or omission of either party to exercise any right hereunder in any manner impair the exercise of any such right. No consideration shall be offered or paid to any Purchaser to amend or consent to a waiver or modification of any provision of any Transaction Document unless the same consideration is also offered to all Purchasers who then hold Securities.

Section 5.5 Headings and Construction. The headings herein are for convenience only, do not constitute a part of this Agreement and shall not be deemed to limit or affect any of the provisions hereof. The language used in this Agreement will be deemed to be the language chosen by the parties to express their mutual intent, and no rules of

strict construction will be applied against any party. This Agreement shall be construed as if drafted jointly by the parties, and no presumption or burden of proof shall arise favoring or disfavoring any party by virtue of the authorship of any provisions of this Agreement or any of the Transaction Documents.

Section 5.6 Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties and their successors and permitted assigns. The Company may not assign this Agreement or any rights or obligations hereunder without the prior written consent of each Purchaser (other than by merger). Any Purchaser may assign any or all of its rights under this Agreement to any Person to whom such Purchaser assigns or transfers any Shares, provided such transferee agrees in writing to be bound, with respect to the transferred Shares, by the provisions of the Transaction Documents that apply to the “Purchasers.”

Section 5.7 No Third-Party Beneficiaries. This Agreement is intended for the benefit of the parties hereto and their respective successors and permitted assigns and is not for the benefit of, nor may any provision hereof be enforced by, any other Person.

Section 5.8 Governing Law. All questions concerning the construction, validity, enforcement and interpretation of the Transaction Documents shall be governed by and construed and enforced in accordance with the internal laws of the State of New York (including Sections 5-1401 and 5-1402 of the New York General Obligations Law but excluding all other choice of law and conflicts of law rules). Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Agreement and any other Transaction Documents (whether brought against a party hereto or its respective affiliates, directors, officers, shareholders, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law.

Section 5.9 Survival. The representations and warranties contained herein shall survive the Closing and the delivery of the Shares.

Section 5.10 Execution. This Agreement may be executed in two or more counterparts, all of which when taken together shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other party, it being understood that both parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a “.pdf” format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or “.pdf” signature page were an original thereof.

Section 5.11 Severability. If any term, provision, covenant or restriction of this Agreement is held by a court of competent jurisdiction to be invalid, illegal, void or unenforceable, the remainder of the terms, provisions, covenants and restrictions set forth herein shall remain in full force and effect and shall in no way be affected, impaired or invalidated, and the parties hereto shall use their commercially reasonable efforts to find and employ an alternative means to achieve the same or substantially the same result as that contemplated by such term, provision, covenant or restriction. It is hereby stipulated and declared to be the intention of the parties that they would have executed the remaining terms, provisions, covenants and restrictions without including any of such that may be hereafter declared invalid, illegal, void or unenforceable.

Section 5.12 Rescission and Withdrawal Right. Notwithstanding anything to the contrary contained in (and without limiting any similar provisions of) any of the other Transaction Documents, whenever any Purchaser exercises a right, election, demand or option under a Transaction Document and the Company does not timely and materially perform its related obligations within the periods therein provided, then such Purchaser may rescind or withdraw, in its sole discretion from time to time upon written notice to the Company, any relevant notice, demand or election in whole or in part without prejudice to its future actions and rights.

Section 5.13 Replacement of Shares. If any certificate or instrument evidencing any Shares is mutilated, lost, stolen or destroyed, the Company shall issue or cause to be issued in exchange and substitution for and upon cancellation thereof, or in lieu of and substitution therefor, a new certificate or instrument, but only upon receipt of evidence reasonably satisfactory to the Company and the Transfer Agent of such loss, theft or destruction and the execution by the holder thereof of a customary lost certificate affidavit of that fact and an agreement to indemnify and hold harmless the Company and the Transfer Agent for any losses in connection therewith or, if required by the Transfer Agent, a bond in such form and amount as is required by the Transfer Agent. The applicants for a new certificate or instrument under such circumstances shall also pay any reasonable third-party costs associated with the issuance of such replacement Shares. If a replacement certificate or instrument evidencing any Shares is requested due to a mutilation thereof, the Company may require delivery of such mutilated certificate or instrument as a condition precedent to any issuance of a replacement.

Section 5.14 Remedies. In addition to being entitled to exercise all rights provided herein or granted by law, including recovery of damages, each of the Purchasers and the Company will be entitled to specific performance under the Transaction Documents. The parties agree that monetary damages may not be adequate compensation for any loss incurred by reason of any breach of obligations contained in the Transaction Documents and hereby agrees to

waive and not to assert in any action for specific performance of any such obligation the defense that a remedy at law would be adequate.

Section 5.15 Payment Set Aside. To the extent that the Company makes a payment or payments to any Purchaser pursuant to any Transaction Document or a Purchaser enforces or exercises its rights thereunder, and such payment or payments or the proceeds of such enforcement or exercise or any part thereof are subsequently invalidated, declared to be fraudulent or preferential, set aside, recovered from, disgorged by or are required to be refunded, repaid or otherwise restored to the Company, a trustee, receiver or any other person under any law (including, without limitation, any bankruptcy law, state or federal law, common law or equitable cause of action), then to the extent of any such restoration the obligation or part thereof originally intended to be satisfied shall be revived and continued in full force and effect as if such payment had not been made or such enforcement or setoff had not occurred.

Section 5.16 Independent Nature of Purchasers' Obligations and Rights. The obligations of each Purchaser under any Transaction Document are several and not joint with the obligations of any other Purchaser, and no Purchaser shall be responsible in any way for the performance or non-performance of the obligations of any other Purchaser under any Transaction Document. Nothing contained herein or in any other Transaction Document, and no action taken by any Purchaser pursuant thereto, shall be deemed to constitute the Purchasers as a partnership, an association, a joint venture or any other kind of entity, or create a presumption that the Purchasers are in any way acting in concert or as a group with respect to such obligations or the transactions contemplated by the Transaction Documents. Each Purchaser shall be entitled to independently protect and enforce its rights, including without limitation, the rights arising out of this Agreement or out of the other Transaction Documents, and it shall not be necessary for any other Purchaser to be joined as an additional party in any proceeding for such purpose. Each Purchaser has been represented by its own separate legal counsel in their review and negotiation of the Transaction Documents. The Company has elected to provide all Purchasers with the same terms and Transaction Documents for the convenience of the Company and not because it was required or requested to do so by the Purchasers.

Section 5.17 Liquidated Damages. The Company's obligations to pay any partial liquidated damages or other amounts owing under the Transaction Documents is a continuing obligation of the Company and shall not terminate until all unpaid partial liquidated damages and other amounts have been paid notwithstanding the fact that the instrument or security pursuant to which such partial liquidated damages or other amounts are due and payable shall have been canceled.

Section 5.18 Massachusetts Business Trust. A copy of the Declaration of Trust of each Purchaser that is a Massachusetts Business Trust, as applicable, or any affiliate thereof, is on file with the Secretary of State of the Commonwealth of Massachusetts and notice is hereby given that this Agreement is executed on behalf of the trustees of such Purchaser or any affiliate thereof as trustees and not individually and that the obligations of this Agreement are not binding on any of the trustees, officers or stockholders of such Purchaser or any affiliate thereof individually but are binding only upon such Purchaser or any affiliate thereof and its assets and property.

Section 5.19 No Promotion. The Company agrees that it will not, and shall cause each of its Subsidiaries to not, without the prior written consent of a Purchaser, use in advertising, publicity, or otherwise the name of such Purchaser, or any partner or employee of such Purchaser, nor any trade name, trademark, trade device, service mark, symbol or any abbreviation, contraction or simulation thereof owned by such Purchaser or any of their respective affiliates. The Company further agrees that it shall obtain the written consent of such Purchaser prior to the Company's or any of its Subsidiaries' issuance of any public statement detailing the purchase of Shares by Purchasers pursuant to this Agreement.

Section 5.20 Construction. The parties agree that each of them and/or their respective counsel has reviewed and had an opportunity to revise the Transaction Documents and, therefore, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of the Transaction Documents or any amendments hereto.

Section 5.21 Exculpation Among Purchasers. Each Purchaser acknowledges that it is not relying upon any person, firm or corporation (including without limitation any other Purchaser), other than the Company and its officers and directors (acting in their capacity as representatives of the Company), in deciding to invest and in making its investment in the Company. Each Purchaser agrees that no other Purchaser nor the respective controlling persons, officers, directors, partners, agents or employees of any other Purchaser shall be liable to such Purchaser for any losses incurred by such Purchaser in connection with its investment in the Company.

Section 5.22 Company Acknowledgement. The Company acknowledges and agrees that (i) each of the Purchasers is participating in the transactions contemplated by this Agreement and the other Transaction Documents at the Company's request and the Company has concluded that such participation is in the Company's best interest and is consistent with the Company's objectives and (ii) each of the Purchasers is acting solely in the capacity of an arm's length purchaser. The Company further acknowledges that no Purchaser is acting or has acted as an advisor, agent or fiduciary of the Company (or in any similar capacity) with respect to this Agreement or the other Transaction Documents and any advice given by any Purchaser or any of its respective representatives in connection with this Agreement or the other Transaction Documents is merely incidental to the Purchasers' purchase of Shares. The Company further represents to each Purchaser that the Company's decision to enter into this Agreement has been based solely on the independent evaluation of the transactions contemplated hereby by the Company and its representatives.

(Signature Pages Follow)

IN WITNESS WHEREOF, the parties hereto have caused this Stock Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

SYNTHETIC BIOLOGICS, INC.

By

Name:

Title:

With a copy to (which shall not constitute notice):

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK;

SIGNATURE PAGE FOR PURCHASER FOLLOWS]

IN WITNESS WHEREOF, the undersigned have caused this Stock Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser:

Signature of Authorized Signatory of Purchaser:

Name of Authorized Signatory:

Title of Authorized Signatory:

Total Subscription Amount: \$_____

Address for Notice of Purchaser:

Address for Delivery of Shares for Purchaser (if not same as above):

Exhibit A

Registration Rights Agreement

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Exhibit B

Form of Legal Opinion of Company Counsel

Based upon and subject to the foregoing, it is our opinion as of this date that:

1. Based solely upon the certificate of good standing, dated October [], 2012, issued by the State of Nevada, the Company is a corporation validly existing and in good standing under the laws of the State of Nevada.

2. The Company has the corporate power and authority to execute, deliver and perform its obligations under the Transaction Documents, including, without limitation, to issue and deliver the Shares as contemplated by the Agreement. Each of the Transaction Documents has been duly authorized by all necessary corporate action and each has been duly executed and delivered on behalf of the Company, and each is a legal, valid and binding obligation of the Company enforceable against the Company in accordance with its terms.

3. The execution and delivery by the Company of the Transaction Documents, and the performance by the Company of its obligations thereunder as of the date hereof, do not violate the Company's Articles of Incorporation or Bylaws, do not constitute a default under or a material breach of any material agreement of the Company that has not otherwise been waived and, to our knowledge, do not (a) violate any U. S. Federal or state statute, rule or regulation applicable to the transactions contemplated by the Transaction Documents or (b) violate any order, writ, judgment, injunction, decree, determination or award which has been entered against the Company and of which such counsel is aware, except, with respect to clauses (a) and (b), where such violation would not materially and adversely affect the Company.

4. The Company has the authorized capital stock as set forth in the SEC Documents. The Shares have been duly authorized, and when issued and sold in accordance with the Stock Purchase Agreement, will be validly issued and non-assessable.

5. No approval, authorization or other action by, or notice to or filing with, any governmental authority is required in connection with the execution, delivery and performance by the Company of the Transaction Documents, except (a) those that have been obtained or made and are in full force and effect, and (b) any filings required by Regulation D promulgated under the Securities Act of 1933, as amended, or by state securities laws.

6. To our knowledge, there is no action, proceeding or investigation pending or overtly threatened against the Company before any court or administrative agency that questions the validity of the Transaction Documents or that could reasonably be expected to result, either individually or in the aggregate, in a material adverse effect on the Company.

