

PROSPECTUS



**6,344,966 Shares of Common Stock Issuable Upon
Exercise of Outstanding Warrants**

This prospectus relates to the offer and sale by us of 6,344,966 shares of our common stock, par value \$0.001 per share, that are issuable at an exercise price of \$0.69 per share from time to time upon the exercise of outstanding warrants that we issued in October 2018 (the "October 2018 Warrants") as part of a follow-on underwritten public offering. We will receive the proceeds from any cash exercises of the outstanding October 2018 Warrants. Each October 2018 Warrant is exercisable at any time until its expiration date, which is October 15, 2023 (the date that is five years from the date on which the October 2018 Warrants were initially issued by us in a firm commitment public offering). No securities are being offered pursuant to this prospectus other than the 6,344,966 shares of our common stock that will be issued upon exercise of the previously issued and outstanding October 2018 Warrants.

Our common stock is listed on the NYSE American LLC under the symbol "SYN." The last reported sale price of our common stock on the NYSE American LLC on October 20, 2021 was \$0.438 per share. We urge prospective purchasers of our common stock to obtain current information about the market prices of our common stock.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading "Risk Factors" contained in the applicable prospectus supplement and in any free writing prospectuses we have authorized for use in connection with a specific offering, and under similar headings in the other documents that are incorporated by reference into this prospectus.

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

The date of this prospectus is November 2, 2021

TABLE OF CONTENTS

	<u>Page</u>
ABOUT THIS PROSPECTUS	ii
PROSPECTUS SUMMARY	1
THE OFFERING	4
RISK FACTORS	5
SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS	6
USE OF PROCEEDS	7
DILUTION	8
DIVIDEND POLICY	9
DESCRIPTION OF OUR CAPITAL STOCK	10
DESCRIPTION OF WARRANTS	13
PLAN OF DISTRIBUTION	15
LEGAL MATTERS	16
EXPERTS	16
WHERE YOU CAN FIND MORE INFORMATION	16
INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE	16

You should rely only on the information we have provided or incorporated by reference in this prospectus or in any prospectus supplement. We have not authorized anyone to provide you with information different from that contained or incorporated by reference in this prospectus or in any prospectus supplement. This prospectus and any prospectus supplement is an offer to sell only the securities offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. You should assume that the information contained in this prospectus and in any prospectus supplement is accurate only as of their respective dates and that any information we have incorporated by reference is accurate only as of the date of the document incorporated by reference, regardless of the time of delivery of this prospectus or any prospective supplement or any sale of securities. The registration statement, including the exhibits and the documents incorporated herein by reference, can be read on the Securities and Exchange Commission website or at the Securities and Exchange Commission offices mentioned under the heading "Where You Can Find More Information."

ABOUT THIS PROSPECTUS

This prospectus is not an offer or solicitation in respect to these securities in any jurisdiction in which such offer or solicitation would be unlawful. This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission (the "SEC"). We have not authorized anyone else to provide you with different information or additional information. You should not assume that the information in this prospectus, or any supplement or amendment to this prospectus, is accurate at any date other than the date indicated on the cover page of such documents.

Unless otherwise stated or the context otherwise requires, references in this prospectus to “Synthetic” the “Company,” “we,” “our” and “us” refer to Synthetic Biologics, Inc., a Nevada corporation, and its consolidated subsidiaries, unless otherwise specified. When we refer to “you,” we mean the holders of the applicable series of securities.

This prospectus and the information incorporated herein by reference include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus, any applicable prospectus supplement or any related free writing prospectus are the property of their respective owners.

PROSPECTUS SUMMARY

The items in the following summary are described in more detail elsewhere in this prospectus and in the documents incorporated by reference herein. This summary provides an overview of selected information and does not contain all the information you should consider before investing in our securities. Therefore, you should carefully read the entire prospectus, any prospectus supplement and any free writing prospectus that we have authorized for use in connection with this offering, including the “Risk Factors” section and other documents or information included or incorporated by reference in this prospectus, including the more detailed consolidated financial statements, notes to the consolidated financial statements and other information incorporated by reference from our other filings with the Securities and Exchange Commission, (the “SEC”), or included in any applicable prospectus supplement, before making any investment decision.

Overview

We are a diversified clinical-stage company developing therapeutics designed to treat gastrointestinal (GI) diseases in areas of high unmet need. Our lead clinical development candidates are: (1) SYN-004 (ribaxamase) which is designed to degrade certain commonly used intravenous (IV) beta-lactam antibiotics within the GI tract to prevent microbiome damage, *Clostridioides difficile* infection (CDI), overgrowth of pathogenic organisms, the emergence of antimicrobial resistance (AMR), and acute graft-versus-host-disease (aGVHD) in allogeneic hematopoietic cell transplant (HCT) recipients, and (2) SYN-020, a recombinant oral formulation of the enzyme intestinal alkaline phosphatase (IAP) produced under cGMP conditions and intended to treat both local GI and systemic diseases.

We plan to explore and evaluate a range of strategic options, which may include: in-licensing opportunities; evaluation of potential acquisitions; or other potential strategic transactions. In the meantime, we remain focused on working with our clinical development partners to advance the planned Phase 1b/2a clinical trial of SYN-004 (ribaxamase) in allogeneic HCT patients, and advancing the clinical development program for SYN-020 intestinal alkaline phosphatase (IAP) in multiple potential indications.

