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Filed Pursuant to Rule 424(b)(5)
Registration No. 333-209077

PROSPECTUS SUPPLEMENT
(to Prospectus dated February 9, 2016)

1,474,080 Shares of Common Stock

We are offering 1,474,080 shares of our common stock, $0.001 par value per share, at a purchase price of $2.69 per share, to certain institutional and accredited investors pursuant to this prospectus supplement and the accompanying prospectus and securities purchase agreements with such investors. In a concurrent private placement, we are also selling to such investors warrants to purchase up to 958,152 shares of our common stock, which represent 65% of the number of shares of our common stock being purchased in this offering (the "Warrants"). The Warrants and the shares of our common stock issuable upon the exercise of the Warrants (the "Warrant Shares") are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act of 1933, as amended (the "Securities Act") and Rule 506(b) promulgated thereunder, and they are not being offered pursuant to this prospectus supplement and the accompanying prospectus. The Warrants being issued in the concurrent private placement are not listed on any securities exchange, and we do not expect to list the Warrants.

Our common stock is listed on the Nasdaq Capital Market and traded under the symbol "FCSC." The last reported sale price of our common stock on the Nasdaq Capital Market on June 29, 2018 was $2.705 per share.

As of July 2, 2018, the aggregate market value of the outstanding common stock held by non-affiliates, computed by reference to the price at which our common stock was last sold on May 17, 2018, was $29,691,687, based on 7,840,905 shares of our outstanding common stock as of June 29, 2018, of which 6,185,687 shares were held by non-affiliates. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our public float remains below $75.0 million. During the 12 calendar months prior to and including the date of this prospectus (excluding this offering), we sold an aggregate of $5,808,938 of securities pursuant to General Instruction I.B.6 of Form S-3.

See "Risk Factors" beginning on page S-4 of this prospectus supplement and in our other filings with the Securities and Exchange Commission incorporated by reference in this prospectus supplement and the accompanying prospectus to read about factors you should consider before making a decision to invest in our common stock.

We have retained H.C. Wainwright & Co., LLC ("Wainwright") to act as our exclusive placement agent in connection with the shares of common stock offered by this prospectus supplement and the accompanying prospectus. The placement agent has agreed to use its reasonable best efforts to sell the shares of common stock offered by this prospectus supplement and the accompanying prospectus. We have agreed to pay the placement agent the placement agent fees set forth in the table below, which assumes that we sell all of the shares of common stock we are offering.

	Per Share	Total
Offering Price	$ 2.69	$ 3,965,275.20
Placement Agent Fees(1)(2)	$ 0.1883	$ 277,569.26
Proceeds, before expenses, to us(2)	$ 2.5017	$ 3,687,705.94

(1) We have agreed to reimburse the placement agent for certain of its expenses and to grant warrants to purchase shares of our common stock to the placement agent as described under the "Plan of Distribution" on page S-11 of this prospectus supplement (the "Placement Agent Warrants").
(2) The amount of the offering proceeds to us presented in this table does not give effect to the sale or exercise, if any, of the Warrants being issued in the concurrent private placement or of the Placement Agent Warrants.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.

We anticipate delivery of the shares will take place on or about July 5, 2018, subject to the satisfaction of certain closing conditions.

H.C. Wainwright & Co.

The date of this prospectus supplement is July 2, 2018.

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus are part of a "shelf" registration statement on Form S-3 (File No. 333-209077) that we initially filed with the Securities and Exchange Commission (the "SEC") on January 21, 2016, and that was declared effective by the SEC on February 9, 2016. This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering and adds to and updates the information contained in the accompanying prospectus. The second part, the accompanying prospectus, provides more general information, some of which may not apply to this offering. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. To the extent there is a conflict between the information contained in this prospectus supplement and the information contained in the accompanying prospectus or in any document incorporated by reference into this prospectus supplement that was filed with the SEC before the date of this prospectus supplement, you should rely on the information in this prospectus supplement.

This prospectus supplement and the accompanying prospectus relate to this offering. Before buying any of the shares of common stock offered hereby, we urge you to read carefully this prospectus supplement and the accompanying prospectus, together with the information incorporated herein and therein by reference as described below under the section entitled "Incorporation of Certain Information by Reference" on page S-14 of this prospectus supplement.

You should rely only on the information contained in, or incorporated by reference into, this prospectus supplement and the accompanying prospectus. We have not, and the placement agent has not, authorized anyone to provide you with different or additional information.

We are not, and the placement agent is not, making offers to sell or solicitations to buy our shares of common stock in any jurisdiction in which an offer or solicitation is not authorized or in which the person making that offer or solicitation is not qualified to do so or to anyone to whom it is unlawful to make an offer or solicitation. Persons outside the United States who come into possession of this prospectus supplement and accompanying prospectus must inform themselves about, and observe any restrictions relating to, the offering of our shares of common stock and the distribution of this prospectus supplement and accompanying prospectus outside the United States. You should assume that the information in this prospectus supplement and the accompanying prospectus is accurate only as of the date on the front of the respective document and that any information that 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 supplement or the accompanying prospectus or the time of any sale of a security.

This prospectus supplement and the accompanying prospectus contain summaries of certain provisions contained in some of the documents described herein and therein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein and therein have been filed, will be filed or will be incorporated herein by reference as exhibits to the registration statement, and you may obtain copies of those documents as described below under the section entitled "Where You Can Find More Information" on page S-14 of this prospectus supplement.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is incorporated by reference herein were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

This prospectus supplement and the accompanying prospectus contain and incorporate by reference market data and industry statistics and forecasts that are based on independent industry publications and other publicly-available information. Although we believe these sources are reliable, we do not guarantee the accuracy or completeness of this information and we have not independently verified this information. Although we are not aware of any misstatements regarding the market data and industry statistics and forecasts presented in this prospectus supplement, accompanying prospectus or the documents incorporated herein and therein by reference, these estimates involve risks and uncertainties and are subject to change based on various factors. Accordingly, investors should not place undue reliance on this information.

On May 24, 2018, we amended our certificate of incorporation to effect a one-for-five reverse split of our outstanding shares of our common stock. All share and per share data in this prospectus supplement gives effect to the reverse stock split.

Unless the context otherwise requires, in this prospectus supplement the "Company," "Fibrocell," "we," "us," "our" and similar names refer to Fibrocell Science, Inc. and its subsidiaries.

This prospectus supplement and the accompanying prospectus and the information incorporated herein and therein by reference include trademarks, service marks and trade names owned by us or other companies. We have registered or filed applications to register certain trademarks in the United States and abroad, including Fibrocell®, Fibrocell Science® and LAVIV®. All other trademarks or trade names referred to in this prospectus supplement and the accompanying prospectus are the property of their respective owners.

PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights selected information about us and this offering and does not contain all of the information that you should consider in making your investment decision. You should carefully read this entire prospectus supplement and the accompanying prospectus, including the risks and uncertainties discussed under the heading "Risk Factors" beginning on page S-4 of this prospectus supplement, and the information incorporated by reference in this prospectus supplement, including our financial statements, before making an investment decision. If you invest in our shares of common stock, you are assuming a high degree of risk.

Company Overview

We are an autologous cell and gene therapy company focused on translating personalized biologics into medical breakthroughs for diseases affecting the skin and connective tissue. Our distinctive approach to personalized biologics is based on our proprietary autologous fibroblast technology. Fibroblasts are the most common cell in skin and connective tissue and are responsible for synthesizing extracellular matrix proteins, including collagen and other growth factors, that provide structure and support. Because fibroblasts naturally reside in the localized environment of the skin and connective tissue, they represent an ideal delivery vehicle for proteins targeted to these areas. We target the underlying cause of disease by using fibroblast cells from a patient's skin and genetically modifying them to create localized therapies that are compatible with the unique biology of the patient (i.e., which are autologous).

We are focused on discovering and developing localized therapies for diseases affecting the skin and connective tissue, where there are high unmet needs, to improve the lives of patients and their families. In that regard, we commit significant resources to our research and development programs. Currently, all of our research and development operations and focus are on gaining regulatory approvals to commercialize our product candidates in the United States; however, we may seek to expand into international markets in the future.

For more information about our Company, please refer to other documents that we have filed with the SEC and that are incorporated by reference into this prospectus, as listed under the heading "Incorporation of Certain Information by Reference."