7. Assuming the truth and accuracy of the representations made by the Company and the Purchasers in the Stock Purchase Agreement, the sale and issuance of the Shares in conformity with the terms of the Transaction Documents constitute transactions that are exempt from the registration requirements of the Securities Act of 1933, as amended, subject to the timely filing of a Form D pursuant to Regulation D.

8. The Company is not, after giving effect to the issuance of the Shares, an “investment company” as defined in the Investment Company Act of 1940, as amended.

9. To our knowledge and except as set forth in the SEC Documents with respect to Intrexon Corporation, there are no written contracts, agreements or understandings between the Company and any person granting such person the right (other than rights which have been waived in writing or otherwise satisfied) to require the Company to include any securities of the Company in any registration statement.

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REGISTRATION RIGHTS AGREEMENT

This Registration Rights Agreement (this “Agreement”) is made and entered into as of October 25, 2012 between Synthetic Biologics, Inc., a Nevada corporation (the “Company”) and each of the several purchasers signatory hereto (each such purchaser, a “Purchaser” and, collectively, the “Purchasers”).

This Agreement is made pursuant to the Stock Purchase Agreement, dated as of the date hereof, between the Company and each Purchaser (the “Purchase Agreement”).

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Company and each of the Holders agree as follows:

1. Definitions

Capitalized terms used and not otherwise defined herein that are defined in the Purchase Agreement shall have the meanings given such terms in the Purchase Agreement. As used in this Agreement, the following terms shall have the following meanings:

“415 Cutback Shares” has the meaning set forth in Section 2(a).

“Advice” has the meaning set forth in Section 6(d).

“Affiliate” means, with respect to any person, any other person which directly or indirectly controls, is controlled by, or is under common control with, such person.

“Agreement” has the meaning set forth in the Preamble.

“Business Day” means a day, other than a Saturday or Sunday, on which banks in New York City are open for the general transaction of business.

“Closing” has the meaning set forth in the Purchase Agreement.

“Closing Date” has the meaning set forth in the Purchase Agreement.

“Commission” means the Securities and Exchange Commission.

“Common Stock” means the common stock of the Company, par value \$0.01 per share, and any securities into which such common stock may hereinafter be reclassified.

“Company” has the meaning set forth in the Preamble.

“Effective Date” means each date that the Registration Statement filed pursuant to Section 2(a) and any post-effective amendment thereto is declared effective by the Commission.

“Effectiveness Deadline” means, with respect to the Initial Registration Statement or the New Registration Statement, the 90th calendar day following the Closing Date (or, in the event the Commission reviews and has written comments to the Initial Registration Statement or the New Registration Statement, the 120th calendar day following the Closing Date); *provided, however*, that if the Company is notified by the Commission that the Initial Registration Statement or the New Registration Statement will not be reviewed or is no longer subject to further review and comments, the Effectiveness Deadline as to such Registration Statement shall be the 5th Trading Day following the date on which the Company is so notified if such date precedes the dates otherwise required above; *provided, further*, that if the Effectiveness Deadline falls on a Saturday, Sunday or other day that the Commission is closed for business, the Effectiveness Deadline shall be extended to the next Business Day on which the Commission is open for business.

“Effectiveness Period” has the meaning set forth in Section 2(b).

“Event” has the meaning set forth in Section 2(c).

“Event Date” has the meaning set forth in Section 2(c).

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Filing Deadline” means, with respect to the Initial Registration Statement required to be filed pursuant to Section 2(a), the 45th calendar day following the Closing Date and with respect to any Remainder Registration Statement required pursuant to Section 2(a), the earliest practical date on which the Company is permitted by SEC Guidance to file such Remainder Registration Statement related to Registrable Securities; *provided, however*, that if the Filing Deadline falls on a Saturday, Sunday or other day that the Commission is closed for business, the Filing Deadline shall be

extended to the next business day on which the Commission is open for business.

“Holder” or “Holders” means the holder or holders, as the case may be, from time to time of Registrable Securities.

“Indemnified Party” has the meaning set forth in Section 5(c).

“Indemnifying Party” has the meaning set forth in Section 5(c).

“Initial Registration Statement” means the initial Registration Statement filed pursuant to this Agreement.

“Losses” has the meaning set forth in Section 5(a).

“Plan of Distribution” has the meaning set forth in Section 2(a).

“Prospectus” means the prospectus included in a Registration Statement (including, without limitation, a prospectus that includes any information previously omitted from a prospectus filed as part of an effective registration statement in reliance upon Rule 430A promulgated under the Securities Act), as amended or supplemented by any prospectus supplement, with respect to the terms of the offering of any portion of the Registrable Securities covered by a Registration Statement, and all other amendments and supplements to the Prospectus, including post-effective amendments, and all material incorporated by reference or deemed to be incorporated by reference in such Prospectus.

“Registrable Securities” means (i) all Shares and (ii) any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to the foregoing, *provided*, that the Holder has completed and delivered to the Company a Selling Shareholder Questionnaire. Notwithstanding the foregoing, the Shares and the securities will cease to be Registrable Securities of a particular Holder upon the earliest of (v) when they have been effectively registered under the Securities Act and disposed of in accordance with a Registration Statement covering them, (w) when they have been sold to the public pursuant to Rule 144 (or by similar provision under the Securities Act) (in which case, only such security sold by the Holder shall cease to be a Registrable Security), , or (x) when they are otherwise transferred and such securities may be resold without subsequent registration under the Securities Act.

“Registration Statement” means any one or more registration statements of the Company filed under the Securities Act that covers the resale of any of the Registrable Securities pursuant to the provisions of this Agreement (including, without limitation, the Initial Registration Statement, the New Registration Statement and any Remainder Registration Statements), including (in each case) the amendments and supplements to such Registration Statements, including pre- and post-effective amendments thereto, all exhibits and all material incorporated by reference or deemed to be incorporated by reference in such Registration Statements.

“Remainder Registration Statement” has the meaning set forth in Section 2(a).

“Rule 144” means Rule 144 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended from time to time, or any similar rule or regulation hereafter adopted by the Commission having

substantially the same effect as such Rule.

“Rule 415” means Rule 415 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

“Rule 424” means Rule 424 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

“Selling Shareholder Questionnaire” has the meaning set forth in Section 2(d).

“SEC Guidance” means (i) any publicly-available written or oral guidance, comments, requirements or requests of the Staff and (ii) the Securities Act.

“Securities Act” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“Staff” means the staff of the Commission.

“Trading Day” means (i) a day on which the Common Stock is listed or quoted and traded on its Principal Market (other than the NYSE MKT), or (ii) if the Common Stock is not listed on a Trading Market (other than the NYSE MKT), a day on which the Common Stock is traded in the over-the-counter market, as reported by the NYSE MKT, or (iii) if the Common Stock is not quoted on any Trading Market, a day on which the Common Stock is quoted in the over-the-counter market as reported in the “pink sheets” by Pink Sheets LLC (or any similar organization or agency succeeding to its functions of reporting prices); *provided*, that in the event that the Common Stock is not listed or quoted as set forth in (i), (ii) and (iii) hereof, then Trading Day shall mean a Business Day.

“Trading Market” means whichever of the NYSE, the NYSE MKT, the NASDAQ Global Select Market, the NASDAQ Global Market, the NASDAQ Capital Market or the OTC Bulletin Board on which the Common Stock is listed or quoted for trading on the date in question.

2. Required Registration

(a) On or prior to the Filing Deadline, the Company shall prepare and file with the Commission a Registration Statement covering the resale of all of the Registrable Securities not already covered by an existing and effective Registration Statement for an offering to be made on a continuous basis pursuant to Rule 415 or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (the “*Initial Registration Statement*”). The Initial Registration Statement shall be on Form S-1 (or such other form available to register for resale the Registrable Securities as a secondary offering) and shall contain (except if otherwise required pursuant to written comments received from the Commission upon a review of such Registration Statement) a “Plan of Distribution” section substantially in the form attached hereto as Annex A (which may be modified to respond to comments, if any, provided by the Commission). Notwithstanding the registration obligations set forth in this Section 2, in the event the Commission informs the Company that all of the Registrable Securities cannot, as a result of the application of Rule 415, be registered for resale as a secondary offering on a single registration statement, the Company agrees to promptly (i) inform each of the Holders thereof and use its commercially reasonable efforts to file amendments to the Initial Registration Statement as required by the Commission and/or (ii) withdraw the Initial Registration Statement and file a new registration statement (a “*New Registration Statement*”), in either case covering the maximum number of Registrable Securities permitted to be registered by the Commission, on Form S-1 or such other form available to register for resale the Registrable Securities as a secondary offering; *provided, however*, that prior to filing such amendment or New Registration Statement, the Company shall be obligated to use its commercially reasonable efforts to advocate with the Commission for the registration of all of the Registrable Securities in accordance with SEC Guidance, including without limitation, the Manual of Publicly Available Telephone Interpretations D.29 and Compliance and Disclosure Interpretations. Notwithstanding any other provision of this Agreement, if any SEC Guidance sets forth a limitation of the number of Registrable Securities permitted to be registered on a particular Registration Statement as a secondary offering (and notwithstanding that the Company used commercially reasonable efforts to advocate with the Commission for the registration of all or a greater number of Registrable Securities), or in the event the Staff seeks to characterize any offering pursuant to a Registration Statement filed pursuant to this Agreement as constituting an offering of securities by or on behalf of the Company such that Rule 415 is not available to the Company to register the resale of such Registrable Securities and as a result the Staff or the SEC does not permit such Registration Statement to become effective and used for resales in a manner that permits the continuous resale at the market by the Holders participating therein (or as otherwise may be acceptable to each Holder) without being named therein as an “underwriter,” unless otherwise directed in writing by a Holder as to its Registrable Securities, the number of Registrable Securities to be registered on such Registration Statement will be reduced by the Shares (applied, in the case that some Shares may be registered, to the Holders on a pro rata basis based on the total number of unregistered Shares held by such Holders), subject to a determination by the Commission that certain Holders must be reduced first based on the number of Registrable Securities held by such Holders (such reduced Registrable Securities, the “415 Cutback Shares”). In the event the Company amends the Initial Registration Statement or files a New Registration Statement, as the case may be, under clauses (i) or (ii) above, the Company will use its commercially reasonable efforts to file with the Commission, as promptly as allowed by Commission or SEC Guidance provided to the Company or to registrants of securities in general, one or more registration statements on Form S-1 or such other form available to register for resale those Registrable Securities that were not registered for resale on the Initial Registration Statement, as amended, or the New Registration Statement, including the 415 Cutback Shares (the “*Remainder Registration Statements*”). No Holder shall be named as an “underwriter” in any Registration Statement without such Holder’s prior written consent. The Company may include in a Registration Statement any shares underlying any warrants issued to the placement agents in the transactions contemplated hereby, provided, that if any Registrable Securities are required to be cut back, then such placement agent shares shall be cut back prior to any Registrable

Securities held by any Holder. The Company has entered into registration rights agreements with Intrexon Corporation (“Intrexon”) which require the Company to include shares issued to Intrexon in a registration statement to be subsequently filed with the SEC in accordance with the terms of the First Amendment to Registration Rights Agreement (the “First Amendment”) dated August 6, 2012 between Intrexon and the Company filed with the SEC as an exhibit to the Company’s Current Report on Form 8-K on August 9, 2012. Certain affiliates of the principal of Intrexon have agreed to waive their rights under this Agreement and in lieu thereof have agreed to be included as parties to the First Amendment. .