We are continuing to assess the potential impact of the COVID-19 pandemic. We are in close contact with our clinical development partners in order to assess the impact of COVID-19 on our studies and current timelines and costs. While we currently do not anticipate any interruptions in our operations due to COVID-19, it is possible that if the COVID-19 pandemic were to increase in severity for an extended period of time, we could once again experience delays in our clinical trials which could result in significant disruptions to our clinical development timelines due to the COVID-19 pandemic, which would adversely affect our business, financial condition, results of operations and growth prospects.

In response to the spread of COVID-19 as well as public health directives and orders, we have implemented a number of measures designed to ensure employee safety and business continuity. We have limited access to our offices and are allowing our administrative employees to continue their work outside of our offices in order to support the community efforts to reduce the transmission of COVID-19 and protect employees, complying with guidance from federal, state and local government and health authorities. The full extent to which the COVID-19 outbreak will directly or indirectly impact our business, results of operations and financial condition will depend on future developments that are highly uncertain and cannot be accurately predicted. The effects of the governmental orders and our work-from-home policies may negatively impact productivity, disrupt our business and delay our clinical programs and timelines, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations on our ability to conduct our business in the ordinary course.

Company History

Our predecessor, Sheffield Pharmaceuticals, Inc., was incorporated in 1986, and in 2006 engaged in a reverse merger with Pipex Therapeutics, Inc., a Delaware corporation formed in 2001. After the merger, we changed our name to Pipex Pharmaceuticals, Inc., and in October 2008 we changed our name to Adeona Pharmaceuticals, Inc. On October 15, 2009, we engaged in a merger with a wholly owned subsidiary for the purpose of reincorporating in the State of Nevada. After reprioritizing our focus on the emerging area of synthetic biologics and entering into our first collaboration with Intrexon, we amended our Articles of Incorporation to change our name to Synthetic Biologics, Inc. on February 15, 2012.

Corporate Information

Our executive offices are located at 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850. Our telephone number is (301) 417-4364, and our website address is www.syntheticbiologics.com. The information contained on our website is not part of and should not be construed as being incorporated by reference into this prospectus supplement.

Summary Risk Factors

The following is a summary of the key risks relating to our Company. You should review carefully the risks and uncertainties more fully described under the heading "Risk Factors" contained in the applicable prospectus supplement and in any free writing prospectuses we have authorized for use in connection with a specific offering, and under similar headings in the other documents that are incorporated by reference into this prospectus.

Business Risks

- We will need to raise additional capital and may be unable to raise the necessary capital to operate our business or obtain funding on acceptable terms or at all, which may reduce or eliminate our development programs or commercialization efforts.
- The continued impact of the COVID-19 pandemic on our planned operations and clinical studies.
- We have a history of incurring substantial losses and negative operating cash flow and expect to continue to incur significant operating and capital expenditures.
- We have no significant sources of revenue and may never generate significant revenue.
- Our research and development efforts may not succeed in developing a commercially successful product or technology.
- We are largely dependent on the success of our lead product candidates, SYN-004 and SYN-020, which require significant additional clinical testing before we can seek regulatory approval and we cannot be certain that these product candidates will receive regulatory approval or be successfully commercialized.
- We may not be able to retain rights licensed to us by others to commercialize key products and may not be able to establish or maintain the relationships we need to develop, manufacture, and market our products.
- We face strong competition and may not be able to compete effectively and our competitors may develop and/or gain FDA approval of our product candidates for a different indication.
- Our ability to develop, manufacture and market our product candidates may be delayed or impaired for reasons that are beyond our control due to our reliance on third party suppliers for raw materials and services.
- We may not be able to manufacture our product candidates in commercial quantities, which would prevent us from commercializing our product candidates.
- We rely extensively on our information technology systems and are vulnerable to damage and interruption and any failure to maintain the security of information relating to our customers, employees and suppliers, whether as a result of cybersecurity attacks or otherwise, could expose us to litigation, government enforcement actions and costly response measures, and could disrupt our operations and harm our reputation.

Regulatory Risks

- We may not be able to obtain the necessary regulatory approvals in the U.S. and/or other countries.
- Clinical trials are expensive, time consuming, and difficult to design and implement, and may return results that may not support our product candidate claims and the results of preclinical studies and completed clinical trials are not necessarily predictive of future results.
- We may have difficulties in enrolling patients in our clinical trials, or experience delays in enrollment, which could result in increased costs and/or delay our ability to generate revenue.
- Patients who are administered our product candidates may experience unexpected side effects or other safety risks that could cause a halt in their clinical development, preclude approval of our product candidates or limit their commercial potential.

· Our product candidates, if approved for sale, may not gain acceptance among physicians, patients and the medical community, thereby limiting our potential to generate revenues.

· We currently have no marketing, sales or distribution organization and have no experience in marketing products as a company. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our product candidates, we may not be able to generate product revenue.

Intellectual Property Risks

· If product liability lawsuits are successfully brought against us, we may incur substantial liabilities and may be required to limit commercialization of our product candidates.