Corporate Information

Our corporate headquarters is located at 405 Eagleview Boulevard, Exton, Pennsylvania 19341. Our phone number is (484) 713-6000. Our corporate website is www.fibrocell.com. We make available free of charge on our website our annual, quarterly and current reports, including amendments to such reports, as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the SEC. Information contained on our website is not incorporated by reference into this prospectus supplement or the accompanying prospectus, and you should not consider information contained on our website as part of this prospectus supplement or the accompanying prospectus.

THE OFFERING

Issuer	Fibrocell Science, Inc.
Common stock offered by us	1,474,080 shares of common stock.
Offering price	$2.69 per share of common stock.
Common stock to be outstanding after this offering	9,314,985 shares.
Concurrent private placement of Warrants	We are offering 1,474,080 shares of our common stock in this offering pursuant to this prospectus supplement and the accompanying base prospectus and securities purchase agreements at a price of $2.69 per share. In a concurrent private placement, we are also selling to investors, at a purchase price of $0.125 per underlying share, Warrants to purchase an additional 958,152 shares of our common stock which represent 65% of the number of shares of our common stock purchased in this offering. Each Warrant will be exercisable for one share of our common stock at an exercise price of $2.70 per share. The Warrants and the Warrant Shares are not being registered under the Securities Act, pursuant to the registration statement of which this prospectus supplement and the accompanying base prospectus form a part nor are such Warrants and Warrant Shares being offered pursuant to such prospectus supplement and base prospectus and are being offered pursuant to an exemption provided in Section 4(a)(2) of the Securities Act and Rule 506(b) promulgated thereunder. The Warrants are not and will not be listed for trading on any national securities exchange. Each purchaser will be an "accredited investor" as such term is defined in Rule 501(a) under the Securities Act.
Use of Proceeds	We estimate that the net proceeds from the sale of our shares of common stock in this offering will be approximately $3.5 million, after deducting the placement agent fees and estimated offering expenses payable by us and excluding any proceeds we may receive upon the sale or exercise of the Warrants being offered in the concurrent private placement. We currently intend to use the net proceeds from this offering for the continued clinical and pre-clinical development of our product candidates, FCX-007 and FCX-013, and for other general corporate purposes, which may include working capital, research and development expenditures, the funding of in-licensing agreements for product candidates, additional technologies or other forms of intellectual property, expenditures relating to manufacturing infrastructure and other capital

	expenditures and general and administrative expenses. See "Use of Proceeds" on page S-8.
Risk Factors	Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page S-4 of this prospectus supplement and page 3 of the accompanying prospectus, as well as the risk factors sections of any documents incorporated by reference into this prospectus supplement.
Market for our Common Stock	Our common stock is listed and traded on Nasdaq Capital Market under the symbol "FCSC."

The number of shares of our common stock to be outstanding immediately after this offering is based on 5,672,976 shares of our common stock outstanding as of March 31, 2018, plus (i) 2,038,224 shares of our common stock issued in a registered direct public offering in May 2018 (the "May 2018 Registered Direct Public Offering"), and (ii) 129,705 shares of common stock issued upon the exercise of certain of our previously issued warrants subsequent to March 31, 2018. Unless specifically stated otherwise, the information in this prospectus supplement is as of March 31, 2018 and excludes:

- 1,123,971 shares of our common stock issuable upon the conversion of our outstanding convertible promissory notes, including accrued interest thereon, payable in shares of our common stock, outstanding as of March 31, 2018;
- 720,000 shares of our common stock issuable upon the conversion of our Series A Convertible Preferred Stock, par value $0.001 per share, or the Series A Preferred Stock, including accrued dividends thereon, payable in shares of our common stock, outstanding as of March 31, 2018;
- 266,561 shares of our common stock issuable upon the exercise of stock options outstanding as of March 31, 2018, at a weighted average exercise price of $49.90 per share, of which stock options to purchase 143,413 shares of our common stock were then exercisable;
- 4,969,692 shares of our common stock issuable upon the exercise of warrants outstanding as of March 31, 2018 at a weighted average exercise price of $12.41 per share, all of which warrants were then exercisable;
- an aggregate of 235,845 shares of our common stock reserved for future grants of stock options (or other similar equity instruments) under the Fibrocell Science, Inc. 2009 Equity Incentive Plan, as amended (the "Equity Incentive Plan"), as of March 31, 2018;
- 1,528,668 shares of our common stock issuable upon exercise warrants issued in a private placement transaction in May 2018 (the "May 2018 Private Placement"), with an exercise price of $2.86 per share;
- 142,676 shares of our common stock issuable upon exercise of the warrants issued to the designees of Wainwright as partial consideration for Wainwright's placement agent services in connection with the 2018 Registered Direct Public Offering and the 2018 Private Placement, with an exercise price of 3.679 per share;
- 103,186 shares of our common stock issuable upon the exercise of the Placement Agent Warrants, with an exercise price of $3.464 per share; and
- 958,152 Warrant Shares issuable upon the exercise of the Warrants to be offered in the concurrent private placement, with an exercise price of $2.70 per share.

Except as otherwise indicated herein, all information in this prospectus supplement, including the number of shares that will be outstanding after this offering, does not assume or give effect to the exercise of options or warrants outstanding as of March 31, 2018 or to the exercise of the Warrants offered in the concurrent private placement or to the Placement Agent Warrants.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before investing in our common stock, you should carefully consider the risks described below, together with all of the other information contained in this prospectus supplement and the accompanying prospectus and incorporated by reference herein and therein, including from our most recent Annual Report on Form 10-K and subsequent Quarterly Reports on Form 10-Q. Some of these factors relate principally to our business and the industry in which we operate. Other factors relate principally to your investment in our common stock. The risks and uncertainties described therein and below are not the only risks facing us. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also materially and adversely affect our business and operations.

If any of the matters included in the following risks were to occur, our business, financial condition, results of operations, cash flows or prospects could be materially and adversely affected. In such case, you may lose all or part of your investment.

Risks Related to Our Securities and this Offering

We have a significant number of outstanding convertible notes, convertible preferred stock, warrants and stock options, and future sales of the underlying shares of common stock could adversely affect the market price of our common stock.

As of March 31, 2018, we had outstanding convertible notes convertible for 1,123,971 shares of our common stock (including accrued interest thereon), outstanding convertible preferred stock convertible for 720,000 shares of our common stock (including accrued interest thereon), outstanding warrants exercisable for 4,969,692 shares of our common stock at a weighted average exercise price of $12.41 per share, all of which warrants were then exercisable, and outstanding stock options exercisable for 266,561 shares of our common stock at a weighted average exercise price of $49.90 per share, of which stock options to purchase 143,413 shares of our common stock were then exercisable. In connection with the May 2018 Private Placement, we also issued (i) warrants exercisable for 1,528,668 shares of our comment stock at an exercise price of $2.86 to certain accredited investors and (ii) warrants exercisable for 142,676 shares of our common stock at an exercise price of $3.679 to certain designees of Wainwright, in each case, all of which were immediately exercisable. Upon conversion of these notes or preferred stock or exercise of these warrants or stock options, we would issue additional shares of our common stock. As a result, our current stockholders as a group would own a substantially smaller interest in us and may have less influence on our management and policies than they now have. Furthermore, the holders may sell these shares in the public markets from time to time, without limitations on the timing, amount or method of sale. As our stock price rises, the holders may convert more of their notes or preferred stock or exercise more of their warrants or stock options and sell a large number of shares. This could cause the market price of our common stock to decline.

We may be required to raise additional financing by issuing new securities with terms or rights superior to those of our existing securityholders, which could adversely affect the market price of shares of our common stock and our business

We will require additional financing to fund future operations, including our research and development activities. We may not be able to obtain financing on favorable terms, if at all. If we raise additional funds by issuing equity securities, the percentage ownership of our current stockholders will be reduced, and the holders of the new equity securities may have rights superior to those of our existing securityholders, which could adversely affect the market price of our common stock and the voting power of shares of our common stock. If we raise additional funds by issuing debt securities, the holders of these debt securities would similarly have some rights senior to those of our existing securityholders, and the terms of these debt securities could impose restrictions on operations and create a significant interest expense for us which could have a materially adverse effect on our business.