(b) The Company shall use its commercially reasonable efforts to cause each Registration Statement or any post-effective amendment thereto to be declared effective by the Commission as soon as practicable and, with respect to the Initial Registration Statement or the New Registration Statement, as applicable, no later than the Effectiveness Deadline (including, with respect to the Initial Registration Statement or the New Registration Statement, as applicable, filing with the Commission a request for acceleration of effectiveness in accordance with Rule 461 promulgated under the Securities Act within five (5) Business Days after the date that the Company is notified (orally or in writing, whichever is earlier) by the Commission that such Registration Statement will not be “reviewed,” or not be subject to further review and the effectiveness of such Registration Statement may be accelerated), shall use its commercially reasonable efforts to keep each Registration Statement continuously effective under the Securities Act until the earlier of (i) such time as all of the Registrable Securities covered by such Registration Statement have been publicly sold by the Holders or (ii) the date that is one (1) year following the Closing Date (the “*Effectiveness Period*”). The Company shall promptly notify the Holders via facsimile or electronic mail of the effectiveness of a Registration Statement or any post-effective amendment thereto on or before the first Trading Day after the date that the Company telephonically confirms effectiveness with the Commission. The Company shall, by 9:30 a.m. New York City time on the first Trading Day after the Effective Date, file a final Prospectus with the Commission, as required by Rule 424(b).

(c) If: (i) the Initial Registration Statement is not filed on or prior to its Filing Deadline (if the Company files the Initial Registration Statement without affording the Holders the opportunity to review and comment on the same as required by Section 3(a) herein, the Company shall be deemed to have not satisfied this clause (i)), (ii) the Company fails to have the a Registration Statement declared effective under the Securities Act prior to the applicable Effectiveness Deadline, or (iii) after the Effectiveness Deadline, (A) such Registration Statement or a registration statement on Form S-3 registering the Registrable Securities ceases for any reason to remain continuously effective as to all Registrable Securities included in such Registration Statement, or the Holders are otherwise not permitted to utilize the Prospectus therein to resell such Registrable Securities, for more than 30 consecutive calendar days or more than an aggregate of 60 calendar days during any 12-month period and such holders are not able to sell such Registrable Securities under Rule 144 (which need not be consecutive calendar days) (other than during an Allowable Grace Period (as defined below) (and other than as a result of a Holder's failure to return a Selling Stockholder Questionnaire within the time period provided by Section 2(d) hereof), or (iv) a Grace Period (as defined below) exceeds the Allowable Grace Period (any such failure or breach being referred to as an "Event", and for purposes of clause (i) and (ii), the date on which such Event occurs, or for purposes of clause (iii) the date on which such 30 or 60 calendar day period, as applicable, is exceeded, or for purposes of clause (iv) the date on which the Allowable Grace Period is exceeded, being referred to as "Event Date"), then, in addition to any other rights the Holders may have hereunder or under applicable law, on each such Event Date and on each monthly anniversary of each such Event Date (if the applicable Event shall not have been cured by such date) until the applicable Event is cured, the Company shall pay to each Holder an amount in cash, as partial liquidated damages and not as a penalty, equal to 1.5% of the aggregate purchase price paid by such Holder pursuant to the Purchase Agreement for the number of shares of unregistered Registrable Securities then held by such Holder other than 415 Cutback Shares. Notwithstanding the foregoing, (A) the maximum aggregate liquidated damages payable to a Holder under this Agreement, including any interest, shall be 10.0% of the aggregate Subscription Amount paid by such Holder pursuant to the Purchase Agreement, (B) no liquidated damages shall accrue after the Effectiveness Period, (C) no liquidated damages shall accrue during any period during which the Company has advised the Holders of Registrable Securities to suspend the use of any Prospectus pursuant to Section 3(d), (D) no liquidated damages shall accrue as the result of the occurrence of any event or the passage of time described in Section 3(d)(v) that occurs prior to the Effectiveness Date and (E) no liquidated damages shall accrue after the date the shares then held by such Holder are no longer Registrable Securities. If the Company fails to pay any liquidated damages pursuant to this Section in full within seven calendar days after the date payable, the Company will pay interest thereon at a rate of 1.5% per month (or such lesser maximum amount that is permitted to be paid by applicable law) to the Holder, accruing daily from the date such liquidated damages are due until such amounts, plus all such interest thereon, are paid in full. The liquidated damages pursuant to the terms hereof shall apply on a daily pro rata basis for any portion of a month prior to the cure of an Event. Notwithstanding the foregoing, an "Event" shall not include (v) a failure of a Registration Statement to be declared effective as a result of the Commission's refusal to accept the Plan of Distribution contained in such Registration Statement, (w) a Registration Statement not being filed, not being declared effective, or not remaining effective if a Purchaser has failed to timely provide the Company with information requested by the Company and necessary to complete the Registration Statement in accordance with the requirements of the Securities Act (in which the Effectiveness Date would be extended with respect to Registrable Securities held by such Purchaser), (x) a Registration Statement not remaining effective if the Company has advised the Holders of Registrable Securities to suspend the use of any Prospectus pursuant to Section 3(d), (y) a Registration Statement not being filed, not being declared effective, or not remaining effective due to the occurrence of any event or the passage of time described in Section 3(d)(v) that occurs prior to the Effectiveness Date, or (z) events or circumstances that are not in any way attributable to the Company. The Company shall not be liable for liquidated damages under this Agreement as to any Registrable Securities which are not permitted by the Commission to be included in a Registration Statement due to SEC Guidance from the time that it is determined that such Registrable Securities are not permitted to be registered until such time as the provisions of this Agreement as to the Remainder Registration Statements required to be filed hereunder are triggered, in which case the provisions of this Section 2(c) shall once again apply, if applicable. In such case, the liquidated damages shall

be calculated to only apply to the percentage of Registrable Securities which are permitted in accordance with SEC Guidance to be included in such Registration Statement. The Effectiveness Deadline for a Registration Statement shall be extended without default or liquidated damages hereunder in the event that the Company's failure to obtain the effectiveness of the Registration Statement on a timely basis results from the failure of a Holder to timely provide the Company with information requested by the Company and necessary to complete the Registration Statement in accordance with the requirements of the Securities Act (in which the Effectiveness Deadline would be extended with respect to Registrable Securities held by such Holder).

(d) Each Holder agrees to furnish to the Company a completed Selling Shareholder Questionnaire in the form attached to this Agreement as Annex B or in a form mutually agreeable between the Parties. At least ten (10) Trading Days prior to the first anticipated filing date of a Registration Statement for any registration under this Agreement, the Company will notify each Holder of the information the Company requires from that Holder other than the information contained in the Selling Shareholder Questionnaire, if any, which shall be completed and delivered to the Company promptly upon request and, in any event, within three (3) Trading Days prior to the applicable anticipated filing date. Each Holder further agrees that it shall not be entitled to be named as a selling Shareholder in the Registration Statement or use the Prospectus for offers and resales of Registrable Securities at any time, unless such Holder has returned to the Company a completed and signed Selling Shareholder Questionnaire and a response to any requests for further information as described in the previous sentence. If a Holder of Registrable Securities returns a Selling Shareholder Questionnaire or a request for further information, in either case, after its respective deadline, the Company shall use its commercially reasonable efforts at the expense of the Holder who failed to return the Selling Shareholder Questionnaire or to respond for further information to take such actions as are required to name such Holder as a selling security holder in the Registration Statement or any pre-effective or post-effective amendment thereto and to include (to the extent not theretofore included) in the Registration Statement the Registrable Securities identified in such late Selling Shareholder Questionnaire or request for further information. Each Holder acknowledges and agrees that the information in the Selling Shareholder Questionnaire or request for further information as described in this Section 2(d) will be used by the Company in the preparation of the Registration Statement and hereby consents to the inclusion of such information in the Registration Statement.

(e) Notwithstanding anything to the contrary herein, at any time after any Registration Statement has been declared effective by the Commission, the Company may delay the disclosure of material non-public information concerning the Company if the disclosure of such information at the time is not, in the good faith judgment of the Company, in the best interests of the Company (a "Grace Period"); provided, however, the Company shall promptly (i) notify the Holders in writing (including via facsimile or other electronic transmission) of the existence of material non-public information giving rise to a Grace Period (provided that the Company shall not disclose the content of such material non-public information to the Holders) or the need to file a supplement or post-effective amendment, as applicable, and the date on which such Grace Period will begin, and (ii) notify the Holders in writing (including via facsimile or other electronic transmission) of the date on which the Grace Period ends; provided, further, that no single Grace Period shall exceed thirty (30) consecutive days, and during any three hundred sixty-five (365) day period, the aggregate of all Grace Periods shall not exceed an aggregate of sixty (60) days (each Grace Period complying with this provision being an "Allowable Grace Period"). For purposes of determining the length of a Grace Period, the Grace Period shall be deemed to begin on and include the date the Holders receive the notice referred to in clause (i) above and shall end on and include the later of the date the Holders receive the notice referred to in clause (ii) above and the date referred to in such notice; provided, however, that no Grace Period shall be longer than an Allowable Grace Period.

3. Registration Procedures.

In connection with the Company's registration obligations hereunder, the Company shall:

(a) Not less than 5 Trading Days prior to the filing of each Registration Statement and not less than one Trading Day prior to the filing of any related Prospectus or any amendment or supplement thereto (not including any document that would be incorporated or deemed to be incorporated therein by reference, and not including a supplement or amendment filed solely for the purpose of adding the contents of a Form 10-K, Form 10-Q or Form 8-K filed at such as time as the Registration Statement is on a form that does not permit "forward" incorporation by reference), the Company shall (i) furnish to each Holder copies of all such documents proposed to be filed, which documents (other than those incorporated or deemed to be incorporated by reference, and other than a supplement or amendment filed solely for the purpose of adding the contents of a Form 10-K, Form 10-Q or Form 8-K filed at such as time as the Registration Statement is on a form that does not permit "forward" incorporation by reference) will be subject to the review of such Holder (it being acknowledged and agreed that if a Holder does not object to or comment on the aforementioned documents within such five Trading Day or one Trading Day period, as the case may be, then the Holder shall be deemed to have consented to and approved the use of such documents) and (ii) cause its officers and directors, counsel and independent certified public accountants to respond to such inquiries as shall be necessary, in the reasonable opinion of respective counsel to each Holder, to conduct a reasonable investigation within the meaning of the Securities Act. The Company shall not file a Registration Statement or any such Prospectus or any amendments or supplements thereto to which the Holders of a majority of the Registrable Securities shall reasonably object in good faith, provided that the Company is notified of such objection in writing no later than 5 Trading Days after the Holders have been so furnished copies of a Registration Statement or 1 Trading Day after the Holders have been so furnished copies of any related Prospectus or amendments or supplements thereto.

(b) (i) Prepare and file with the Commission such amendments, including post-effective amendments, to a Registration Statement and the Prospectus used in connection therewith as may be necessary to keep a Registration Statement continuously effective as to the applicable Registrable Securities for the Effectiveness Period and prepare and file with the Commission such additional Registration Statements in order to register for resale under the Securities Act all of the Registrable Securities (except during an Allowable Grace Period); (ii) cause the related Prospectus to be amended or supplemented by any required Prospectus supplement (subject to the terms of this Agreement), and, as so supplemented or amended, to be filed pursuant to Rule 424 (except during an Allowable Grace Period); (iii) respond as promptly as reasonably possible to any comments received from the Commission with respect to a Registration Statement or any amendment thereto and provide as promptly as reasonably possible to the Holders true and complete copies of all correspondence from and to the Commission relating to a Registration Statement (provided that the Company may excise any information contained therein which would constitute material non-public information concerning the Company); and (iv) comply in all material respects with the provisions of the Securities Act and the Exchange Act with respect to the disposition of all Registrable Securities covered by a Registration Statement during the applicable period in accordance (subject to the terms of this Agreement) with the intended methods of disposition by the Holders thereof set forth in such Registration Statement as so amended or in such Prospectus as so supplemented; provided, however, that each Purchaser shall be responsible for the delivery of the Prospectus to the Persons to whom such Purchaser sells any of the Shares (including in accordance with Rule 172 under the Securities Act), and each Purchaser agrees to dispose of Registrable Securities in compliance with the plan

of distribution described in the Registration Statement and otherwise in compliance with applicable federal and state securities laws.