· We rely on patent applications and various regulatory exclusivities to protect some of our product candidates and our ability to compete may be limited or eliminated if we are not able to protect our products. Additionally, litigation or other proceedings relating to protecting our intellectual property is costly and time consuming.

Risks Related To our Securities

· Our failure to continue to meet the other listing requirements could result in a de-listing of our common stock.

· We expect to seek to raise additional capital in the future, which may be dilutive to stockholders or impose operational restrictions.

· The market price of our common stock has been and may continue to be volatile and adversely affected by various factors.

Risks Related To This Offering

· Resales of our common stock in the public market by our stockholders may cause the market price of our common stock to fall.

· There may be further sales or other dilution of our equity, which may adversely affect the market price of our common stock.

· Our management will have broad discretion over the use of the net proceeds from this offering and you may not agree with how we use the proceeds and the proceeds may not be invested successfully.

· If the holders of the October 2018 Warrants exercise the 2018 Warrants, they may experience immediate and substantial dilution in the book value per share of common stock they hold.

October 2018 Underwritten Public Offering

On October 15, 2018, we closed an underwritten public offering pursuant to which we received gross proceeds of approximately \$18.6 million before deducting underwriting discounts, commissions and other offering expenses payable by us and sold an aggregate of (i) 2,520,000 Class A Units (the “Class A Units”), with each Class A Unit consisting of one share of our common stock, \$0.001 par value per share (the “common stock”), and one five-year warrant to purchase one share of common stock at an initial exercise price of \$1.38 per share, which subsequently was reduced to \$0.69 per share (the “Class A Warrants”), with each Class A Unit to be offered to the public at a public offering price of \$1.15, and (ii) 15,723 Class B Units (the “Class B Units”), with each Class B Unit offered to the public at a public offering price of \$1,000 per Class B Unit and consisting of one share of our Series B Convertible Preferred Stock (the “Series B Preferred Stock”), with a stated value of \$1,000 and convertible into shares of our common stock at the stated value divided by a conversion price of \$1.15 per share, with all shares of Series B Preferred Stock convertible into an aggregate of 13,672,173 shares of common stock, and issued with an aggregate of 13,672,173 warrants (the “Class B Warrants”, and together with the Class A Warrants, the “October 2018 Warrants”). In addition, pursuant to the underwriting agreement that we had entered into with A.G.P./Alliance Global Partners (the “Underwriters”), as representative of the underwriters, we granted the Underwriters a 45day option (the “Over-allotment Option”) to purchase up to an additional 2,428,825 shares of common stock and/or additional October 2018 Warrants to purchase an additional 2,428,825 shares of common stock. The Underwriters partially exercised the Over-allotment Option by electing to purchase from us additional October 2018 Warrants to purchase 1,807,826 shares of common stock.

On November 16, 2020, the exercise price of the October 2018 Warrants was reduced from \$1.38 per warrant per full share of our common stock to \$0.69 per October 2018 Warrant per full share of common stock in accordance with the anti-dilution terms of the October 2018 Warrants. The reduction was the result of the issuance of shares of common stock by us through our “at the market offering” facility. The effect of the change in the exercise price of the October 2018 Warrants as a result of the triggering of the down round protection clause in the warrants was recorded as a deemed dividend of \$880,000 during the year ended December 31, 2020, which reduces the income available to common stockholders. The exercise price and the number of shares of common stock purchasable upon the exercise of each October 2018 Warrant are subject to adjustment upon the happening of certain events, such as stock dividends, distributions, and split.

The Registration Statement of which this prospectus is a part is intended to ensure that an effective registration statement covers all shares of common stock issuable upon exercise of the outstanding and unexercised October 2018 Warrants. As of the date of this prospectus, an aggregate of 6,344,966 shares of common stock remain issuable upon exercise of the October 2018 Warrants, which expire on October 15, 2023.

THE OFFERING

Common stock offered by us pursuant to this prospectus

6,344,966 shares of common stock issuable upon exercise of the October 2018 Warrants, which warrants are exercisable until October 15, 2023 (the fifth anniversary of the original issuance date of the October 2018 Warrants) at an exercise price of \$0.69 per share.

Common stock to be outstanding after this offering if all of the October 2018 Warrants are exercised

138,387,505 shares.⁽¹⁾

<p>Use of proceeds</p>	<p>The amount of proceeds from this offering will depend upon the number of shares of our common stock issued upon exercise of the October 2018 Warrants. There can be no assurance that any warrants will be exercised.</p> <p>We intend to use the net proceeds, if any, from this offering for general corporate purposes, which may include, among other things, for clinical trials for our product candidates, paying general and administrative expenses and accounts payable, increasing our working capital, funding research and development and funding capital expenditures. We may also use a portion of the net proceeds for licensing or acquiring intellectual property to incorporate into our products and product candidates or our research and development programs and to in-license, acquire or invest in other businesses or products, although we have no commitments or agreements with respect to any such licenses, acquisitions or investments as of the date of this prospectus supplement. See “<u>Use of Proceeds</u>.”</p> <p>The net proceeds from any disposition of the shares of common stock covered hereby would be received by the investors selling such shares. We will not receive any of the proceeds from any such sale of the common stock offered by this prospectus other than the net proceeds of any October 2018 Warrants exercised for cash.</p>
<p>Risk factors</p>	<p>See “<u>Risk Factors</u>” beginning on page 3 of this prospectus and the other information included in, or incorporated by reference into, this prospectus for a discussion of certain factors you should carefully consider before deciding to invest in shares of our common stock.</p>
<p>NYSE American LLC Symbol</p>	<p>“SYN”</p>
<p>(1) Based on 132,042,537 shares of common stock issued and outstanding on October 21, 2021.</p>	