We have broad discretion in the use of the net proceeds of this offering and, despite our efforts, we may use the net proceeds in a manner that does not increase the value of your investment.

We currently intend to use the net proceeds from this offering for the continued clinical and pre-clinical development of our product candidates, FCX-007 and FCX-013, and for other general corporate purposes, which may include working capital, research and development expenditures, the funding of in-licensing agreements for product candidates, additional technologies or other forms of intellectual property, expenditures relating to manufacturing infrastructure and other capital expenditures and general and administrative expenses. However, we have not determined the specific allocation of the net proceeds among these potential uses. Our management will have broad discretion over the use and investment of the net proceeds of this offering, and, accordingly, investors in this offering will need to rely upon the judgment of our management with respect to the use of proceeds, with only limited information concerning our specific intentions. These proceeds could be applied in ways that do not improve our operating results or increase the value of your investment. Please see the section entitled "Use of Proceeds" on page S-8 of this prospectus supplement for further information.

You will experience immediate and substantial dilution in the net tangible book value per share of the common stock you purchase.

The offering price per share of our common stock being offered is substantially higher than the net tangible book value per share of our outstanding common stock. As a result, the investor purchasing shares of our common stock in this offering will incur immediate dilution of $1.03 per share, after giving effect to the sale of an aggregate of 1,474,080 shares of our common stock at an offering price of $2.69 per share, and after deducting placement agent fees and estimated offering expenses payable by us. The immediate dilution of $1.03 per share is impacted by (i) an increase in net tangible book value per share related to (a) the issuance of 2,038,224 shares of our common stock in the May 2018 Registered Direct Public Offering and (b) the subsequent exercise of certain of our outstanding warrants subsequent to March 31, 2018 through June 29, 2018 and (ii) an increase in net tangible book value per share related to this offering. See "Dilution" on page S-9 of this prospectus supplement for a more detailed discussion of the dilution you will incur if you purchase shares in this offering.

A substantial number of shares of our common stock may be sold in this offering, which could cause the price of our common stock to decline.

In this offering we are selling 1,474,080 shares of common stock, which represents approximately 15.8% of our outstanding common stock as of July 2, 2018 after giving effect to the sale of the shares of our common stock in this offering. In addition, the investors in this offering will receive, pursuant to the concurrent private placement, unregistered Warrants to purchase up to 958,152 shares of our common stock which represent 65% of the number of shares of our common stock purchased in this offering. This sale and any future sales of a substantial number of shares of our common stock in the public market, or the perception that such sales may occur, could adversely affect the price of our common stock on the Nasdaq Capital Market. We cannot predict the effect, if any, that market sales of those shares of our common stock or the availability of those shares of our common stock for sale will have on the market price of our common stock.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein contain forward-looking statements that involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management are forward-looking statements. The words "aim," "anticipate," "believe," "estimate," "expect," "potential," "intend," "may," "plan," "predict," "project," "will," "should," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

The forward-looking statements in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein include, among other things, statements about:

- our expectations related to the use of proceeds from this offering;
- our expectation that our existing cash resources, plus the net proceeds of this offering and the concurrent private placement, will be sufficient to enable us to fund our operations into the fourth quarter of 2019;
- our review of strategic alternatives, including the possible sale or merger of our company;
- future expenses and capital expenditures;
- our estimates regarding expenses, future revenues, capital requirements and needs for, and ability to obtain, additional financing;
- our plans to address our future capital requirements and the consequences of failing to do so;
- our need to raise substantial additional capital to fund our operations;
- our expectation to complete enrollment of patients in the Phase 2 portion of our Phase 1/2 clinical trial of FCX-007 in the third quarter of 2018;
- our plans to report interim data from patients from the Phase 2 portion of our Phase 1/2 clinical trial for FCX-007 and provide a trial update in the first quarter of 2019;
- our plans to use the existing data from the Phase 1 portion of the Phase 1/2 clinical trial of FCX-007 to support a petition for Regenerative Medicine Advanced Therapy or Breakthrough Therapy Designation for FCX-007;
- our expectation to initiate enrollment in a Phase 1/2 clinical trial of FCX-013 in the third quarter of 2018;
- our product development goals under our collaborations with Precigen, Inc., a wholly-owned subsidiary of Intrexon Corporation, for our product candidates;
- the potential benefits of Fast Track, Orphan Drug and Rare Pediatric Disease designations;
- the potential advantages of our product candidates and technologies; and
- the effect of legal and regulatory developments.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this prospectus supplement, particularly under "Risk Factors" on page S-4 of this prospectus supplement, the accompanying prospectus and the documents incorporated herein and therein that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures, collaborations or investments we may make.

You should read this prospectus supplement, the accompanying prospectus and the documents that we incorporate by reference herein and therein completely and with the understanding that our actual future results may be materially different from what we expect.

Except as required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. You should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements. Before deciding to purchase our securities, you should carefully consider the risk factors discussed and incorporated by reference in this prospectus supplement and the accompanying prospectus and in the registration statement of which this prospectus supplement and the accompanying prospectus form a part.

USE OF PROCEEDS

We estimate that the proceeds from this offering will be approximately $3.5 million, after deducting the placement agent fees and estimated offering expenses payable by us and excluding any proceeds we may receive upon the sale or exercise of the Warrants being offered in the concurrent private placement or the Placement Agent Warrants.

As of March 31, 2018, we had cash and cash equivalents of $12.2 million. We currently intend to use the net proceeds from this offering for the continued clinical and pre-clinical development of our product candidates, FCX-007 and FCX-013, and for other general corporate purposes, which may include working capital, research and development expenditures, the funding of in-licensing agreements for product candidates, additional technologies or other forms of intellectual property, expenditures relating to manufacturing infrastructure and other capital expenditures and general and administrative expenses.

This expected use of net proceeds from this offering and our existing cash and cash equivalents represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. The amounts and timing of our use of the net proceeds from this offering will depend on a number of factors, such as the timing and progress of our research and development efforts, the timing and progress of any partnering efforts, technological advances and the competitive environment for our product candidates. As of the date of this prospectus supplement, we cannot specify with certainty all of the particular uses for the net proceeds to us from the sale of the shares of common stock offered by us hereunder. Accordingly, our management will have broad discretion in the timing and application of these proceeds. Pending application of the net proceeds as described above, we intend to temporarily invest the proceeds in short-term, interest-bearing instruments.

Although it is difficult to predict future liquidity requirements, we believe that the net proceeds from this offering, together with our existing cash resources, will be sufficient to enable us to fund our operations into the fourth quarter of 2019. We have based this estimate on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently expect.

DILUTION

Our net tangible book value as of March 31, 2018, was approximately $6.3 million, or $1.10 per share of our common stock. Net tangible book value per share of our common stock is determined by dividing total tangible assets (less total tangible liabilities) by the aggregate number of shares of our common stock outstanding as of March 31, 2018.

Our pro forma net tangible book value as of March 31, 2018 was $12.0 million, or $1.53 per share of our common stock. Pro forma net tangible book value per share represents pro forma net tangible book value divided by the pro forma number of shares of common stock outstanding, after giving effect to (i) our issuance and sale in May 2018 of 2,038,224 shares of our common stock in the May 2018 Registered Direct Public Offering and (ii) the issuance of 129,705 shares of our common stock upon warrant exercises subsequent to March 31, 2018 through June 29, 2018, for total aggregate net proceeds of approximately $5.7 million. This assumes no exercise of any other common stock warrants or common stock options.

After giving effect to the assumed sale of 1,474,080 shares of common stock in this offering at a price of $2.69 per share, and after deducting estimated placement agent fees and other estimated offering expenses paid or payable by us, our pro forma as adjusted net tangible book value as of March 31, 2018 would have been approximately $15.5 million, or approximately $1.66 per share. This represents an immediate increase in net tangible book value of $0.13 per share to our existing stockholders and immediate dilution in net tangible book value of $1.03 per share to purchasers in this offering. The following table illustrates this calculation on a per share basis:

Offering price per share in this offering		$ 2.69
Net tangible book value per share as of March 31, 2018	$ 1.10	
Increase in pro forma tangible book value per share attributable to (i) sale of shares in the May 2018 Registered Direct Public Offering and (ii) exercise of warrants subsequent to March 31, 2018 through June 29, 2018	0.43	
Pro forma net tangible book value per share as of March 31, 2018	1.53	
Increase in pro forma as adjusted increase in net tangible book value per share attributable to purchasers in this offering	0.13	
Pro forma as adjusted net tangible book value per share immediately after this offering		1.66
Dilution per share to purchasers in this offering		1.03

Dilution per share to investors purchasing our common stock in this offering represents the difference between the price per share to be paid for the shares sold by us in this offering and the pro forma as adjusted net tangible book value per share after giving effect to (i) this offering, (ii) our issuance and sale in May 2018 of 2,038,224 shares of our common stock in the May 2018 Registered Direct Public Offering and (iii) our issuance of 129,705 shares of our common stock upon warrant exercises subsequent to March 31, 2018 through June 29, 2018.