(c) If during the Effectiveness Period, the number of Registrable Securities at any time exceeds 100% of the number of shares of Common Stock then registered in a Registration Statement, then the Company shall file as soon as reasonably practicable, but in any case prior to the applicable Filing Deadline, a Remainder Registration Statement covering the resale by the Holders of not less than the number of such Registrable Securities, subject to any limitations pursuant to SEC Guidance.

(d) Notify the Holders of Registrable Securities to be sold (which notice shall, pursuant to clauses (iii) through (vi) hereof, be accompanied by an instruction to suspend the use of the Prospectus until the requisite changes have been made) as promptly as reasonably possible (and, in the case of (i)(A) below, not less than one Trading Day prior to such filing) and (if requested by any such Person) confirm such notice in writing (including via facsimile or other electronic transmission) no later than one Trading Day following the day (i)(A) when a Prospectus or any Prospectus supplement or post-effective amendment to a Registration Statement is proposed to be filed; and (B) when the Commission notifies the Company whether there will be a “review” of such Registration Statement and whenever the Commission comments in writing on such Registration Statement; (ii) of any request by the Commission or any other federal or state governmental authority for amendments or supplements to a Registration Statement or Prospectus or for additional information; (iii) of the issuance by the Commission or any other federal or state governmental authority of any stop order suspending the effectiveness of a Registration Statement covering any or all of the Registrable Securities or the initiation of any Proceedings for that purpose; (iv) of the receipt by the Company of any notification with respect to the suspension of the qualification or exemption from qualification of any of the Registrable Securities for sale in any jurisdiction, or the initiation or threatening of any Proceeding for such purpose; and (v) of the occurrence of any event or passage of time that makes the financial statements included in a Registration Statement ineligible for inclusion therein or any statement made in a Registration Statement or Prospectus or any document incorporated or deemed to be incorporated therein by reference untrue in any material respect or that requires any revisions to a Registration Statement, Prospectus or other documents so that, in the case of a Registration Statement or the Prospectus, as the case may be, it will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and (vi) of the occurrence or existence of any pending corporate development with respect to the Company that the Company believes may be material and that, in the determination of the Company, makes it not in the best interest of the Company to allow continued availability of a Registration Statement or Prospectus, provided that any and all of such information shall be kept confidential by each Holder until such information otherwise becomes public, unless disclosure by a Holder is required by law; provided, further, that notwithstanding each Holder’s agreement to keep such information confidential, each such Holder makes no acknowledgement that any such information is material, non-public information.

(e) Use its commercially reasonable efforts to avoid the issuance of, or, if issued, obtain the withdrawal of (i) any order stopping or suspending the effectiveness of a Registration Statement, or (ii) any suspension of the qualification (or exemption from qualification) of any of the Registrable Securities for sale in any jurisdiction, at the earliest practicable moment.

(f) The Company may require each selling Holder to furnish to the Company a certified statement as to (i) the number of shares of Common Stock beneficially owned by such Holder and any Affiliate thereof, (ii) any Financial Industry Regulatory Authority, Inc. ("FINRA") affiliations, (iii) any natural persons who have the power to vote or dispose of the common stock and (iv) any other information as may be requested by the Commission, FINRA or any state securities commission. During any periods that the Company is unable to meet its obligations hereunder with respect to the registration of Registrable Securities because any Holder fails to furnish such information within five Trading Days of the Company's request, any liquidated damages that are accruing at such time as to such Holder only shall be tolled and any Event that may otherwise occur solely because of such delay shall be suspended as to such Holder only, until such information is delivered to the Company; provided, however, if the failure of the Holder to furnish the required information results the occurrence of an Event under 2(c), any liquidated damages that are accruing at such time shall be tolled and any such Event that occurs as a result thereof shall be suspended until such time as the Holder furnishes such information.

(g) Subject to the terms of this Agreement, the Company hereby consents to the use of such Prospectus and each amendment or supplement thereto by each of the selling Holders in connection with the offering and sale of the Registrable Securities covered by such Prospectus and any amendment or supplement thereto, except after the giving of any notice pursuant to Section 3(d).

(h) The Company shall cooperate with any registered broker through which a Holder proposes to resell its Registrable Securities in effecting a filing with FINRA pursuant to FINRA Rule 5110 as requested by any such Holder and the Company shall pay the filing fee required for the first such filing within two (2) Business Days of the request therefor.

(i) Prior to any resale of Registrable Securities by a Holder, use its commercially reasonable efforts to register or qualify or cooperate with the selling Holders in connection with the registration or qualification (or exemption from the Registration or qualification) of such Registrable Securities for the resale by the Holder under the securities or Blue Sky laws of such jurisdictions within the United States as any Holder reasonably requests in writing, to keep each registration or qualification (or exemption therefrom) effective during the Effectiveness Period and to do any and all other acts or things reasonably necessary to enable the disposition in such jurisdictions of the Registrable Securities covered by each Registration Statement; provided, that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified, would subject the Company to any material tax in any such jurisdiction where it is not then so subject or file a general consent to service of process in any such jurisdiction.

(j) If requested by a Holder, cooperate with such Holder to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be delivered to a transferee pursuant to a Registration Statement, which certificates shall be free, to the extent permitted by the Purchase Agreement and applicable state and Federal laws, of all restrictive legends, and to enable such Registrable Securities to be in such denominations and registered in such names as any such Holder may request.

(k) Upon the occurrence of any event contemplated by Section 3(d), as promptly as reasonably possible under the circumstances taking into account the Company's good faith assessment of any adverse consequences to the Company and its Shareholders of the premature disclosure of such event, prepare a supplement or amendment, including a post-effective amendment, to a Registration Statement or a supplement to the related Prospectus or any document incorporated or deemed to be incorporated therein by reference, and file any other required document so that, as thereafter delivered, neither a Registration Statement nor such Prospectus will contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading. If the Company notifies the Holders in accordance with clauses (iii) through (vi) of Section 3(d) above to suspend the use of any Prospectus until the requisite changes to such Prospectus have been made, then the Holders shall suspend use of such Prospectus. The Company will use its commercially reasonable efforts to ensure that the use of the Prospectus may be resumed as promptly as is practicable. The Company shall be entitled to exercise its right under this Section 3(k) to suspend the availability of a Registration Statement and Prospectus, for a period not to exceed 60 calendar days (which need not be consecutive days) in any 12 month period.

(l) Comply in all material respects with all applicable rules and regulations of the Commission.

4. Registration Expenses. All fees and expenses incident to the performance of or compliance with this Agreement by the Company shall be borne by the Company whether or not any Registrable Securities are sold pursuant to a Registration Statement. The fees and expenses referred to in the foregoing sentence shall include, without limitation, (i) all registration and filing fees (including, without limitation, fees and expenses of the Company's counsel and auditors) (A) with respect to filings made with the Commission, (B) with respect to filings required to be made with any Trading Market on which the Common Stock is then listed for trading, (C) in compliance with applicable state securities or Blue Sky laws reasonably agreed to by the Company in writing (including, without limitation, fees and disbursements of counsel for the Company in connection with Blue Sky qualifications or exemptions of the Registrable Securities) and (D) if not previously paid by the Company in connection with an Issuer filing, with respect to any filing that may be required to be made by any broker through which a Holder intends to make sales of Registrable Securities with the FINRA pursuant to FINRA Rule 5110, so long as the broker is receiving no more than a customary brokerage commission in connection with such sale, (ii) printing expenses (including, without limitation, expenses of printing certificates for Registrable Securities), (iii) messenger, telephone and delivery expenses, (iv) fees and disbursements of counsel for the Company, (v) Securities Act liability insurance, if the Company so desires such insurance, and (vi) fees and expenses of all other Persons retained by the Company in connection with the consummation of the transactions contemplated by this Agreement. In addition, the Company shall be responsible for all of its internal expenses incurred in connection with the consummation of the transactions contemplated by this Agreement (including, without limitation, all salaries and expenses of its officers and employees performing legal or accounting duties), the expense of any annual audit and the fees and expenses incurred in

connection with the listing of the Registrable Securities on any securities exchange as required hereunder. In no event shall the Company be responsible for any underwriting, broker or similar commissions of any Holder or, except to the extent provided for in the Transaction Documents, any legal fees or other costs of the Holders.

5. Indemnification.

(a) Indemnification by the Company. The Company shall, notwithstanding any termination of this Agreement, indemnify and hold harmless each Holder, the officers, directors, members, partners, agents and employees (and any other Persons with a functionally equivalent role of a Person holding such titles, notwithstanding a lack of such title or any other title) of each of them, each Person who controls any such Holder (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) and the officers, directors, members, shareholders, partners, agents and employees (and any other Persons with a functionally equivalent role of a Person holding such titles, notwithstanding a lack of such title or any other title) of each such controlling Person, to the fullest extent permitted by applicable law, from and against any and all losses, claims, damages, liabilities, costs (including, without limitation, reasonable attorneys' fees) and expenses (collectively, "Losses"), as incurred, arising out of or relating to (1) any untrue or alleged untrue statement of a material fact contained in a Registration Statement, any Prospectus or any form of prospectus or in any amendment or supplement thereto or in any preliminary prospectus, or arising out of or relating to any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein (in the case of any Prospectus or supplement thereto, in light of the circumstances under which they were made) not misleading or (2) any violation or alleged violation by the Company of the Securities Act, the Exchange Act or any state securities law, or any rule or regulation thereunder, in connection with the performance of its obligations under this Agreement, except to the extent, but only to the extent, that (i) such untrue statements or omissions are in reliance upon, and in conformity with, information regarding such Holder furnished in writing to the Company by such Holder expressly for use therein, or to the extent that such information relates to such Holder or such Holder's proposed method of distribution of Registrable Securities and was reviewed and expressly approved in writing by such Holder expressly for use in a Registration Statement, such Prospectus or in any amendment or supplement thereto (it being understood that the Holder has approved Annex A hereto for this purpose) or (ii) in the case of an occurrence of an event of the type specified in Section 3(d)(ii)-(vi), the use by such Holder of an outdated or defective Prospectus after the Company has notified such Holder in writing that the Prospectus is outdated or defective and prior to the receipt by such Holder of the Advice contemplated in Section 6(d). The Company shall notify the Holders promptly of the institution, threat or assertion of any Proceeding arising from or in connection with the transactions contemplated by this Agreement of which the Company is aware.

(b) Indemnification by Holders. Each Holder shall, severally and not jointly, indemnify and hold harmless the Company, its directors, officers, agents and employees, each Person who controls the Company (within the meaning of Section 15 of the Securities Act and Section 20 of the Exchange Act), and the directors, officers, agents or employees of such controlling Persons, to the fullest extent permitted by applicable law, from and against all Losses, as incurred, to the extent arising out of or based solely upon: (x) such Holder's failure to comply with the prospectus delivery requirements of the Securities Act or (y) any untrue or alleged untrue statement of a material fact contained in any Registration Statement, any Prospectus, or in any amendment or supplement thereto or in any preliminary prospectus, or arising out of or relating to any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein not misleading (i) to the extent, but only to the extent, that such untrue statement or omission is contained in any information so furnished in writing by such Holder to the Company specifically for inclusion in such Registration Statement or such Prospectus or (ii) to the extent that such information relates to such Holder's proposed method of distribution of Registrable Securities and was reviewed and expressly approved in writing by such Holder expressly for use in a Registration Statement (it being understood that the Holder has approved Annex A hereto for this purpose), such Prospectus or in any amendment or supplement thereto or (iii) in the case of an occurrence of an event of the type specified in Section 3(d)(ii)-(vi), the use by such Holder of an outdated or defective Prospectus after the Company has notified such Holder in writing that the Prospectus is outdated or defective and prior to the receipt by such Holder of the Advice contemplated in Section 6(d). In no event shall the liability of any selling Holder hereunder be greater in amount than the dollar amount of the net proceeds received by such Holder upon the sale of the Registrable Securities giving rise to such indemnification obligation.