RISK FACTORS

Investing in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks and uncertainties described below and any related free writing prospectus, and discussed under the section entitled “Risk Factors” contained in our most recent Annual Report on Form 10-K and our subsequent Quarterly Reports on Form 10-Q, as such filings may be updated by subsequent annual, quarterly and other reports that are incorporated by reference into this prospectus in their entirety. The risks described in these documents are not the only ones we face, but those that we consider to be material. There may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that could have material adverse effects on our future results. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, financial condition, results of operations or cash flows could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below entitled “Special Note Regarding Forward-Looking Statements.”

Risks Related to this Offering

Resales of our common stock in the public market by our stockholders may cause the market price of our common stock to fall.

We may issue common stock from time to time, including in connection with the exercise of the October 2018 Warrants. The issuance from time to time of these new shares of our common stock, or our ability to issue new shares of common stock from time to time, could result in resales of our common stock by our current stockholders concerned about the potential dilution of their holdings. In turn, these resales could have the effect of depressing the market price for our common stock.

There may be future sales or other dilution of our equity, which may adversely affect the market price of our common stock.

We are generally not restricted from issuing additional common stock, including any securities that are convertible into or exchangeable for, or that represent the right to receive, common stock. The market price of our common stock could decline as a result of sales of common stock or securities that are convertible into or exchangeable for, or that represent the right to receive, common stock after this offering or the perception that such sales could occur.

Our management will have broad discretion over the use of the net proceeds from this offering and you may not agree with how we use the proceeds, and the proceeds may not be invested successfully.

We have not designated any portion of the net proceeds from this offering to be used for any particular purpose. Accordingly, our management will have broad discretion as to the use of the net proceeds from this offering and could use them for purposes other than those contemplated at the time of the commencement of the offering of the October 2018 Warrants and as of the date of this prospectus. Accordingly, you will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that, pending their use, we may invest the net proceeds in a way that does not yield a favorable, or any, return for our company.

If the holders of the October 2018 Warrants exercise the October 2018 Warrants, they may experience immediate and substantial dilution in the book value per share of the common stock they hold.

This offering involves the offer and sale by us of up to 6,344,966 shares of our common stock that are currently issuable upon the exercise of the October 2018 Warrants. The exercise price of the October 2018 Warrants at the time of exercise may be substantially higher than the book value per share of our common stock, and the holders of the October 2018 Warrants may suffer immediate and substantial dilution in the net tangible book value of the common stock acquired upon exercise of October 2018 Warrants. The exercise of outstanding stock options and other outstanding warrants may result in further dilution of your investment. See “Dilution” for a more detailed discussion of the dilution you may incur in connection with this offering.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Some of the statements contained or incorporated by reference in this prospectus may include forward-looking statements that reflect our current views with respect to our ongoing and planned clinical trials, business strategy, business plan, financial performance and other future events. These statements include forward-looking statements both with respect to us, specifically, and the biotechnology sector, in general. We make these statements pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Statements that include the words “expect,” “intend,” “plan,” “believe,” “project,” “estimate,” “may,” “should,” “anticipate,” “will” and similar statements of a future or forward-looking nature identify forward-looking statements for purposes of the federal securities laws or otherwise.

All forward-looking statements involve inherent risks and uncertainties, and there are or will be important factors that could cause actual results to differ materially from those indicated in these statements. We believe that these factors include, but are not limited to, those factors set forth under the caption “Risk Factors” in this prospectus and under the captions “Risk Factors,” “Business,” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” in our most recent Annual Report on Form 10-K and our subsequent Quarterly Reports on Form 10-Q, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus. We undertake no obligation to publicly update or review any forward-looking statement, whether as a result of new information, future developments or otherwise.

If one or more of these or other risks or uncertainties materializes, or if our underlying assumptions prove to be incorrect, actual results may vary materially from what we anticipate. All subsequent written and oral forward-looking statements attributable to us or individuals acting on our behalf are expressly qualified in their entirety by this Note. Before purchasing any of our securities, you should consider carefully all of the factors set forth or referred to in this prospectus that could cause actual results to differ.

6

USE OF PROCEEDS

The amount of proceeds from this offering will depend upon the number of shares of our common stock issued upon exercise of the October 2018 Warrants. There can be no assurance that any warrants will be exercised.

We intend to use the net proceeds, if any, from this offering for general corporate purposes, which may include, among other things, for clinical trials for our product candidates, paying general and administrative expenses and accounts payable, increasing our working capital, funding research and development and funding capital expenditures. We may also use a portion of the net proceeds for licensing or acquiring intellectual property to incorporate into our products and product candidates or our research and development programs and to in-license, acquire or invest in other businesses or products, although we have no commitments or agreements with respect to any such licenses, acquisitions or investments as of the date of this prospectus supplement.