The number of shares of our common stock to be outstanding immediately after this offering is based on 5,672,976 shares of our common stock outstanding as of March 31, 2018, plus (i) 2,038,224 shares of our common stock issued in a registered direct public offering in the May 2018 Registered Direct Public Offering, and (ii) 129,705 shares of common stock issued upon the exercise of certain of our previously issued warrants subsequent to March 31, 2018. Unless specifically stated otherwise, the information in this prospectus supplement is as of March 31, 2018 and excludes:

- 1,123,971 shares of our common stock issuable upon the conversion of our outstanding convertible promissory notes, including accrued interest thereon, payable in shares of our common stock, outstanding as of March 31, 2018;
- 720,000 shares of our common stock issuable upon the conversion of our Series A Convertible Preferred Stock, par value $0.001 per share, or the Series A Preferred Stock, including accrued dividends thereon, payable in shares of our common stock, outstanding as of March 31, 2018;
- 266,561 shares of our common stock issuable upon the exercise of stock options outstanding as of March 31, 2018, at a weighted average exercise price of $49.90 per share, of which stock options to purchase 143,413 shares of our common stock were then exercisable;
- 4,969,692 shares of our common stock issuable upon the exercise of warrants outstanding as of March 31, 2018 at a weighted average exercise price of $12.41 per share, all of which warrants were then exercisable;
- an aggregate of 235,845 shares of our common stock reserved for future grants of stock options (or other similar equity instruments) under the Equity Incentive Plan, as of March 31, 2018;
- 1,528,668 shares of our common stock issuable upon exercise warrants issued in the May 2018 Private Placement, with an exercise price of $2.86 per share;
- 142,676 shares of our common stock issuable upon exercise of the warrants issued to the designees of Wainwright as partial consideration for Wainwright's placement agent services in connection with the 2018 Registered Direct Public Offering and the 2018 Private Placement, with an exercise price of 3.679 per share;
- 103,186 shares of our common stock issuable upon the exercise of the Placement Agent Warrants, with an exercise price of $3.464 per share; and
- 958,152 Warrant Shares issuable upon the exercise of the Warrants to be offered in the concurrent private placement, with an exercise price of $2.70 per share.

The above illustration of dilution per share to investors participating in this offering assumes no exercise of options or warrants to purchase shares of our common stock, including the Warrants to be issued to the purchasers in this offering in the concurrent private placement or the Placement Agent Warrants (see "Private Placement of Warrants" for more information). The exercise of any such securities will increase dilution to purchasers in this offering.

Because there is no minimum offering amount required as a condition to the closing of this offering, the dilution per share to new investors may be more than that indicated above in the event that the actual number of shares sold, if any, is less than the maximum number of shares of common stock we are offering.

PLAN OF DISTRIBUTION

Pursuant to an engagement letter agreement dated May 25, 2018, we have engaged H.C. Wainwright & Co., LLC, ("Wainwright" or the "placement agent") to act as our exclusive placement agent in connection with this offering of our shares of common stock pursuant to this prospectus supplement and accompanying prospectus. Under the terms of the engagement letter, the placement agent has agreed to be our exclusive placement agent, on a reasonable best efforts basis, in connection with the issuance and sale by us of our shares of common stock in this takedown from our shelf registration statement. The terms of this offering were subject to market conditions and negotiations between us, the placement agent and prospective investors. The engagement letter does not give rise to any commitment by the placement agent to purchase any of our shares of common stock, and the placement agent will have no authority to bind us by virtue of the engagement letter. Further, the placement agent does not guarantee that it will be able to raise new capital in any prospective offering. The placement agent may engage sub-agents or selected dealers to assist with this offering.

The placement agent proposes to arrange for the sale of the shares we are offering pursuant to this prospectus supplement and accompanying prospectus to one or more investors through securities purchase agreements directly between the purchasers and us.

We expect to deliver the shares of our common stock being offered pursuant to this prospectus supplement on or about July 5, 2018.

We have agreed to pay the placement agent a total cash fee equal to 7.0% of the gross proceeds of this offering. We will also pay the placement agent $25,000 for non-accountable expenses and an expense allowance of $50,000 for legal fees and other out-of-pocket expenses. We estimate the total expenses payable by us for this offering will be approximately $0.4 million, which amount includes the placement agent's fees and reimbursable expenses. In addition, we have agreed to issue to the placement agent Placement Agent Warrants to purchase up to 7.0% of the aggregate number of shares of common stock sold in this offering (103,186 shares). The Placement Agent Warrants will have substantially the same terms as the Warrants issued to the investors in the concurrent private placement, except that the Placement Agent Warrants will have an exercise price equal to $3.464, or 125% of the offering price per share in this offering and such Placement Agent Warrants will be exercisable for five years from the effective date of this offering. Pursuant to FINRA Rule 5110(g), the Placement Agent Warrants and any shares issued upon exercise of the Placement Agent Warrants shall not be sold, transferred, assigned, pledged, or hypothecated, or be the subject of any hedging, short sale, derivative, put or call transaction that would result in the effective economic disposition of the securities by any person for a period of 180 days immediately following the date of effectiveness or commencement of sales of this offering, except the transfer of any security: (i) by operation of law or by reason of our reorganization; (ii) to any FINRA member firm participating in this offering and the officers or partners thereof, if all securities so transferred remain subject to the lock-up restriction set forth above for the remainder of the time period; (iii) if the aggregate amount of our securities held by the placement agent or related persons do not exceed 1% of the securities being offered; (iv) that is beneficially owned on a pro-rata basis by all equity owners of an investment fund, provided that no participating member manages or otherwise directs investments by the fund and the participating members in the aggregate do not own more than 10% of the equity in the fund; or (v) the exercise or conversion of any security, if all securities remain subject to the lock-up restriction set forth above for the remainder of the time period.

We have agreed to indemnify the placement agent and specified other persons against certain liabilities relating to or arising out of the placement agent's activities under the placement agency agreement and to contribute to payments that the placement agent may be required to make in respect of such liabilities.

The placement agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act, and any commissions received by it and any profit realized on the resale of the securities sold by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, the placement agent would be required to comply with the requirements of the Securities Act and the Exchange Act, including, without limitation, Rule 415(a)(4) under the Securities Act and Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of shares of common stock and warrants by the placement agent acting as principal. Under these rules and regulations, the placement agent:

- may not engage in any stabilization activity in connection with our securities; and

- may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until it has completed its participation in the distribution.

From time to time, the placement agent may provide in the future various advisory, investment and commercial banking and other services to us in the ordinary course of business, for which they have received and may continue to receive customary fees and commissions. However, except as disclosed in this prospectus supplement, we have no present arrangements with the placement agent for any further services. The placement agent acted as our sole book-running manager for our underwritten public offering we consummated in December 2017, for which it received compensation. The placement agent also acted as our exclusive placement agent for the May 2018 Registered Direct Public Offering and the May 2018 Private Placement, for which it received compensation.

PRIVATE PLACEMENT OF WARRANTS

In a concurrent private placement, we are selling to each of the investors in this offering for consideration of $0.125 per underlying Warrant Share, a Warrant to purchase an additional 65% of the number of shares purchased in this offering by each such investor. The aggregate number of Warrant Shares exercisable pursuant to the Warrants is 958,152. The Warrants will be exercisable at an exercise price of $2.70 per share. The exercise price and number of Warrant Shares issuable upon the exercise of the Warrants will be subject to adjustment in the event of any stock dividend and split, reverse stock split, recapitalization, reorganization or similar transaction, as described in the Warrants.