(c) Conduct of Indemnification Proceedings. If any Proceeding shall be brought or asserted against any Person entitled to indemnity hereunder (an "Indemnified Party"), such Indemnified Party shall promptly notify the Person from whom indemnity is sought (the "Indemnifying Party") in writing, and the Indemnifying Party shall have the right to assume the defense thereof, including the employment of counsel reasonably satisfactory to the Indemnified Party and the payment of all fees and expenses incurred in connection with defense thereof; provided, that the failure of any Indemnified Party to give such notice shall not relieve the Indemnifying Party of its obligations or liabilities pursuant to this Agreement, except (and only) to the extent that it shall be finally determined by a court of competent jurisdiction (which determination is not subject to appeal or further review) that such failure shall have prejudiced the Indemnifying Party.

An Indemnified Party shall have the right to employ separate counsel in any such Proceeding and to participate in the defense thereof, but the fees and expenses of such counsel shall be at the expense of such Indemnified Party or Parties unless: (1) the Indemnifying Party has agreed in writing to pay such fees and expenses; (2) the Indemnifying Party shall have failed promptly to assume the defense of such Proceeding and to employ counsel reasonably satisfactory to such Indemnified Party in any such Proceeding; or (3) the named parties to any such Proceeding (including any impleaded parties) include both such Indemnified Party and the Indemnifying Party, and counsel to the Indemnified Party shall reasonably believe that a material conflict of interest is likely to exist if the same counsel were to represent such Indemnified Party and the Indemnifying Party (in which case, if such Indemnified Party notifies the Indemnifying Party in writing that it elects to employ separate counsel at the expense of the Indemnifying Party, the Indemnifying Party shall not have the right to assume the defense thereof and the reasonable fees and expenses of no more than one separate counsel shall be at the expense of the Indemnifying Party). The Indemnifying Party shall not be liable for any settlement of any such Proceeding effected without its written consent, which consent shall not be unreasonably withheld or delayed. No Indemnifying Party shall, without the prior written consent of the Indemnified Party, effect any settlement of any pending Proceeding in respect of which any Indemnified Party is a party, unless such settlement includes an unconditional release of such Indemnified Party from all liability on claims that are the subject matter of such Proceeding.

Subject to the terms of this Agreement, all reasonable fees and expenses of the Indemnified Party (including reasonable fees and expenses to the extent incurred in connection with investigating or preparing to defend such Proceeding in a manner not inconsistent with this Section) shall be paid to the Indemnified Party, as incurred, within twenty Trading Days of written notice thereof to the Indemnifying Party; provided, that the Indemnified Party shall promptly reimburse the Indemnifying Party for that portion of such fees and expenses previously disbursed and that are applicable to such actions for which such Indemnified Party is judicially determined to be not entitled to indemnification hereunder.

(d) Contribution. If the indemnification under Section 5(a) or 5(b) is unavailable to an Indemnified Party or insufficient to hold an Indemnified Party harmless for any Losses, then each Indemnifying Party shall contribute to the amount paid or payable by such Indemnified Party, in such proportion as is appropriate to reflect the relative fault of the Indemnifying Party and Indemnified Party in connection with the actions, statements or omissions that resulted in such Losses as well as any other relevant equitable considerations. The relative fault of such Indemnifying Party and Indemnified Party shall be determined by reference to, among other things, whether any action in question, including any untrue or alleged untrue statement of a material fact or omission or alleged omission of a material fact, has been taken or made by, or relates to information supplied by, such Indemnifying Party or Indemnified Party, and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such action, statement or omission. The amount paid or payable by a party as a result of any Losses shall be deemed to include, subject to the limitations set forth in this Agreement, any reasonable attorneys' or other reasonable fees or expenses incurred by such party in connection with any Proceeding to the extent such party would have been indemnified for such fees or expenses if the indemnification provided for in this Section was available to such party in accordance with its terms.

The parties hereto agree that it would not be just and equitable if contribution pursuant to this Section 5(d) were determined by pro rata allocation or by any other method of allocation that does not take into account the equitable considerations referred to in the immediately preceding paragraph. Notwithstanding the provisions of this

Section 5(d), no Holder shall be required to contribute, in the aggregate, any amount in excess of the amount by which the net proceeds actually received by such Holder from the sale of the Registrable Securities subject to the Proceeding exceeds the amount of any damages that such Holder has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission.

The indemnity and contribution agreements contained in this Section are in addition to any liability that the Indemnifying Parties may have to the Indemnified Parties.

6. Miscellaneous.

(a) Remedies. Subject to the limitations set forth in this Agreement, in the event of a breach by the Company or by a Holder of any of their respective obligations under this Agreement, each Holder or the Company, as the case may be, in addition to being entitled to exercise all rights granted by law and under this Agreement, including recovery of damages, shall be entitled to specific performance of its rights under this Agreement. The Company and each Holder agree that monetary damages would not provide adequate compensation for any losses incurred by reason of a breach by it of any of the provisions of this Agreement and hereby further agrees that, in the event of any action for specific performance in respect of such breach, it shall not assert or shall waive the defense that a remedy at law would be adequate.

(b) Piggyback on Registrations. Except as set forth in this Agreement, the Purchase Agreement or the SEC Documents, neither the Company nor any of its security holders (other than the Holders in such capacity pursuant hereto) may include securities of the Company in a Registration Statement filed pursuant to this Agreement, other than the Registrable Securities.

(c) Compliance. Each Holder covenants and agrees that it will comply with the prospectus delivery requirements of the Securities Act as applicable to it in connection with sales of Registrable Securities pursuant to a Registration Statement.

(d) Discontinued Disposition. By its acquisition of Registrable Securities, each Holder agrees that, upon receipt of a notice from the Company of the occurrence of any event of the kind described in Section 3(d)(ii) through (vi), such Holder will forthwith discontinue disposition of such Registrable Securities under a Registration Statement until it is advised in writing (the "Advice") by the Company that the use of the applicable Prospectus (as it may have been supplemented or amended) may be resumed. The Company will use its commercially reasonable efforts to ensure that the use of the Prospectus may be resumed as promptly as is practicable.

(e) Amendments and Waivers. The provisions of this Agreement, including the provisions of this sentence, may not be amended, modified or supplemented, and waivers or consents to departures from the provisions hereof may not be given, unless the same shall be in writing and signed by the Company and the Holders of a majority of the then outstanding Registrable Securities. If a Registration Statement does not register all of the Registrable Securities pursuant to a waiver or amendment done in compliance with the previous sentence, then the number of Registrable Securities to be registered for each Holder shall be reduced pro rata among all Holders and each Holder shall have the right to designate which of its Registrable Securities shall be omitted from such Registration Statement. Notwithstanding the foregoing, a waiver or consent to depart from the provisions hereof with respect to a matter that relates exclusively to the rights of some Holders and that does not directly or indirectly affect the rights of other Holders may be given by Holders of all of the Registrable Securities to which such waiver or consent relates; provided, however, that in the event the Company shall deliver written notice to a Holder with respect to a requested waiver or amendment, such Holder shall be deemed to have consented and agreed to such amendment or waiver if such Holder does not provide written notice to the Company indicating such Holder's non-consent within ten (10) calendar days of delivery by the Company of such written notice; provided, further, that the provisions of this sentence may not be amended, modified, or supplemented except in accordance with the provisions of the first sentence of this Section 6(e).

(f) Notices. Any and all notices or other communications or deliveries required or permitted to be provided hereunder shall be delivered as set forth in the Purchase Agreement.

(g) Successors and Assigns. This Agreement shall inure to the benefit of and be binding upon the successors and permitted assigns of each of the parties and shall inure to the benefit of each Holder. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and assigns any rights, remedies, obligations, or liabilities under or by reason of this Agreement, except as expressly provided in this Agreement. The Company may not assign its rights (except by merger or in connection with another entity acquiring all or substantially all of the Company's assets) or obligations hereunder without the prior written consent of all the Holders of the then outstanding Registrable Securities. Each Holder may assign its respective rights with respect to any or all of its Shares, hereunder in the manner and to the Persons as permitted under the Purchase Agreement; *provided* in each case that (i) the Holder agrees in writing with the transferee or assignee to assign such rights and related obligations under this Agreement, and for the transferee or assignee to assume such obligations, and a copy of such agreement is furnished to the Company within a reasonable time after such assignment, (ii) the Company is, within a reasonable time after such transfer or assignment, furnished with written notice of the name and address of such transferee or assignee and the securities with respect to which such registration rights are being transferred or assigned, (iii) at or before the time the Company received the written notice contemplated by clause (ii) of this sentence, the transferee or assignee agrees in writing with the Company to be bound by all of the provisions contained herein and (iv) the transferee is an "accredited investor," as that term is defined in Rule 501 of Regulation D and completes any required documentation requested by the Company to confirm the foregoing.

(h) No Inconsistent Agreements. Except as set forth in the Purchase Agreement or in the SEC Documents, neither the Company nor any of its subsidiaries has previously entered into any agreement granting any registration rights with respect to any of its securities to any Person that have not been satisfied in full.

(i) Execution and Counterparts. This Agreement may be executed in two or more counterparts, all of which when taken together shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other party, it being understood that both parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission or other electronic transmission of a “.pdf” format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or “.pdf” signature page were an original thereof.

(j) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Agreement shall be determined in accordance with the provisions of the Purchase Agreement.

(k) Cumulative Remedies. The remedies provided herein are cumulative and not exclusive of any other remedies provided by law.

(l) Severability. If any term, provision, covenant or restriction of this Agreement is held by a court of competent jurisdiction to be invalid, illegal, void or unenforceable, the remainder of the terms, provisions, covenants and restrictions set forth herein shall remain in full force and effect and shall in no way be affected, impaired or invalidated, and the parties hereto shall use their commercially reasonable efforts to find and employ an alternative means to achieve the same or substantially the same result as that contemplated by such term, provision, covenant or restriction. It is hereby stipulated and declared to be the intention of the parties that they would have executed the remaining terms, provisions, covenants and restrictions without including any of such that may be hereafter declared invalid, illegal, void or unenforceable.

(m) Headings. The headings in this Agreement are for convenience only, do not constitute a part of the Agreement and shall not be deemed to limit or affect any of the provisions hereof.

(n) Independent Nature of Holders' Obligations and Rights. The obligations of each Holder hereunder are several and not joint with the obligations of any other Holder hereunder, and no Holder shall be responsible in any way for the performance of the obligations of any other Holder hereunder. Nothing contained herein or in any other agreement or document delivered at any closing, and no action taken by any Holder pursuant hereto or thereto, shall be deemed to constitute the Holders as a partnership, an association, a joint venture or any other kind of entity, or create a presumption that the Holders are in any way acting in concert with respect to such obligations or the transactions contemplated by this Agreement. Each Purchaser acknowledges that no other Purchaser has acted as agent for such Purchaser in connection with making its investment hereunder and that no Purchaser will be acting as agent of such Purchaser in connection with monitoring its investment in the Shares or enforcing its rights under the Purchase Agreement or any other agreement entered into in connection with the Purchase Agreement. Each Holder shall be entitled to protect and enforce its rights, including without limitation the rights arising out of this Agreement, and it shall not be necessary for any other Holder to be joined as an additional party in any proceeding for such purpose.

[Signature pages follow]

IN WITNESS WHEREOF, the parties have executed this Registration Rights Agreement as of the date first written above.

SYNTHETIC
BIOLOGICS,
INC.

By:

Name:

Title:

[SIGNATURE PAGE OF PURCHASERS FOLLOWS]

PURCHASER SIGNATURE PAGE TO REGISTRATION RIGHTS AGREEMENT

Name of Purchaser:

Signature of Authorized Signatory of Purchaser:

Name of Authorized Signatory:

Title of Authorized Signatory:

Address for Notice of Purchaser:

Annex A

Plan of Distribution

We are registering the shares of Common Stock previously issued to the Selling Shareholders previously issued to the Selling Shareholders to permit the resale of these shares of Common Stock by the holders of the Common Stock from time to time after the date of this prospectus. We will not receive any of the proceeds from the sale by the Selling Shareholders of the shares of Common Stock. We will bear all fees and expenses incident to our obligation to register the shares of Common Stock.