The net proceeds from any disposition of the shares of common stock covered hereby would be received by the investors selling such shares. We will not receive any of the proceeds from any such sale of the common stock offered by this prospectus other than the net proceeds of any October 2018 Warrants exercised for cash.

7

DILUTION

If you purchase shares of our common stock in this offering, you will experience dilution to the extent of the difference between the offering price per share and the as adjusted net tangible book value per share after giving effect to this offering.

As of June 30, 2021, our net tangible book value was approximately \$73.7 million, or approximately \$0.558 per share of common stock. “Net tangible book value” is total assets minus the sum of liabilities and intangible assets. “Net tangible book value per share” is net tangible book value divided by the total number of shares outstanding.

After giving effect to the issuance of the common stock to investors exercising the October 2018 Warrants for cash at \$0.69 per share, our as adjusted net tangible book value as of June 30, 2021 would have been approximately \$78.1 million or \$0.564 per share of common stock. This represents an immediate increase in net tangible book value of \$0.006 per share to our existing stockholders and an immediate dilution in net tangible book value of \$0.126 per share to investors exercising the October 2018 Warrants at a price of \$0.69 per share, which is the exercise price of the outstanding Warrants. The following table illustrates this dilution per share to investors participating in this offering:

Exercise price per share		\$	0.69
Net tangible book value per share as of June 30, 2021	\$	0.558	
Increase in net tangible book value per share attributable to existing investors in this offering	\$	0.006	
As adjusted net tangible book value per share after giving effect to this offering		\$	0.564
Dilution per share to new investors		\$	0.126

The foregoing discussion and table do not take into account further dilution to new investors that could occur upon the exercise of outstanding options or warrants having a per share exercise price less than the exercise price of the October 2018 Warrants. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

8

DIVIDEND POLICY

We have never paid cash dividends on our common stock. Moreover, we do not anticipate paying periodic cash dividends on our common stock for the foreseeable future. We intend to use all available cash and liquid assets in the operation and growth of our business, subject to terms of any preferred stock or debt securities. Any future determination about the payment of dividends will be made at the discretion of our board of directors and will be subject to the rights of any outstanding preferred stock and will depend upon our earnings, if any, capital requirements, operating and financial conditions and on such other factors as our board of directors deems relevant.

9

DESCRIPTION OF OUR CAPITAL STOCK

Authorized Capital

Our authorized capital consists of 200,000,000 shares of common stock, par value \$0.001 per share, and 10,000,000 shares of preferred stock, par value \$0.001 per share. As of October 21, 2021, we had 132,042,537 shares of common stock were issued and outstanding, and no shares of preferred stock were issued and outstanding.

Common Stock

Authorized Shares of common stock. We currently have authorized 200,000,000 million shares of common stock. As of October 21, 2021, we had 132,042,537 shares of common stock outstanding.

Voting Rights. The holders of the common stock are entitled to one vote for each share held of record on all matters submitted to a vote of the stockholders, including the election of directors, and do not have cumulative voting rights. Accordingly, the holders of a majority of the shares of the common stock entitled to vote in any election of directors can elect all of the directors standing for election.

Dividend Rights. Subject to preferences that may be applicable to any then outstanding preferred stock, the holders of common stock are entitled to receive dividends, if any, as may be declared from time to time by our board of directors out of legally available funds.

Liquidation Rights. In the event of our liquidation, dissolution or winding up, holders of the common stock will be entitled to share ratably in the net assets legally available for distribution to stockholders after the payment of all of our debts and other liabilities, subject to the satisfaction of any liquidation preference granted to the holders of any then outstanding shares of preferred stock.

Other Rights and Preferences. The holders of the common stock have no preemptive, conversion or subscription rights, and there are no redemption or sinking fund provisions applicable to the common stock. The rights, preferences and privileges of the holders of the common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of our preferred stock that we may designate and issue in the future.

Fully Paid and Nonassessable. All of our outstanding shares of common stock are fully paid and nonassessable.

Preferred Stock

Our Board of Directors has the authority, without action by our stockholders, to designate and issue up to 10,000,000 shares of preferred stock in one or more series or classes and to designate the rights, preferences and privileges of each series or class, which may be greater than the rights of our common stock, of which (i) 120,000 shares had been designated as Series A Preferred Stock, none of which is outstanding, and (ii) 10,000,000 shares that have been designated as Series B Preferred Stock, none of which is outstanding. It is not possible to state the actual effect of the issuance of any shares of preferred stock upon the rights of holders of our common stock until our Board of Directors determines the specific rights of the holders of the preferred stock however, the effects might include:

- restricting dividends on our common stock;
- diluting the voting power of our common stock;
- impairing liquidation rights of our common stock; or
- delaying or preventing a change in control of us without further action by our stockholders.

The Board of Directors' authority to issue preferred stock without stockholder approval could make it more difficult for a third-party to acquire control of our company, and could discourage such attempt. We have no present plans to issue any additional shares of preferred stock.