Each Warrant shall be exercisable immediately upon the date of issuance and have a term of exercise equal to 5.5 years from the initial exercise date. A holder of Warrants will have the right to exercise the Warrants on a "cashless" basis in certain circumstances as described in the Warrants, including, among others, while there is no effective registration statement registering the Warrant Shares issuable upon exercise of the Warrants. Subject to limited exceptions, a holder of Warrants will not have the right to exercise any portion of its Warrants if the holder, together with its affiliates, would beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after giving effect to such exercise, provided that the holder may increase or decrease the beneficial ownership limitation up to 9.99%, provided, further, that any increase in the beneficial ownership limitation shall not be effective until 61 days following notice of such change to the Company. In addition, in certain circumstances, upon a fundamental transaction, the holder will have the right to require us to repurchase its common warrants at their fair value using the Black Scholes option pricing formula; provided, however, such holder may not require us or our successor entity to repurchase the common warrants for the Black Scholes value solely in connection with a fundamental transaction that is not approved by our board of directors, and therefore not within our control.

The Warrants and the Warrant Shares are not being registered under the Securities Act pursuant to the registration statement of which this prospectus supplement and the accompanying base prospectus form a part and are not being offered pursuant to this prospectus supplement and the accompanying base prospectus. The Warrants and the Warrant Shares are being offered pursuant to the exemption provided in Section 4(a)(2) of the Securities Act and Rule 506(b) promulgated thereunder. All purchasers are required to be "accredited investors" as such term is defined in Rule 501(a) under the Securities Act.

LEGAL MATTERS

The validity of the securities offered hereby is being passed upon for us by Hogan Lovells US LLP.

EXPERTS

The financial statements incorporated in this Prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2017 have been so incorporated in reliance on the report (which contains an explanatory paragraph relating to the Company's ability to continue as a going concern as described in Note 1 to the financial statements) of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information into this prospectus supplement. This means that we can disclose important information to you by referring you to other documents we have filed separately with the SEC, without actually including the specific information in this prospectus supplement. The information incorporated by reference is considered to be part of this prospectus supplement, and information that we file later with the SEC (and that is deemed to be "filed" with the SEC) will automatically update, and may supersede, information in this prospectus supplement.

- Our Annual Report on Form 10-K for the year ended December 31, 2017 filed with the SEC on March 19, 2018;
- Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2018 filed with the SEC on May 10, 2018;
- Our Definitive Proxy Statement on Schedule 14A filed with the SEC on April 2, 2018, to the extent incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2017;
- Our Current Reports on Form 8-K filed with the SEC on January 26, 2018, January 30, 2018, February 5, 2018, February 12, 2018, March 6, 2018, March 19, 2018 (except Item 2.02 and Exhibit 99.1), April 18, 2018 (except Item 2.02), May 10, 2018 (except Item 2.02 and Exhibit 99.1), May 18, 2018, May 21, 2018, May 24, 2018, May 31, 2018, June 12, 2018 and June 22, 2018; and
- The description of our common stock contained in our registration statement on Form 8-A (File No. 001-31564) filed with the SEC on August 28, 2014, including any amendment or report filed for the purpose of updating such description.

All reports and other documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act after the date of this prospectus supplement and prior to the termination or completion of the offering of securities under this prospectus supplement shall be deemed to be incorporated by reference in this prospectus supplement and to be a part hereof from the date of filing such reports and other documents.

To obtain copies of these filings, see "Where You Can Find More Information" on page S-14 of this prospectus supplement.

WHERE YOU CAN FIND MORE INFORMATION

This prospectus supplement and the accompanying prospectus are part of the registration statement on Form S-3 we filed with the SEC under the Securities Act and do not contain all the information set forth in the registration statement. Whenever a reference is made in this prospectus supplement and the accompanying prospectus to any of our contracts, agreements or other documents, the reference may not be complete and you should refer to the exhibits that are a part of the registration statement or the exhibits to the reports or other documents incorporated herein by reference for a copy of such contract, agreement or other document. Because we are subject to the information and reporting requirements of the Exchange Act, we file annual, quarterly and current reports, proxy

statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at http://www.sec.gov. You may also read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room.

We make available free of charge on our website our annual, quarterly and current reports, including amendments to such reports, as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the SEC. Please note, however, that we have not incorporated any other information by reference from our website, other than the documents listed under the heading "Incorporation of Certain Information by Reference" on page S-14 of this prospectus supplement. In addition, you may request copies of these filings at no cost by writing or telephoning us at the following address or telephone number:

Office of the Corporate Secretary
Fibrocell Science, Inc.
405 Eagleview Blvd.
Exton, Pennsylvania 19341
(484) 713-6000

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PROSPECTUS

Fibrocell Science, Inc.

$150,000,000
Common Stock, Preferred Stock,
Debt Securities, Warrants, Units And Subscription Rights

This prospectus covers our offer and sale from time to time of any combination of common stock, preferred stock, debt securities, warrants, units or subscription rights described in this prospectus in one or more offerings. This prospectus provides a general description of the securities we may offer and sell. Each time we offer and sell securities we will provide specific terms of the securities offered in a supplement to this prospectus. The prospectus supplement may also add, update or change information contained in this prospectus. The aggregate offering price of all securities sold by us under this prospectus may not exceed $150,000,000.

The securities may be offered and sold by us from time to time at fixed prices, at market prices or at negotiated prices, and may be offered and sold to or through one or more underwriters, dealers or agents or directly to purchasers on a continuous or delayed basis. See "Plan of Distribution" in this prospectus and in the applicable prospectus supplement.

Our common stock is currently listed on The NASDAQ Capital Market on The Nasdaq Stock Market LLC ("NASDAQ") under the symbol "FCSC". On January 20, 2016, the last reported sale price of our common stock on NASDAQ was $2.96 per share.

You should rely only on the information contained or incorporated by reference in this prospectus. We have not authorized any other person to provide you with different information.

Investing in these securities involves risks, including those set forth in the "Risk Factors" section of our most recent Annual Report on Form 10-K, as revised or supplemented by our Quarterly Reports on Form 10-Q filed with the SEC since the filing of our most recent Annual Report on Form 10-K, each of which is incorporated by reference into this prospectus. We may include specific risk factors in supplements to this prospectus under the caption "Risk Factors." This prospectus may not be used to sell our securities unless accompanied by a prospectus supplement.

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

This prospectus is dated February 9, 2016.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the SEC. This prospectus covers the primary offering by us of up to an aggregate of $150,000,000 of securities. We may offer and sell any combination of the securities described in this prospectus in one or more offerings. This prospectus provides you with a general description of the securities we may offer and sell. Each time we offer and sell securities under this prospectus, we will provide a prospectus supplement that will contain specific information about the terms of that offering. The prospectus supplement may also add, update or change information contained in this prospectus. You should read both this prospectus and any prospectus supplement together with additional information described under the heading "Where You Can Find More Information."

We have filed or incorporated by reference exhibits to the registration statement of which this prospectus forms a part. You should read the exhibits carefully for provisions that may be important to you.

This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.

We have not authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus and any accompanying supplement to this prospectus. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus or any accompanying prospectus supplement. This prospectus and any accompanying supplement to this prospectus do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus and any accompanying supplement to this prospectus constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction.

"Fibrocell," "Company," "we," "us" and "our" refer to Fibrocell Science, Inc. and its consolidated subsidiaries.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any document we file with the SEC at the SEC's public reference room at 100 F Street N.E., Washington, D.C. 20549. You may obtain information on the operation of the SEC's public reference facilities by calling the SEC at 1-800-SEC-0330. You can request copies of these documents, upon payment of a duplicating fee, by writing to the SEC at its principal office at 100 F Street NE, Room 1580, Washington, D.C. 20549-1004. The SEC maintains an Internet website at www.sec.gov that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. Our SEC filings are accessible through the Internet at that website. Our reports on Forms 10-K, 10-Q and 8-K, and amendments to those reports, are also available for download, free of charge, as soon as reasonably practicable after these reports are filed with the SEC, at our website at www.fibrocell.com. The content contained in, or that can be accessed through, our website is not a part of this prospectus.