The Selling Shareholders, or their pledges, donees, transferees, or any of their successors in interest selling shares received from a Selling Shareholder as a gift, partnership distribution or other non-sale related transfer after the date of this prospectus, may sell all or a portion of the shares of Common Stock beneficially owned by them and offered hereby from time to time directly or through one or more underwriters, broker-dealers or agents. If the shares of Common Stock are sold through underwriters or broker-dealers, the Selling Shareholders will be responsible for underwriting discounts or commissions or agent's commissions. The shares of Common Stock may be sold in one or more transactions at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or at negotiated prices. The Selling Shareholders will act independently of us in making decisions with respect to the timing, manner and size of each sale. These sales may be affected in transactions, which may involve crosses or block transactions,

• on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;

• in the over-the-counter market;

- in transactions otherwise than on these exchanges or systems or in the over-the-counter market;
- through the writing of options, whether such options are listed on an options exchange or otherwise;
- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;

• block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;

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- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;

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- privately negotiated transactions;
- short sales;

through the distribution of the Common Stock by any Selling Shareholders to its partners, members or Shareholders;

- through one or more underwritten offerings on a firm commitment or best efforts basis;
- sales pursuant to Rule 144;

broker-dealers may agree with the Selling Shareholders to sell a specified number of such shares at a stipulated price per share;

- a combination of any such methods of sale; and
- any other method permitted pursuant to applicable law.

The Selling Shareholders may also transfer the Common Shares by gift.

The Selling Shareholders may engage brokers and dealers, and any brokers or dealers may arrange for other brokers or dealers to participate in effecting sales of the Common Shares. These brokers, dealers or underwriters may act as principals, or as an agent of a Selling Shareholder. Broker-dealers may agree with a Selling Shareholder to sell a specified number of the Common Shares at a stipulated price per security. If the broker-dealer is unable to sell the Common Shares acting as agent for a Selling Shareholder, it may purchase as principal any unsold Common Shares at the stipulated price. Broker-dealers who acquire Common Shares as principals may thereafter resell the Common Shares from time to time in transactions in any stock exchange or automated interdealer quotation system on which the Common Shares are then listed, at prices and on terms then prevailing at the time of sale, at prices related to the then-current market price or in negotiated transactions. Broker-dealers may use block transactions and sales to and through broker-dealers, including transactions of the nature described above.

The Selling Shareholders may also sell the Common Shares in accordance with Rule 144 under the Securities Act of 1933, as amended, rather than pursuant to this prospectus, regardless of whether the Common Shares are covered by this prospectus

If the Selling Shareholders effect such transactions by selling shares of Common Stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents may receive commissions in the form of discounts, concessions or commissions from the Selling Shareholders or commissions from purchasers of the shares of Common Stock for whom they may act as agent or to whom they may sell as principal (which discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary in the types of transactions involved). In connection with sales of the shares of Common Stock or otherwise, the Selling Shareholders may enter into hedging transactions with broker-dealers, which may in turn engage in short sales of the shares of Common Stock in the course of hedging in positions they assume. The Selling Shareholders may also sell shares of Common Stock short and deliver shares of Common Stock covered by this prospectus to close out short positions and to return borrowed shares in connection with such short sales. The Selling Shareholders may also loan or pledge shares of Common Stock to broker-dealers that in turn may sell such shares.

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The Selling Shareholders may pledge or grant a security interest in some or all of the shares of Common Stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of Common Stock from time to time pursuant to this prospectus or any amendment to this prospectus under Rule 424(b)(3) or other applicable provision of the Securities Act amending, if necessary, the list of Selling Shareholders to include the pledgee, transferee or other successors in interest as Selling Shareholders under this prospectus. The Selling Shareholders also may transfer and donate the shares of Common Stock in other circumstances in which case the transferees, donees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In addition, a Selling Shareholder may, from time to time, sell the Common Shares short, and, in those instances, this prospectus may be delivered in connection with the short sales and the Common Shares offered under this prospectus may be used to cover short sales.

The Selling Shareholders and any broker-dealer participating in the distribution of the shares of Common Stock may be deemed to be “underwriters” within the meaning of the Securities Act, and any commission paid, or any discounts or concessions allowed to, any such broker-dealer may be deemed to be underwriting commissions or discounts under the Securities Act. At the time a particular offering of the shares of Common Stock is made, a prospectus supplement, if required, will be distributed which will set forth the aggregate amount of shares of Common Stock being offered and the terms of the offering, including the name or names of any broker-dealers or agents, any discounts, commissions and other terms constituting compensation from the Selling Shareholders and any discounts, commissions or concessions allowed or reallocated or paid to broker-dealers. The Selling Shareholders may indemnify any broker-dealer that participates in transactions involving the sale of the shares of Common Stock against certain liabilities, including liabilities arising under the Securities Act.

Under the securities laws of some states, the shares of Common Stock may be sold in such states only through registered or licensed brokers or dealers. In addition, in some states the shares of Common Stock may not be sold unless such shares have been registered or qualified for sale in such state or an exemption from registration or qualification is available and is complied with.

There can be no assurance that any Selling Shareholder will sell any or all of the shares of Common Stock registered pursuant to the registration statement, of which this prospectus forms a part.

The Selling Shareholders and any other person participating in such distribution will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including, without limitation, Regulation M of the Exchange Act, which may limit the timing of purchases and sales of any of the shares of Common Stock by the Selling Shareholders and any other participating person. Regulation M may also restrict the ability of any person engaged in the distribution of the shares of Common Stock to engage in market-making activities with respect to the shares of Common Stock. All of the foregoing may affect the marketability of the shares of Common Stock and the ability of any person or entity to engage in market-making activities with respect to the shares of Common Stock.

We will pay all expenses of the registration of the shares of Common Stock pursuant to the Registration Rights Agreement, estimated to be \$[_____] in total, including, without limitation, SEC filing fees and expenses of compliance with state securities or “Blue Sky” laws; *provided, however*, that a Selling Shareholder will pay all underwriting discounts and selling commissions, if any. We will indemnify the Selling Shareholders against liabilities, including some liabilities under the Securities Act, in accordance with the Registration Rights Agreement, or the Selling Shareholders will be entitled to contribution. We may be indemnified by the Selling Shareholders against civil liabilities, including liabilities under the Securities Act, that may arise from any written information furnished to us by the selling Shareholder specifically for use in this prospectus, in accordance with Registration Rights Agreement, or we may be entitled to contribution.

Once sold under the registration statement, of which this prospectus forms a part, the shares of Common Stock will be freely tradable in the hands of persons other than our affiliates.

Annex B

synthetic biologics, inc.

Selling Shareholder Notice and Questionnaire

The undersigned beneficial owner of common stock (the "Registrable Securities") of Synthetic Biologics, Inc., a Nevada corporation (the "Company"), understands that the Company has filed or intends to file with the Securities and Exchange Commission (the "Commission") a registration statement (the "Registration Statement") for the registration and resale under Rule 415 of the Securities Act of 1933, as amended (the "Securities Act"), of the Registrable Securities, in accordance with the terms of the Registration Rights Agreement (the "Registration Rights Agreement") to which this document is annexed. A copy of the Registration Rights Agreement is available from the Company upon request at the address set forth below. All capitalized terms not otherwise defined herein shall have the meanings ascribed thereto in the Registration Rights Agreement.

Certain legal consequences arise from being named as a selling Shareholder in the Registration Statement and the related prospectus. Accordingly, holders and beneficial owners of Registrable Securities are advised to consult their own securities law counsel regarding the consequences of being named or not being named as a selling Shareholder in the Registration Statement and the related prospectus.

NOTICE

The undersigned beneficial owner (the "Selling Shareholder") of Registrable Securities hereby elects to include the Registrable Securities owned by it in the Registration Statement.

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The undersigned hereby provides the following information to the Company and represents and warrants that such information is accurate:

QUESTIONNAIRE

1. Name.

(a) Full Legal Name of Selling Shareholder

(b) Full Legal Name of Registered Holder (if not the same as (a) above) through which Registrable Securities are held:

(c) Full Legal Name of Natural Control Person (which means a natural person who directly or indirectly alone or with others has power to vote or dispose of the securities covered by the questionnaire):

2. Broker-Dealer Status:

(a) Are you a broker-dealer?

Yes " No "

(b) If "yes" to Section 3(a), did you receive your Registrable Securities as compensation for investment banking services to the Company?

Yes " No "

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Note: If no, the Commission's staff has indicated that you should be identified as an underwriter in the Registration Statement.

(c) Are you an affiliate of a broker-dealer?

Yes " No "

If you are an affiliate of a broker-dealer, do you certify that you bought the Registrable Securities in the ordinary (d) course of business, and at the time of the purchase of the Registrable Securities to be resold, you had no agreements or understandings, directly or indirectly, with any person to distribute the Registrable Securities?

Yes " No "

Note: If no, the Commission's staff has indicated that you should be identified as an underwriter in the Registration Statement.

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4. Beneficial Ownership of Securities of the Company Owned by the Selling Shareholder.

Except as set forth below in this Item 4, the undersigned is not the beneficial or registered owner of any securities of the Company other than the securities issuable pursuant to the Purchase Agreement.

(a) Type and Amount of other securities beneficially owned by the Selling Shareholder:

5. Relationships with the Company:

Except as set forth below, neither the undersigned nor any of its affiliates, officers, directors or principal equity holders (owners of 5% or more of the equity securities of the undersigned) has held any position or office or has had any other material relationship with the Company (or its predecessors or affiliates) during the past three years.

State any exceptions here:

The undersigned agrees to promptly notify the Company of any inaccuracies or changes in the information provided herein that may occur subsequent to the date hereof at any time while the Registration Statement remains effective.

By signing below, the undersigned consents to the disclosure of the information contained herein in its answers to Items 1 through 5 and the inclusion of such information in the Registration Statement and the related prospectus and any amendments or supplements thereto. The undersigned understands that such information will be relied upon by the Company in connection with the preparation or amendment of the Registration Statement and the related prospectus.

IN WITNESS WHEREOF the undersigned, by authority duly given, has caused this Notice and Questionnaire to be executed and delivered either in person or by its duly authorized agent.

Dated: Beneficial Owner:

By:

Name:

Title:

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JOINDER AGREEMENT

THIS JOINDER AGREEMENT, executed as of this 25th day of October, 2012, is made and entered into by the undersigned with reference to the following facts:

Reference is made to the Registration Rights Agreement, dated as of December 5, 2011, as amended by the First Amendment to the Registration Rights Agreement, dated as of August 6, 2012 (the "Registration Rights Agreement"), by and between Synthetic Biologics, Inc., a Nevada corporation (the "Company"), and Intrexon Corporation, a Virginia corporation, and any other parties identified on the signature pages of any joinder agreements substantially similar to this Joinder Agreement. Capitalized terms used but not defined in this Joinder Agreement shall have the meanings ascribed thereto in the Registration Rights Agreement.

The undersigned hereby acknowledges that matters pertaining to the registration of the Registrable Securities is governed by the Registration Rights Agreement, and the undersigned hereby (1) acknowledges receipt of a copy of the Registration Rights Agreement, and (2) agrees to be bound as a Holder by the terms of the Registration Rights Agreement, as the same has been or may be amended from time to time.

This Joinder Agreement shall bind, and inure to the benefit of, the parties hereto and their respective devisees, heirs, personal and legal representatives, executors, administrators, successors and assigns. This Joinder Agreement shall be construed and enforced in accordance with the laws of the State of New York without regard or giving effect to its principles of conflicts of law.

[Signatures Follow on Next Page]

IN WITNESS WHEREOF, the undersigned has executed this Joinder Agreement as of the date first set forth above.