Options

As of October 21, 2021, options to purchase an aggregate of 3,997,418 shares of common stock were outstanding under our equity incentive plans.

Anti-Takeover Effects of Certain Provisions of our Articles of Incorporation and Bylaws

Our Articles of Incorporation and Bylaws contain certain provisions that may have anti-takeover effects, making it more difficult for or preventing a third party from acquiring control of the Registrant or changing our board of directors and management. According to our Articles of Incorporation and Bylaws, the holders of the common stock do not have cumulative voting rights in the election of our directors. The lack of cumulative voting makes it more difficult for other stockholders to replace our board of directors or for a third party to obtain control of our company by replacing its Board of Directors.

Authorized but Unissued Shares

Our authorized but unissued shares of common stock will be available for future issuance without stockholder approval. We may use additional shares of common stock for a variety of purposes, including future public offerings to raise additional capital, to fund acquisitions and as employee compensation. The existence of authorized but unissued shares of common stock could render more difficult or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

Anti-Takeover Effects of Nevada Law

Business Combinations

The "business combination" provisions of Sections 78.411 to 78.444, inclusive, of the Nevada Revised Statutes ("NRS") generally prohibit a Nevada corporation with at least 200 stockholders from engaging in various "combination" transactions with any interested stockholder for a period of two years after the date of the transaction in which the person became an interested stockholder, unless the transaction is approved by the board of directors prior to the date the interested stockholder obtained such status or the combination is approved by the board of directors and thereafter is approved at a meeting of the stockholders by the affirmative vote of stockholders representing at least 60% of the outstanding voting power held by disinterested stockholders, and extends beyond the expiration of the two-year period, unless:

the combination was approved by the board of directors prior to the person becoming an interested stockholder or the transaction by which the person first became an interested stockholder was approved by the board of directors before the person became an interested stockholder or the combination is later approved by a majority of the voting power held by disinterested stockholders; or

if the consideration to be paid by the interested stockholder is at least equal to the highest of: (a) the highest price per share paid by the interested stockholder within the two years immediately preceding the date of the announcement of the combination or in the transaction in which it became an interested stockholder, whichever is higher, (b) the market value per share of common stock on the date of announcement of the combination and the date the interested stockholder acquired the shares, whichever is higher, or (c) for holders of preferred stock, the highest liquidation value of the preferred stock, if it is higher.

A “combination” is generally defined to include mergers or consolidations or any sale, lease exchange, mortgage, pledge, transfer, or other disposition, in one transaction or a series of transactions, with an “interested stockholder” having: (a) an aggregate market value equal to 5% or more of the aggregate market value of the assets of the corporation, (b) an aggregate market value equal to 5% or more of the aggregate market value of all outstanding shares of the corporation, (c) 10% or more of the earning power or net income of the corporation, and (d) certain other transactions with an interested stockholder or an affiliate or associate of an interested stockholder.

In general, an “interested stockholder” is a person who, together with affiliates and associates, owns (or within two years, did own) 10% or more of a corporation’s voting stock. The statute could prohibit or delay mergers or other takeover or change in control attempts and, accordingly, may discourage attempts to acquire our company even though such a transaction may offer our stockholders the opportunity to sell their stock at a price above the prevailing market price.

Control Share Acquisitions

The “control share” provisions of Sections 78.378 to 78.3793, inclusive, of the Nevada Revised Statutes apply to “issuing corporations” that are Nevada corporations with at least 200 stockholders, including at least 100 stockholders of record who are Nevada residents, and that conduct business directly or indirectly in Nevada. The control share statute prohibits an acquirer, under certain circumstances, from voting its shares of a target corporation’s stock after crossing certain ownership threshold percentages, unless the acquirer obtains approval of the target corporation’s disinterested stockholders. The statute specifies three thresholds: one-fifth or more but less than one-third, one-third but less than a majority, and a majority or more, of the outstanding voting power. Generally, once an acquirer crosses one of the above thresholds, those shares in an offer or acquisition and acquired within 90 days thereof become “control shares” and such control shares are deprived of the right to vote until disinterested stockholders restore the right. These provisions also provide that if control shares are accorded full voting rights and the acquiring person has acquired a majority or more of all voting power, all other stockholders who do not vote in favor of authorizing voting rights to the control shares are entitled to demand payment for the fair value of their shares in accordance with statutory procedures established for dissenters’ rights.

A corporation may elect to not be governed by, or “opt out” of, the control share provisions by making an election in its articles of incorporation or bylaws, provided that the opt-out election must be in place on the 10th day following the date an acquiring person has acquired a controlling interest, that is, crossing any of the three thresholds described above. We have not opted out of the control share statutes, and will be subject to these statutes if we are an “issuing corporation” as defined in such statutes.

The effect of the Nevada control share statutes is that the acquiring person, and those acting in association with the acquiring person, will obtain only such voting rights in the control shares as are conferred by a resolution of the stockholders at an annual or special meeting. The Nevada control share law, if applicable, could have the effect of discouraging takeovers of our company.

Transfer Agent and Registrar

The transfer agent and registrar for the common stock is Equiniti Trust Company (formerly known as Corporate Stock Transfer, Inc.). The transfer agent’s address is 3200 Cherry Creek Drive South, Suite 430, Denver, Colorado 80209, telephone number (303) 282-4800.