INCORPORATION OF INFORMATION 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. The information incorporated by reference is considered to be part of this prospectus, and information that we file later

with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below:

- Our Annual Report on Form 10-K for the fiscal year ended December 31, 2014 that we filed with the SEC on March 13, 2015;
- Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2015 that we filed with the SEC on May 8, 2015;
- Our Quarterly Report on Form 10-Q for the quarter ended June 30, 2015 that we filed with the SEC on August 7, 2015;
- Our Quarterly Report on Form 10-Q for the quarter ended September 30, 2015 that we filed with the SEC on November 5, 2015;
- Our Definitive Proxy Statement on Schedule 14A filed with the SEC on April 30, 2015, to the extent incorporated by reference into our Annual Report on Form 10-K for the year ended December 31, 2014;
- Our Current Reports on Form 8-K filed with the SEC on March 18, 2015, April 21, 2015 (except Item 7.01 and Exhibit 99.1), May 1, 2015, May 12, 2015, June 8, 2015 (except Item 7.01 and Exhibit 99.1), June 24, 2015, July 20, 2015 (except Item 7.01 and Exhibit 99.1), July 21, 2015 (except for Item 2.02 and Exhibit 99.1), July 22, 2015, July 27, 2015, September 8, 2015, September 16, 2015, September 25, 2015, January 4, 2016 (excluding Item 7.01 and Exhibit 99.2), January 8, 2016 (including Item 2.02 but excluding Item 7.01 and Exhibit 99.1) (Our independent registered public accounting firm, PricewaterhouseCoopers LLP, has not audited, reviewed, compiled, or performed any procedures with respect to the preliminary financial data contained in Item 2.02. Accordingly, PricewaterhouseCoopers LLP does not express an opinion or any other form of assurance with respect thereto.) and January 21, 2016;
- The description of our common stock contained in our registration statement on Form S-3, filed on August 15, 2013, which description is incorporated in the Form 8-A filed with the SEC on August 28, 2014, and any amendment or reports filed for the purpose of updating that description;
- All documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, after the date of the initial filing of the registration statement of which this prospectus is a part and prior to the effectiveness of such registration statement; and
- All documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act on or after the date of this prospectus and before we stop offering the securities under this prospectus.

We will provide without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon his or her written or oral request, a copy of any or all documents referred to above which have been or may be incorporated by reference into this prospectus but not delivered with this prospectus excluding exhibits to those documents unless they are specifically incorporated by reference into those documents. You can request those documents from Fibrocell Science, Inc., 405 Eagleview Boulevard, Exton, Pennsylvania 19341, Attention: Chief Financial Officer, telephone (484) 713-6000.

The most recent information that we file with the SEC automatically updates and supersedes older information. The information contained in any such filing will be deemed to be a part of this prospectus, commencing on the date on which the filing is made.

Information furnished under Items 2.02 or 7.01 (or corresponding information furnished under Item 9.01 or any corresponding exhibit) in any past or future Current Report on Form 8-K that we file with the SEC, unless otherwise specified in such report or this prospectus, is not incorporated by reference in this prospectus.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference in this prospectus contain forward-looking statements. All statements that address operating performance, events or developments that we expect or anticipate will occur in the future are forward-looking statements. In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “could,” “would,” “expects,” “plans,” “anticipates,” “believes,” “estimates,” “projects,” “predicts,” “potential” and similar expressions intended to identify forward-looking statements.

These forward-looking statements are based on management’s beliefs and assumptions and on information currently available to our management. Our management believes that these forward-looking statements are reasonable as and when made. However, you should not place undue reliance on any such forward-looking statements because such statements speak only as of the date when made. We do not undertake any obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. In addition, forward-looking statements are subject to certain risks and uncertainties that could cause actual results, events and developments to differ materially from our historical experience and our present expectations or projections. Before making an investment decision, you should carefully consider these risks as well as any other information we include or incorporate by reference in this prospectus or include in any applicable prospectus supplement. You should read this prospectus and the documents that we have filed as exhibits to the registration statement of which this prospectus forms a part in their entireties.

RISK FACTORS

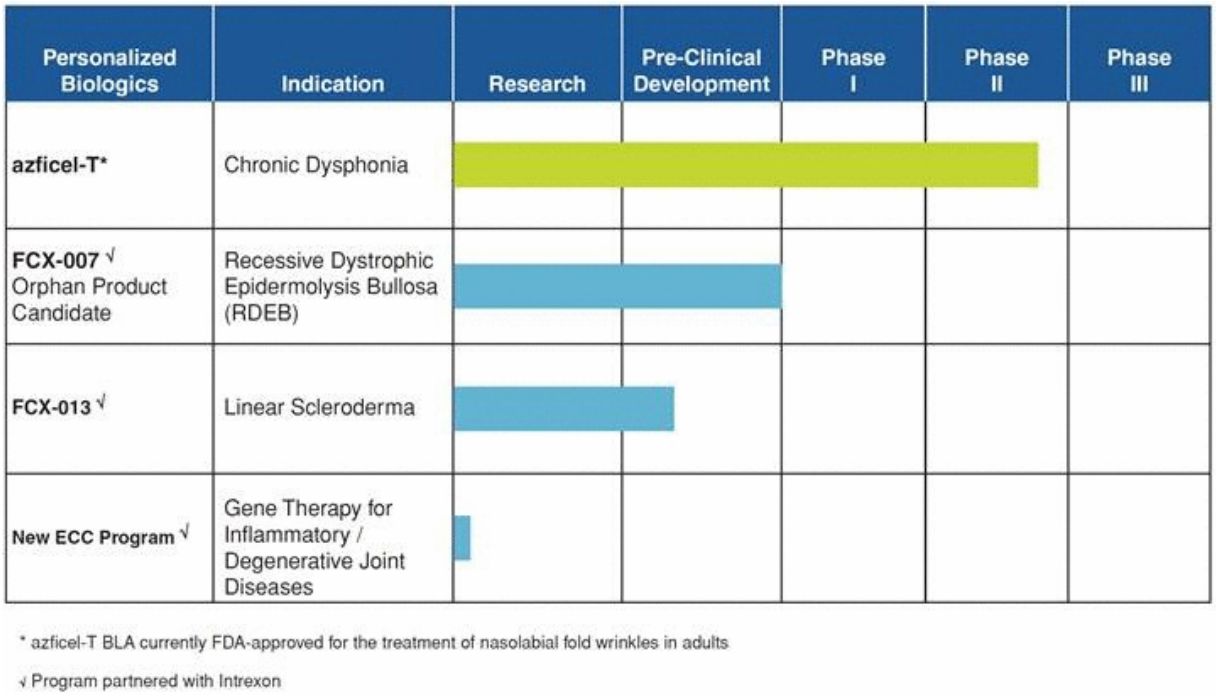
Our business is influenced by many factors that are difficult to predict, and that involve uncertainties that may materially affect actual operating results, cash flows and financial condition. Before making an investment decision, you should carefully consider these risks, including those set forth in the "Risk Factors" section of our most recent Annual Report on Form 10-K, as revised or supplemented by our Quarterly Reports on Form 10-Q filed with the SEC since the filing of our most recent Annual Report on Form 10-K, each of which is incorporated by reference into this prospectus, and you should also carefully consider any other information we include or incorporate by reference in this prospectus or include in any applicable prospectus supplement.

FIBROCELL SCIENCE, INC.

Overview

We are an autologous cell and gene therapy company translating personalized biologics into medical breakthroughs. All of our product candidates use our proprietary autologous fibroblast technology. Fibroblasts are the most common cells located in skin and connective tissue and are responsible for synthesizing extracellular matrix proteins that provide cellular structure and support. Our autologous fibroblast technology uses our patented manufacturing process, which involves collecting small skin biopsies from patients, separating the tissue into its component cells, then expanding the fibroblast cells using classic tissue culture techniques until the numbers are adequate for repeated injection. In this manner, each patient is treated with cells that were cultivated from his or her own dermal tissue (i.e., autologous).

Our current clinical and preclinical development program pipeline consists of the following:



Our most advanced development program is azficel-T for the treatment of chronic dysphonia resulting from vocal cord scarring or atrophy. We are currently in a Phase II clinical trial for this indication. We have completed dosing in this trial and expect to announce efficacy results in the second quarter of 2016.