NRM VII
HOLDINGS I, LLC

By: /s/ Randal J. Kirk
Name: Randal J.
Kirk
Title: Manager,
Third Security,
LLC,

which is the
Manager of Third
Security Staff
2001 LLC,

which is the
Manager of NRM
VII Holdings I,
LLC

Acknowledged and Agreed by:

SYNTHETIC BIOLOGICS, INC.

By: /s/ C. Evan Ballantyne
Name: C. Evan Ballantyne
Title: Chief Financial Officer

INTREXON
CORPORATION

By: /s/ Donald P. Lehr
Name: Donald P. Lehr
Title: Chief Legal Officer

Synthetic Biologics, Inc.
617 Detroit Avenue, Suite 100
Ann Arbor, MI 48104

SYNTHETIC BIOLOGICS, INC.

WARRANT TO PURCHASE COMMON STOCK

Warrant No.:

Number of Shares of Common Stock: 635,855

Date of Issuance: October 30, 2012

THIS WARRANT AND THE SECURITIES ISSUABLE UPON EXERCISE OF THIS WARRANT HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR ANY STATE SECURITIES LAW, AND MAY NOT BE OFFERED FOR SALE, SOLD OR TRANSFERRED UNLESS A REGISTRATION STATEMENT UNDER SUCH ACT AND APPLICABLE STATE SECURITIES LAWS SHALL BE EFFECTIVE WITH RESPECT THERETO, OR AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT AND APPLICABLE STATE SECURITIES LAWS IS AVAILABLE IN CONNECTION WITH SUCH OFFER, SALE OR TRANSFER AND THE HOLDER DELIVERS TO THE ISSUER AN OPINION OF COUNSEL IN A FORM REASONABLY SATISFACTORY TO THE ISSUER THAT REGISTRATION IS NOT REQUIRED UNDER THE SECURITIES ACT OR SUCH OFFER, SALE OR TRANSFER IS MADE PURSUANT TO RULE 144 UNDER THE SECURITIES ACT. SUBJECT TO COMPLIANCE WITH THE REQUIREMENTS OF THE SECURITIES ACT AND APPLICABLE STATE SECURITIES LAWS, THIS WARRANT AND THE SECURITIES ISSUABLE UPON EXERCISE OF THIS WARRANT MAY NOT BE PLEDGED OR HYPOTHECATED IN CONNECTION WITH A BONA FIDE MARGIN LOAN OR EXTENSION OF CREDIT SECURED BY THIS WARRANT OR ANY OF THE SECURITIES ISSUABLE UPON EXERCISE OF THIS WARRANT WITHOUT REQUIRING THE CONSENT OF THE ISSUER OR THE DELIVERY OF ANY SUCH OPINION.

THIS CERTIFIES that in consideration for services to be provided, Griffin Securities, Inc. or any subsequent holder hereof (the "**Holder**"), has the right to purchase from Synthetic Biologics, Inc., a Nevada corporation (the "**Company**"), up to Six Hundred Thirty Five Thousand Eight Hundred Fifty Five (635,855) fully paid and nonassessable shares of the Company's common stock, par value \$.001 per share (the "**Common Stock**"), subject to adjustment as provided herein, at a price per share equal to the Exercise Price (as defined below), at any time after the date of issue and ending at 5:00

p.m., New York time, on the fifth (5th) anniversary of the effective date of the offering to which this warrant relates.

1. Exercise.

(a) Right to Exercise; Exercise Price. The Holder shall have the right to exercise this Warrant at any time and from time to time as to all or any part of the shares of Common Stock issuable hereunder (the “**Warrant Shares**”). The “**Exercise Price**” for each Warrant Share purchased by the Holder upon the exercise of this Warrant shall be equal to \$1.60, subject to adjustment for the events specified in **Section 3** below. The Holder may pay the Exercise Price in either of the following forms or, at the election of the Holder, a combination thereof:

(i) through a cash exercise (a “**Cash Exercise**”) by delivering immediately available funds, or

(ii) through a cashless exercise (a “**Cashless Exercise**”). The Holder may effect a Cashless Exercise by surrendering this Warrant to the Company and noting on the Exercise Notice that the Holder wishes to effect a Cashless Exercise, upon which the Company shall issue to the Holder the number of Warrant Shares determined as follows:

$$X = Y \times (A-B)/A$$

where: X = the number of Warrant Shares to be issued to the Holder;

Y = the number of Warrant Shares with respect to which this Warrant is being exercised;

A = the Trading Price as of the Exercise Date; and

B = the Exercise Price.

For purposes of Rule 144, it is intended and acknowledged that the Warrant Shares issued in a Cashless Exercise transaction shall be deemed to have been acquired by the Holder, and the holding period for the Warrant Shares required by Rule 144 shall be deemed to have been commenced, on the Issue Date. For purposes hereof, (A) “**Trading Price**” shall mean the average daily VWAP for the Common Stock for the five trading days immediately preceding the Exercise Date and (B) “**VWAP**” on a trading day means the volume weighted average price of the Common Stock for such trading day on the principal market on which the Common Stock then trades as reported by Bloomberg Financial Markets or, if Bloomberg Financial Markets is not then reporting such prices, by a comparable reporting service of national reputation selected by the Company and reasonably satisfactory to the Holder. If VWAP cannot be calculated for the Common Stock on such trading day on any of the foregoing bases, then the Company shall submit such

calculation to an independent investment banking firm of national reputation, and shall cause such investment banking firm to perform such determination and notify the Company of the results of determination no later than two (2) business days from the time such calculation was submitted to it by the Company. All such determinations shall be appropriately adjusted for any stock dividend, stock split or other similar transaction during such period.

(b) Exercise Notice. In order to exercise this Warrant, the Holder shall (i) send by facsimile transmission, at any time prior to 5:00 p.m., New York time, on the business day on which the Holder wishes to effect such exercise (the “**Exercise Date**”), to the Company an executed copy of the notice of exercise in the form attached hereto as **Exhibit A** (the “**Exercise Notice**”), (ii) deliver the original Warrant and (iii) in the case of a Cash Exercise, pay the Exercise Price to the Company by wire transfer in immediately available funds. The Exercise Notice shall also state the name or names (with address) in which the shares of Common Stock that are issuable on such exercise shall be issued. If shares are to be issued in the name of a person other than the Holder, the Holder will pay all transfer taxes payable with respect thereto.

(c) Holder of Record. The Holder shall, for all purposes, be deemed to have become the holder of record of the Warrant Shares specified in an Exercise Notice on the Exercise Date specified therein, irrespective of the date of delivery of such Warrant Shares, subject to payment of the Exercise Price. Except as specifically provided herein, nothing in this Warrant shall be construed as conferring upon the Holder hereof any rights as a shareholder of the Company, including, without limitation, the right to vote, the right to receive dividends or other distributions made to shareholders of the Company, and the right to exercise preemptive rights, prior to the Exercise Date.

(d) Cancellation of Warrant. This Warrant shall be canceled upon its exercise and, if this Warrant is exercised in part, the Company shall, at the time that it delivers Warrant Shares to the Holder pursuant to such exercise as provided herein, issue a new warrant, and deliver to the Holder a certificate representing such new warrant, with terms identical in all respects to this Warrant (except that such new warrant shall be exercisable into the number of shares of Common Stock with respect to which this Warrant shall remain unexercised); provided, however, that the Holder shall be entitled to exercise all or any portion of such new warrant at any time following the time at which this Warrant is exercised, regardless of whether the Company has actually issued such new warrant or delivered to the Holder a certificate therefor.

2. Delivery of Warrant Shares Upon Exercise. Upon receipt of an Exercise Notice pursuant to **Section 1**, the Company shall, no later than the close of business on the later to occur of (i) the third (3rd) business day following the Exercise Date set forth in such Exercise Notice and (ii) the date on which the Company has received payment of the Exercise Price and the taxes specified in **Section 1(b)**, if any, are paid in full (a “**Delivery Date**”), issue and deliver or cause to be delivered to the Holder the number of Warrant Shares as shall be determined as provided herein. The Company shall effect delivery of Warrant Shares to the Holder by, as long as the Transfer Agent participates in the Depository Trust Company (“**DTC**”) Fast Automated Securities Transfer program (“**FAST**”), crediting the account of the Holder or its nominee at DTC (as specified in the applicable Exercise Notice) with the number of Warrant Shares required to be delivered, no later than the close of business on such Delivery Date. In the event that the Transfer Agent is not a participant in FAST, or if the Warrant Shares are not otherwise eligible for delivery through FAST, or if the Holder so specifies in an Exercise Notice or otherwise in writing on or before the Exercise Date, the Company shall effect delivery of Warrant Shares by delivering to the Holder or its nominee physical certificates representing such Warrant Shares, no later than the close of business on such Delivery Date.

3. Adjustments to Exercise Price; Distributions; Repurchase Right.

(a) Subdivision or Combination of Common Stock. If the Company, at any time after the Issue Date, subdivides (by any stock split, stock dividend, recapitalization, reorganization, reclassification or otherwise) its shares of Common Stock into a greater number of shares, then after the date of record for effecting such subdivision, the Exercise Price in effect immediately prior to such subdivision will be proportionately reduced. If the Company, at any time after the Issue Date, combines (by reverse stock split, recapitalization, reorganization, reclassification or otherwise) its shares of Common Stock into a smaller number of shares, then, after the date of record for effecting such combination, the Exercise Price in effect immediately prior to such combination will be proportionally increased. Any adjustment made pursuant to this *Section 3(a)* that results in a decrease or increase in the Exercise Price shall also effect a proportional increase or decrease, as the case may be, in the number of shares of Common Stock into which this Warrant is exercisable.

(b) Distributions. If the Company shall declare or make any distribution of its assets (or rights to acquire its assets) to holders of Common Stock as a partial liquidating dividend or otherwise (including any dividend or distribution to the Company's stockholders in cash or shares (or rights to acquire shares) of capital stock of a subsidiary) (a "*Distribution*"), the Company shall deliver written notice of such Distribution (a "*Distribution Notice*") to the Holder at least fifteen (15) business days prior to the earlier to occur of (i) the record date for determining stockholders entitled to such Distribution (the "*Record Date*") and (ii) the date on which such Distribution is made (the "*Distribution Date*"). The Holder shall be entitled, at its option (to be exercised by written notice delivered to the Company on or before the fifteenth (15th) business day following the date on which a Distribution Notice is delivered to the Holder), either (A) upon any exercise of this Warrant on or after the Record Date, to be entitled to receive, on the Distribution Date (for any exercise effected prior to the Distribution Date) or the applicable Delivery Date (for any exercise effected after the Distribution Date), the amount of such assets which would have been payable to the holder with respect to the shares of Common Stock issuable upon such exercise (without giving effect to any limitations on such exercise contained in this Warrant or the Purchase Agreement) had the Holder been the holder of such shares of Common Stock on the Record Date or (B) upon any exercise of this Warrant on or after the Distribution Date, to reduce the Exercise Price applicable to such exercise by reducing the Exercise Price in effect on the business day immediately preceding the Record Date by an amount equal to the fair market value of the assets to be distributed divided by the number of shares of Common Stock as to which such Distribution is to be made, such fair market value to be reasonably determined in good faith by the independent members of the Company's Board of Directors. Notwithstanding anything herein to the contrary, if the Holder does not notify the Company of whether the Holder has elected clause (A) or (B) in the preceding sentence by the date that is fifteen (15) business days after the date on which the Company delivers a Distribution Notice to the Holder, the Company shall have the right, exercisable upon written notice to the Holder, to determine whether clause (A) or (B) shall be applicable to exercises of this Warrant effected on or after the Distribution Date.