Listing on the NYSE American

Our common stock is listed on the NYSE American under the symbol “SYN.”

DESCRIPTION OF WARRANTS

Warrants

The following summary of the October 2018 Warrants is not complete and is subject to, and qualified in its entirety by, the provisions of the forms of warrant and warrant agency agreement, the form of which is filed as an exhibit to the registration statement of which this prospectus forms a part. Prospective investors should carefully review the terms and provisions of the form of warrant agent agreement for a complete description of the terms and conditions of the common warrants.

Warrants

As of October 21, 2021, we had issued and outstanding a total of 6,344,966 warrants to purchase our common stock outstanding at a weighted-average price of \$0.69.

Overview of October 2018 Warrants and the October 2018 Underwritten Public Offering

Overview. As stated above, the October 2018 Warrants are exercisable at a price of \$0.69 per share of common stock and expire on October 15, 2023..

Form. The October 2018 Warrants were issued in electronic book entry form. The form of warrant and the warrant agency agreement are each filed as an exhibit to the registration statement of which this prospectus forms a part.

Exercisability. The October 2018 Warrants are exercisable at any time after their original issuance and will expire on the fifth anniversary of the original issuance date. The October 2018 Warrants will be exercisable, at the option of each holder, in whole or in part by delivering to us a duly executed exercise notice and by payment in full in immediately available funds for the number of shares of common stock purchased upon such exercise. If at the time of exercise, there is no effective registration statement registering, or no current prospectus available for, the issuance of the shares of common stock to the holder, then the common warrant may only be exercised through a cashless exercise, in which case the holder would receive upon such exercise the net number of shares of common stock determined according to the formula set forth in the warrant. No fractional shares of common stock will be issued in connection with the exercise of a warrant. In lieu of fractional shares, we will pay the holder an amount in cash equal to the fractional amount multiplied by the fair market value of any such fractional shares.

Exercise Limitations. Under the October 2018 Warrants, we may not effect the exercise of any warrant, and a holder will not be entitled to exercise any portion of any warrant, which, upon giving effect to such exercise, would cause (i) the aggregate number of shares of our common stock beneficially owned by the holder (together with its affiliates) to exceed [4.99%/9.99%] of the number of shares of our common stock outstanding immediately after giving effect to the exercise, or (ii) the combined voting power of our securities beneficially owned by the holder (together with its affiliates) to exceed [4.99%/9.99%] of the combined voting power of all of our securities then outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the October 2018 Warrants. However, any holder may increase or decrease such percentage to any other percentage not in excess of 9.99% upon at least 61 days' prior notice from the holder to us.

Exercise Price. The exercise price per whole share of our common stock purchasable upon the exercise of the October 2018 Warrants is \$0.69 and may be adjusted in the event of certain stock dividends and distributions, stock splits, stock combinations, reclassifications or similar events affecting our common stock and also upon any distributions of assets, including cash, stock or other property to our stockholders. Subject to certain exceptions, the October 2018 Warrants provide for adjustment of the exercise price if we or any of our subsidiaries, as applicable, sell or grant any right to reprice, or otherwise dispose of or issue (or announce any offer, sale, grant or any option to purchase or other disposition) any shares of our common stock or common stock equivalents, at an effective price per share that is less than the exercise price then in effect (such lower price, the "Base Share Price" and such issuances collectively, a "Dilutive Issuance"). In the event a Dilutive Issuance occurs, the exercise price shall be reduced to equal the Base Share Price.

On November 16, 2020, the exercise price of the October 2018 Warrants was reduced from \$1.38 per warrant per full share of our common stock to \$0.69 per October 2018 Warrant per full share of common stock in accordance with the anti-dilution terms of the October 2018 Warrants.

Transferability. Subject to applicable laws, the October 2018 Warrants may be offered for sale, sold, transferred or assigned without our consent.

Exchange Listing. We have not applied and do not plan on applying to list the October 2018 Warrants on the NYSE American, any other national securities exchange or any other nationally recognized trading system.

13

Fundamental Transactions. In the event of a fundamental transaction, as described in the October 2018 Warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of more than 50% of our outstanding common stock, or any person or group becoming the beneficial owner of 50% of the voting power represented by our outstanding common stock, the holders of the common warrants will be entitled to receive upon exercise of the October 2018 Warrants the kind and amount of securities, cash or other property that the holders would have received had they exercised the October 2018 Warrants immediately prior to such fundamental transaction without regard to any limitations on exercise contained in the October 2018 Warrants. In the event of a fundamental transaction, we are required to cause any successor entity to assume all of our obligations under the October 2018 Warrants.

Right as a Stockholder. Except by virtue of such holder's ownership of shares of our common stock, the holder of a warrant does not have the rights or privileges of a holder of our common stock, including any voting rights, until the holder exercises the warrant.