In collaboration with Intrexon, we are also in preclinical development with two gene-therapy product candidates. Our lead gene-therapy product candidate, FCX-007, has received orphan drug designation as well as rare pediatric disease designation from the U.S. Food and Drug Administration ("FDA") and is in late-stage preclinical development for the treatment of recessive dystrophic epidermolysis bullosa ("RDEB"), a devastating, rare, congenital, painful, progressive blistering skin disease that typically leads to premature death. We are also in preclinical development of our second gene-therapy product candidate, FCX-013, for the treatment of linear scleroderma, an excess production of extracellular matrix characterized by skin fibrosis and linear scars. We plan to seek orphan drug designation for FCX-013.

We also recently expanded our collaboration with Intrexon to pursue the research, development and commercialization of products for the treatment of chronic inflammation and degenerative diseases of human joints, including arthritis and other related conditions, through intra-articular or other local administration of genetically modified fibroblasts.

Development Programs

Azficel-T for Chronic Dysphonia

Dysphonia is a reduction in vocal capacity and is caused by damage to the fibroblast layer of the vocal cords, which limits airflow and results in severe and significant limitations in voice quality. Depending on the severity of dysphonia, a patient's resulting voice is hoarse or raspy and is perceived by sufferers as a communication disorder. Severe cases can lead to a total loss of voice. We estimate that approximately 64,000 patients in the U.S. suffer with vocal fold scarring resulting in chronic or severe dysphonia. No long-term effective therapy is presently available, and rehabilitation of subjects (for example, with voice therapy) is difficult. In our Phase I clinical trial of azficel-T for chronic dysphonia, which involved a feasibility study to determine the safety and efficacy of injections for the treatment of chronic dysphonia in patients who had failed to improve following currently available treatments, a positive trend of sustained improvement was noted in a majority of clinical trial subjects. Our Phase II clinical trial for chronic dysphonia currently in progress is a double-blind, randomized, placebo-controlled trial that is designed to test the safety and efficacy of azficel-T in subjects with chronic dysphonia caused by idiopathic vocal cord scarring or atrophy. Efficacy endpoints will be assessed four months after administration of final treatment. We have completed dosing in this trial and expect to report efficacy results in the second quarter of 2016.

FCX-007 for RDEB

Recessive dystrophic epidermolysis bullosa is a congenital, progressive, devastatingly painful and debilitating genetic disorder that often leads to death, and is the most severe form of dystrophic epidermolysis bullosa ("DEB"). RDEB is caused by a mutation of the COL7A1 gene, the gene which encodes for type VII collagen ("COL7"), a protein that forms anchoring fibrils. Anchoring fibrils hold together the layers of skin, and without them, skin layers separate causing severe blistering, open wounds and scarring in response to any kind of friction, including normal daily activities like rubbing or scratching. Children who inherit the condition are often called "butterfly children" because their skin is as fragile as a butterfly's wings. We estimate that there are approximately 1,100 - 2,500 RDEB patients in the United States. Current treatments for RDEB address only the sequelae, including daily bandaging, hydrogel dressings, antibiotics, feeding tubes and surgeries.

FCX-007, our lead gene-therapy product candidate, is an autologous fibroblast cell genetically modified to express COL7. We are developing FCX-007 in collaboration with Intrexon. We submitted an investigational new drug application ("IND") for FCX-007 to the FDA in July 2015. In September 2015, we received feedback from the FDA on the IND which required us to delay the initiation of our proposed Phase I/II clinical trial. The FDA's feedback related to the areas of chemistry, manufacturing

and controls ("CMC"), toxicology and our proposed Phase I/II clinical trial protocol. Although the hybrid pharmacology/toxicology study performed based on the injection of FCX-007 into human skin that was xenografted onto SCID (severe combined immunodeficiency) mice was included in the IND and showed no signs of toxicity, the FDA requested that we execute a toxicology-specific study in which FCX-007 will be injected in non-grafted SCID mice. We have initiated this new toxicology study, and we expect to amend the IND in response to the FDA's feedback and to include data from the new study in the first quarter of 2016. As a result, we now expect to initiate a Phase I/II clinical trial for FCX-007 in the second quarter of 2016 subject to successful completion of the new toxicology study and addressing the FDA's other feedback.

FCX-013 for Linear Scleroderma

Linear scleroderma is a localized autoimmune skin disorder that manifests as excess production of extracellular matrix characterized by fibrosis and linear scars. The linear areas of skin thickening may extend to underlying tissue and muscle in children which may impair growth and development. Lesions appearing across joints can be painful, impair motion and may be permanent. Current treatments only address symptoms, including systemic or topical corticosteroids, UVA light therapy and physical therapy.

Our second gene-therapy product candidate, FCX-013, is also being developed in collaboration with Intrexon and is currently in preclinical development for the treatment of linear scleroderma. Our product development efforts to date have included gene selection and design, transduction efficiency and protein expression analysis, ligand development for use in connection with Intrexon's proprietary RheoSwitch Therapeutic System ("RTS") expression technology and analytical assay design. RTS is a biologic switch activated by a small molecule ligand that provides the ability to control level and timing of protein expression in those diseases where such control is critical. We have also successfully completed a proof-of-concept study for FCX-013 in which the primary objective was to determine whether the product candidate had the potential to reduce dermal thickness in fibrotic tissue. In this study, FCX-013 was evaluated in a bleomycin-induced scleroderma model, utilizing SCID mice. Data from the study demonstrated that FCX-013 reduced dermal thickness of fibrotic tissue to levels similar to non-bleomycin (saline) treated skin and further reduced the thickness of the sub-dermal muscle layer. FCX-013 will now be advanced into dose ranging studies for product optimization. We expect to submit an IND for FCX-013 to the FDA in 2017.

Research Collaboration with UCLA

We have a scientific research collaboration with the Regents of the University of California, Los Angeles ("UCLA") focusing on discoveries and technologies related to regenerative medicine. The technologies from this collaboration with UCLA may provide new development programs.

Commercial Programs

LAVIV (azficel-T) for Nasolabial Fold Wrinkles

LAVIV (azficel-T) is an FDA-approved biological product that uses our proprietary autologous fibroblast technology for the improvement of the appearance of moderate to severe nasolabial fold wrinkles in adults. In 2013, we shifted our strategic focus to rare skin and connective tissue diseases, resulting in the clinical and preclinical product candidates mentioned above. As a result, we no longer actively market or promote LAVIV to physicians but will continue to accept prescriptions, for which we expect a nominal amount in 2016. Given the limited use of LAVIV, we are experiencing difficulties in recruiting a sufficient number of subjects for the postmarketing study that the FDA required as a condition for the approval of LAVIV. We are actively engaged in discussions with the FDA about how to fulfill the requirement in light of the limited population of LAVIV users.

Corporate Information

Our corporate headquarters is located at 405 Eagleview Boulevard, Exton, Pennsylvania 19341. Our phone number is (484) 713-6000. Our corporate website is www.fibrocell.com. We make available free of charge on our website our annual, quarterly and current reports, including amendments to such reports, as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the SEC. Information contained on our website is not incorporated by reference into this prospectus supplement or the accompanying prospectus, and you should not consider information contained on our website as part of this prospectus supplement or the accompanying prospectus.

USE OF PROCEEDS

Unless otherwise indicated in a prospectus supplement, we anticipate that the net proceeds from our sale of any securities will be used to fund the development of our clinical and preclinical programs, for other research and development activities and for general corporate purposes, which may include capital expenditures and funding our working capital needs. We expect from time to time to evaluate the acquisition of businesses, products and technologies for which a portion of the net proceeds may be used, although we currently are not planning or negotiating any such transactions. Pending such uses, we may invest the net proceeds in investment grade interest-bearing securities.

The amounts actually expended for each purpose may vary significantly depending upon numerous factors, including the amount and timing of the proceeds from the offering and progress with our clinical development programs. Expenditures will also depend upon the establishment of collaborative arrangements with other companies, the availability of additional financing and other factors. Investors will be relying on the judgment of our management regarding the application of the proceeds of any sale of securities.

RATIO OF EARNINGS TO FIXED CHARGES

Any time debt securities are offered pursuant to this prospectus, we will provide a table setting forth our ratio of earnings to fixed charges on a historical basis in the applicable prospectus supplement, if required.