L. Major Transactions. In the event of a merger, consolidation, business combination, tender offer, exchange of shares, recapitalization, reorganization, redemption or other similar event, as a result of which shares of Common Stock shall be changed into the same or a different number of shares of the same or another class or classes of stock or securities or other assets of the Company or another entity or the Company shall sell all or substantially all of its assets (each of the foregoing being a “*Major Transaction*”), the Company will give the Holder at least ten (10) Trading Days’ written notice prior to the earlier of (I) the closing or effectiveness of such Major Transaction and (II) the record date for the receipt of such shares of stock or securities or other assets, and the Holder shall be permitted to exercise this Warrant in whole or in part at any time prior to the record date for the receipt of such consideration and shall be entitled to receive, for each share of Common Stock issuable to the Holder upon such exercise, the same per share consideration payable to the other holders of Common Stock in connection with such Major Transaction. If and to the extent that the Holder retains this Warrant or any portion hereof following such record date, the Company will cause the surviving or, in the event of a sale of assets, purchasing entity, as a condition precedent to such Major Transaction, to assume the obligations of the Company with respect to this Warrant, with such adjustments to the Exercise Price and the securities covered hereby as may be necessary in order to preserve the economic benefits of this Warrant to the Holder.

5. Registration Rights. . The Holder shall have the same rights and obligations and be subject to the same limitations, as the purchasers set forth in the Registration Rights Agreement dated the date hereof as though it were directly party thereto and for the purposes of the term Registrable Securities under the Registration Rights Agreement, the Warrant Shares shall be deemed to be Registrable Securities.

6. Fractional Interests. No fractional shares or scrip representing fractional shares shall be issuable upon the exercise of this Warrant. If, on exercise of this Warrant, the Holder hereof would be entitled to a fractional share of Common Stock or a right to acquire a fractional share of Common Stock, the Company shall, in lieu of issuing any such fractional share, pay to the Holder an amount in cash equal to the product resulting from multiplying such fraction by the Trading Price as of the Exercise Date.

7. Transfer of this Warrant. The Holder may not sell, transfer, assign, pledge or otherwise dispose of this Warrant, in whole or in part, unless such sale or other disposition is made pursuant to an effective registration statement or the Holder provides the Company with an opinion of counsel reasonably acceptable to the Company that the transfer may be made without registration under the Securities Act and applicable state securities laws an exemption from the registration requirements of the Securities Act, and applicable state securities laws. Upon such transfer or other disposition, the Holder shall deliver this Warrant to the Company together with a written notice to the Company, substantially in the form of the Transfer Notice attached hereto as *Exhibit B* (a “*Transfer Notice*”), indicating the person or persons to whom this Warrant shall be transferred and, if less than all of this Warrant is transferred, the number of Warrant Shares to be covered by the part of this Warrant to be transferred to each such person. Within ten (10) business days of receiving a Transfer Notice and the original of this Warrant, the Company shall deliver to the each transferee designated by the Holder a Warrant or Warrants of like tenor and terms for the appropriate number of Warrant Shares and, if less than all this Warrant is transferred, shall deliver to the Holder a Warrant for the remaining number of Warrant Shares.

8. Benefits of this Warrant; Headings. This Warrant shall be for the sole and exclusive benefit of the Holder of this Warrant and nothing in this Warrant shall be construed to confer upon any person other than the Holder of this Warrant any legal or equitable right, remedy or claim hereunder. The headings used in this Warrant are for convenience of reference only and shall not limit or otherwise affect the meaning hereof.

9. Loss, theft, destruction or mutilation of Warrant. Upon receipt by the Company of evidence of the loss, theft, destruction or mutilation of this Warrant, and (in the case of loss, theft or destruction) of indemnity reasonably satisfactory to the Company, and upon surrender of this Warrant, if mutilated, the Company shall execute and deliver a new Warrant of like tenor and date in replacement for the lost, stolen, destroyed or mutilated Warrant.

10. Notice or Demands. Any notice, demand or request required or permitted to be given by the Company or the Holder pursuant to the terms of this Warrant shall be in writing and shall be deemed delivered (i) when delivered personally or by verifiable facsimile transmission, unless such delivery is made on a day that is not a business day, in which case such delivery will be deemed to be made on the next succeeding business day, (ii) on the next business day after timely delivery to an overnight courier and (iii) on the business day actually received if deposited in the U.S. mail (certified or registered mail, return receipt requested, postage prepaid), addressed as follows:

If to the Company or the Issuer:

Synthetic Biologics, Inc.
617 Detroit Avenue, Suite 100
Ann Arbor, MI 48104
Tel: (734) 332-7800
Fax: (734) 332-7878

and if to the Holder, to such address as shall be designated by the Holder in writing to the Company.

11. Taxes. The issue of stock certificates on exercises of this Warrant shall be made without charge to the exercising Holder for any tax in respect of the issue thereof. The Company shall not, however, be required to pay any tax which may be payable in respect of any transfer involved in the issue and delivery of stock in any name other than that of the Holder of any Warrant exercised, and the Company shall not be required to issue or deliver any such stock certificate unless and until the person or persons requesting the issue thereof shall have paid to the Company the amount of such tax or shall have established to the reasonable satisfaction of the Company that such tax has been paid.

12. Governing Law. This Warrant shall be governed by and construed under the laws of the State of New York applicable to contracts made and to be performed entirely within the State of New York. The Company hereby irrevocably submits to the non-exclusive jurisdiction of the state and federal courts sitting in the City of New York for

the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. The Company hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to it at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law.

13. Amendments. Except as expressly provided herein, neither this Warrant nor any term hereof may be amended except pursuant to a written instrument executed by the Company and the Holder, and no provision hereof may be waived other than by a written instrument signed by the party against whom enforcement of any such waiver is sought. Any waiver or consent shall be effective only in the specific instance and for the specific purpose for which given.

14. Successors and Assigns. This Warrant shall be binding upon the successors and permitted assigns of the parties. The Company may not assign its rights or obligations under this Agreement without the prior written consent of the Holder, which consent shall not be unreasonably withheld.

15. Legend. This Warrant and, except in the event (i) there is an effective Registration Statement permitting the resale of the Warrant Shares by the Holder, or (ii) the Company has received on an opinion from counsel reasonably acceptable to the Company that the legend may be removed, all certificates representing shares of Warrant Shares issued upon exercise hereof shall be stamped or imprinted with a legend in substantially in the form set forth on the first page of this Warrant:

IN WITNESS WHEREOF, the Company has duly executed and delivered this Warrant as of the Issue Date.

SYNTHETIC
BIOLOGICS, INC.

By:

Name:
Jeffrey
Riley
Title:
President
and Chief
Executive
Officer

EXHIBIT A to WARRANT

EXERCISE NOTICE

The undersigned Holder hereby irrevocably exercises the right to purchase _____ of the shares of Common Stock ("Warrant Shares") of _____ (the "Company") evidenced by the attached Warrant (the "Warrant"). Capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Warrant.

I. Form of Exercise Price. The Holder intends that payment of the Exercise Price shall be made as:

_____ a Cash Exercise with respect to _____ Warrant Shares; and/or

_____ a Cashless Exercise with respect to _____ Warrant Shares, as permitted by Section 1(a) of the attached Warrant.

J. Payment of Exercise Price. In the event that the Holder has elected a Cash Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the Holder shall pay the sum of \$_____ to the Company in accordance with the terms of the Warrant.

By tendering this Exercise Notice, the Holder represents to the Company that it is an "accredited investor" as that term is defined in Rule 501 of Regulation D under the Securities Act, and that it is acquiring the Warrants Shares solely for its own account, and not with a present view to the public resale or distribution of all or any part thereof.

Date:

Name of
Registered
Holder

By:

Name:

Title:

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EXHIBIT B to WARRANT

TRANSFER NOTICE

FOR VALUE RECEIVED, the undersigned Holder of the attached Warrant hereby sells, assigns and transfers unto the person or persons named below the right to purchase _____ shares of the Common Stock of _____ evidenced by the attached Warrant.

Date:

Name of
Registered
Holder

By:
Name:
Title:

By tendering this Transfer Notice, the above named transferee represents to the Company that it is an “accredited investor” as that term is defined in Rule 501 of Regulation D under the Securities Act, and that it is acquiring the Warrants solely for its own account, and not with a present view to the public resale or distribution of all or any part thereof.

Transferee

Synthetic Biologics Completes \$10.8 Million Private Placement Financing

For Immediate Release

Rockville, MD, October 31, 2012 – Synthetic Biologics, Inc. (NYSE MKT: SYN), a developer of synthetic biologics and innovative medicines for serious diseases and unmet medical needs, announced today the successful completion of its previously announced private placement in connection with stock purchase agreements dated October 25, 2012. The Company sold approximately 6.8 million shares of its common stock at a purchase price of \$1.60 per share to new and existing investors for gross proceeds of approximately \$10.8 million. This transaction was completed at a discount to market and no warrants were issued to the investors. Existing investors and an affiliate of R.J. Kirk constituted a majority of the participating investors in this transaction.

“We are very pleased to complete this financing and to receive such solid support from both our new and existing investors, who share our vision of the emerging field of synthetic biologics,” stated Jeffrey Riley, Chief Executive Officer of Synthetic Biologics, Inc. “This new capital provides us with a strong cash position going forward. It allows us to advance our lead programs to develop monoclonal antibody therapies for certain infectious diseases and a synthetic DNA-based therapy for pulmonary arterial hypertension through our Exclusive Channel Collaborations with Intrexon Corporation. We believe that we are well-positioned to achieve significant milestones related to these cutting edge development programs.”

In addition to funding the Company’s monoclonal antibody and synthetic DNA programs, the net proceeds are intended to be used for general corporate purposes, including the execution of its business plan as well as the expansion and advancement of its pipeline.

The common stock sold in the private placement transaction has not been registered under the Securities Act of 1933, as amended (the “Securities Act”), or applicable state securities laws and was issued and sold in reliance upon the exemption from registration contained in Section 4(2) of the Securities Act and Regulation D promulgated thereunder. Accordingly, the securities issued in the private placement may not be offered or sold in the United States except pursuant to an effective registration statement or an applicable exemption from the registration requirements of the Securities Act and such applicable state securities laws.

The Company has also agreed to provide registration rights to the investors with respect to the shares issued to them in this private placement.

Griffin Securities, Inc. served as the Company's exclusive financial advisor and placement agent for the offering.

This press release does not constitute an offer to sell or the solicitation of an offer to buy the Company's securities, nor shall there be any sale of the securities in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to the registration or qualification under the securities laws of such jurisdiction.

About Synthetic Biologics, Inc.

Synthetic Biologics is a biotechnology company focused on the development of product candidates to address serious diseases and unmet medical needs. Synthetic Biologics is developing a series of monoclonal antibodies (mAbs) for the treatment of serious infectious diseases not adequately addressed by existing therapies and a synthetic DNA-based therapy for the treatment of pulmonary arterial hypertension (PAH). The Company is also developing a drug candidate for the treatment of relapsing-remitting multiple sclerosis (MS) and cognitive dysfunction in MS, and designing a clinical development pathway for the treatment of amyotrophic lateral sclerosis (ALS). For more information, please visit Synthetic Biologics' website at www.syntheticbiologics.com.

This release includes forward-looking statements on Synthetic Biologics' current expectations and projections about future events. In some cases forward-looking statements can be identified by terminology such as "may," "should," "potential," "continue," "expects," "anticipates," "intends," "plans," "believes," "estimates," and similar expressions. These statements are based upon current beliefs, expectations and assumptions and are subject to a number of risks and uncertainties, many of which are difficult to predict and include statements regarding our ability to achieve milestones, the use of proceeds and the impact of the financing. The forward-looking statements are subject to risks and uncertainties that could cause actual results to differ materially from those set forth or implied by any forward-looking statements. Important factors that could cause actual results to differ materially from those reflected in Synthetic Biologics' forward-looking statements include, among others, the allocation of resources among different potential uses, unanticipated expenses that could cause a change in our use of proceeds or require additional funds, a failure of our clinical trials to be completed on time or to achieve desired results, a failure to develop our product candidates successfully and other factors described in Synthetic Biologics' report on Form 10-K/A for the year ended December 31, 2011 and any other filings with the SEC. The information in this release is provided only as of the date of this release, and Synthetic Biologics undertakes no obligation to update any forward-looking statements contained in this release on account of new information, future events, or otherwise, except as required by law.

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