14

PLAN OF DISTRIBUTION

The common stock referenced on the cover page of this prospectus will be offered solely by us and will be issued and sold upon the exercise of the outstanding October 2018 Warrants issued in 2018 described herein. We will deliver shares of our common stock upon exercise of the October 2018 Warrants; however, no fractional shares will be issued. The October 2018 Warrants are exercisable for a total of 6,344,966 shares of our common stock (subject to adjustment), and no more of these October 2018 Warrants will be issued by us. Each of these October 2018 Warrants contains instructions for exercise. In order to exercise any of these Warrants, the holder must deliver to us or our transfer agent the information required in the October 2018 Warrants, along with payment for the exercise price of the shares of common stock to be purchased. If, however, we are unable to offer and sell the shares underlying the October 2018 Warrants pursuant to this prospectus due to the ineffectiveness of the registration statement of which this prospectus is a part, then the October 2018 Warrants may be exercised on a "net" or "cashless" basis.

15

LEGAL MATTERS

The validity of the issuance of the securities offered hereby has been passed upon for us by Parsons Behle & Latimer, Reno, Nevada.

EXPERTS

The consolidated financial statements as of December 31, 2020 and 2019, and for each of the two years in the period ended December 31, 2020, incorporated by reference in this Prospectus and the Registration statement have been so incorporated in reliance on the report of BDO USA, LLP, an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus is part of a registration statement we filed with the SEC. This prospectus does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities we are offering under this prospectus, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. Neither we nor any agent, underwriter or dealer has authorized any person to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front page of this prospectus, regardless of the time of delivery of this prospectus or any sale of the securities offered by this prospectus.

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public at the SEC's website at www.sec.gov. Additional information about Synthetic Biologics, Inc. is contained at our website, www.syntheticbiologics.com. Information on our website is not incorporated by reference into this prospectus. We make available on our website our SEC filings as soon as reasonably practicable after those reports are filed with the SEC. The following

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to “incorporate by reference” the information we file with it which means that we can disclose important information to you by referring you to those documents instead of having to repeat the information in this prospectus. The information incorporated by reference is considered to be part of this prospectus, and later information that we file with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings made with the SEC (other than any portions of any such documents that are not deemed “filed” under the Exchange Act in accordance with the Exchange Act and applicable SEC rules) under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after (i) the date of the initial registration statement and prior to the effectiveness of the registration statement, and (ii) the date of this prospectus and before the completion of the offerings of the shares of our common stock included in this prospectus.

- [Our Annual Report on Form 10-K for the fiscal year ended December 31, 2020 filed with the SEC on March 4, 2021 \(File No. 001-12584\);](#)
- [Our Quarter Report on Form 10-Q for the quarter ended March 31, 2021 filed with the SEC on May 5, 2021 \(File No. 001-12584\);](#)
- [Our Quarter Report on Form 10-Q for the quarter ended June 30, 2021 filed with the SEC on August 5, 2021 \(File No. 001-12584\);](#)
- Our Current Reports on Form 8-K and Form 8-K/A (File No. 001-12584) filed with the SEC on [January 6, 2021](#), [January 19, 2021](#), [January 27, 2021](#), [January 29, 2021](#), [February 1, 2021](#), [February 4, 2021](#), [February 8, 2021](#), [February 10, 2021](#), [February 12, 2021](#), [February 19, 2021](#), [April 1, 2021](#) (other than as indicated therein), [April 14, 2021](#) (other than as indicated therein), [May 3, 2021](#), [May 26, 2021](#) and [June 29, 2021](#) (other than as indicated therein), [September 21, 2021](#), [October 6, 2021](#) and [October 14, 2021](#);
- [Our revised definitive proxy statement on Schedule 14A filed with the SEC on August 17, 2021 \(File No. 001-12584\);](#)and
- The description of our common stock set forth in our registration statement or [Form 8-A12B, filed with the SEC on June 20, 2007 \(File No. 000-12584\)](#), as updated by the description of our common stock filed as [Exhibit 4.7 to our Annual Report on Form 10-K for the year ended December 31, 2020 filed with the SEC on March 4, 2021](#), including any amendments or reports filed for the purpose of updating such description.

16

Any statement contained in this prospectus or in a document incorporated or deemed to be incorporated by reference into this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or any other subsequently filed document that is deemed to be incorporated by reference into this prospectus modifies or supersedes the statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

We will furnish without charge to you, on written or oral request, a copy of any or all of the documents that are incorporated by reference into this prospectus and the documents we file with the SEC that are incorporated by reference herein, but not delivered with the prospectus, including exhibits which are specifically incorporated by reference into such documents. You should direct any requests for documents to Synthetic Biologics, Inc., Attn: Steven A. Shallcross, Chief Executive Officer and Chief Financial Officer, 9605 Medical Center Drive, Suite 270, Rockville, Maryland 20850, or telephoning us at (301) 417-4364.

You should rely only on information contained in, or incorporated by reference into, this prospectus and the documents we file with the SEC that are incorporated by reference herein. We have not authorized anyone to provide you with information different from that contained in this prospectus or incorporated by reference in this prospectus. We are not making offers to sell the securities in any jurisdiction in which such an offer or solicitation is not authorized or in which the person making such offer or solicitation is not qualified to do so or to anyone to whom it is unlawful to make such offer or solicitation.

17

**6,344,966 Shares of common stock Issuable Upon
Exercise of Outstanding Warrants**



PROSPECTUS

November 2, 2021