GENERAL DESCRIPTION OF SECURITIES WE MAY OFFER

We may offer shares of our common stock and preferred stock, various series of debt securities, warrants or units or subscription rights to purchase any of such securities, with a total value of up to $150,000,000, from time to time in one or more offerings under this prospectus at prices and on terms to be determined by market conditions at the time of the offering. This prospectus provides you with a general description of the securities that we may offer. In connection with each offering, we will provide a prospectus supplement that will describe the specific amounts, prices and terms of the securities being offered, including, to the extent applicable:

- designation or classification;
- aggregate offering price;
- rates and times of payment of dividends;
- redemption, conversion or exchange terms;
- conversion or exchange prices or rates and any provisions for changes to or adjustments in the conversion or exchange prices or rates and in the securities or other property receivable upon conversion or exchange;
- restrictive covenants;
- voting or other rights; and
- important federal income tax considerations.

The prospectus supplement also may add, update or change information contained in this prospectus or in documents we have incorporated by reference. However, no prospectus supplement will offer a security that is not included in the Registration Statement at the time of its effectiveness or offer a security of a type that is not described in this prospectus.

This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.

DESCRIPTION OF CAPITAL STOCK

Our authorized capital stock consists of 100,000,000 shares of common stock, par value $0.001 per share, and 5,000,000 shares of preferred stock, par value $0.001 per share. As of January 20, 2016, we had 43,898,785 shares of our common stock outstanding and zero shares of preferred stock outstanding. In addition, we had outstanding options to purchase 3,133,344 shares of common stock outstanding at a weighted average exercise price of $6.23 per share and warrants to purchase 5,666,779 shares of common stock outstanding at a weighted average exercise price of $7.14 per share.

Common Stock

Voting Rights

Each stockholder is entitled to one vote for each share of common stock held on all matters submitted to a vote of stockholders. Cumulative voting for any purpose is not authorized.

Dividends

Subject to preferences that may be applicable to any preferred stock outstanding at the time, the holders of our common stock shall be entitled to receive such dividends, if any, as may be declared from time to time by our board of directors without distinction to series.

Liquidation

Upon the liquidation, dissolution or winding up of our company, the remaining assets legally available for distribution to stockholders, after payment of claims or creditors and payment of liquidation preferences, if any, on outstanding preferred stock, are distributable ratably among the holders of our common stock and any participating preferred stock outstanding at that time. Each outstanding share of common stock is fully paid and nonassessable.

No Preemptive or Similar Rights

Our common stock is not subject to conversion or redemption and holders of our common stock are not entitled to preemptive rights.

Anti-Takeover Effects of Provisions of Delaware Law and our Charter Documents

Provisions of Delaware law and our Restated Certificate of Incorporation, as amended (the "Certificate of Incorporation"), and Fourth Amended and Restated Bylaws (the "Bylaws") could make the acquisition of our company through a tender offer, a proxy contest or other means more difficult and could make the removal of incumbent officers and directors more difficult. We expect these provisions to discourage coercive takeover practices and inadequate takeover bids and to encourage persons seeking to acquire control of our company to first negotiate with our Board of Directors. We believe that the benefits provided by our ability to negotiate with the proponent of an unfriendly or unsolicited proposal outweigh the disadvantages of discouraging these proposals. We believe the negotiation of an unfriendly or unsolicited proposal could result in an improvement of its terms.

Our Certificate of Incorporation provides for our Board of Directors to be divided into three classes serving staggered terms. Approximately one-third of the Board of Directors will be elected each year. The provision for a classified board could prevent a party who acquires control of a majority of the outstanding voting stock from obtaining control of the Board of Directors until the second annual stockholders' meeting following the date the acquirer obtains the controlling stock interest. The classified board provision could discourage a potential acquirer from making a tender offer or otherwise attempting to obtain control of our company and could increase the likelihood that incumbent directors will retain their positions.

Our Bylaws do not permit stockholders to call a special meeting of stockholders. Our Bylaws provide that special meetings of the stockholders may be called only by a majority of the members of our Board of Directors, our Chairman of the Board of Directors, our Chief Executive Officer or our President. Our Bylaws require that all stockholder actions be taken by a vote of the stockholders at an annual or special meeting, and do not permit our stockholders to act by written consent without a meeting. Our Bylaws provide for an advance notice procedure for stockholder proposals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to the Board of Directors. At an annual meeting, stockholders may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the Board of Directors. Stockholders may also consider a proposal or nomination by a person who was a stockholder of record on the record date for the meeting, who is entitled to vote at the meeting and who has given to our Secretary timely written notice, in proper form, of his, her or its intention to bring that business before the meeting. The Bylaws do not give our Board of Directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to

be conducted at a special or annual meeting of the stockholders. However, our Bylaws may have the effect of precluding the conduct of business at a meeting if the proper procedures are not followed. These provisions may also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of our company.

Preferred Stock

Our Board of Directors has the authority, without action by our stockholders, to designate and issue preferred stock in one or more series. Our Board of Directors may also designate the rights, preferences and privileges of each series of preferred stock, any or all of which may be greater than the rights of the common stock. It is not possible to state the actual effect of the issuance of any shares of preferred stock on the rights of holders of the common stock until our Board of Directors determines the specific rights of the holders of the preferred stock. However, these effects might include: (a) restricting dividends on the common stock; (b) diluting the voting power of the common stock; (c) impairing the liquidation rights of the common stock; and (d) delaying or preventing a change in control of our company without further action by our stockholders.

DESCRIPTION OF DEBT SECURITIES

This prospectus describes certain general terms and provisions of our debt securities. When we offer to sell a particular series of debt securities, we will describe the specific terms of the series in a supplement to this prospectus. The following description of debt securities will apply to the debt securities offered by this prospectus unless we provide otherwise in the applicable prospectus supplement. The applicable prospectus supplement for a particular series of debt securities may specify different or additional terms.

We may offer under this prospectus up to $150,000,000 aggregate principal amount of secured or unsecured debt securities, or if debt securities are issued at a discount, or in a foreign currency or composite currency, such principal amount as may be sold for a public offering price of up to $150,000,000. The debt securities may be either senior debt securities, senior subordinated debt securities or subordinated debt securities. The debt securities offered hereby will be issued under an indenture between us and a trustee. A form of indenture, which will be qualified under, subject to, and governed by, the Trust Indenture Act of 1939, as amended, is filed as an exhibit to the registration statement.

General

The terms of each series of debt securities will be established by or pursuant to a resolution of our board of directors and detailed or determined in the manner provided in a board of directors' resolution, an officers' certificate or by an indenture. The particular terms of each series of debt securities will be described in a prospectus supplement relating to the series, including any pricing supplement.

We can issue debt securities that may be in one or more series with the same or various maturities, at par, at a premium or at a discount. We will set forth in a prospectus supplement, including any pricing supplement, relating to any series of debt securities being offered, the initial offering price, the aggregate principal amount and the following terms of the debt securities:

- the title of the debt securities;
- the price or prices (expressed as a percentage of the aggregate principal amount) at which we will sell the debt securities;
- any limit on the aggregate principal amount of the debt securities;

- the date or dates on which we will pay the principal on the debt securities;
- the rate or rates (which may be fixed or variable) per annum or the method used to determine the rate or rates (including any commodity, commodity index, stock exchange index or financial index) at which the debt securities will bear interest, the date or dates from which interest will accrue, the date or dates on which interest will commence and be payable and any regular record date for the interest payable on any interest payment date;
- the place or places where the principal of, and premium and interest on, the debt securities will be payable;
- the terms and conditions upon which we may redeem the debt securities;
- any obligation we have to redeem or purchase the debt securities pursuant to any sinking fund or analogous provisions or at the option of a holder of debt securities;
- the dates on which and the price or prices at which we will repurchase the debt securities at the option of the holders of debt securities and other detailed terms and provisions of these repurchase obligations;
- the denominations in which the debt securities will be issued, if other than denominations of $1,000 and any integral multiple thereof;
- whether the debt securities will be issued in the form of certificated debt securities or global debt securities;
- the portion of principal amount of the debt securities payable upon declaration of acceleration of the maturity date, if other than the principal amount;
- the currency of denomination of the debt securities;
- the designation of the currency, currencies or currency units in which payment of principal of, and premium and interest on, the debt securities will be made;
- if payments of principal of, and premium or interest on, the debt securities will be made in one or more currencies or currency units other than that or those in which the debt securities are denominated, the manner in which the exchange rate with respect to these payments will be determined;
- the manner in which the amounts of payment of principal of, and premium or interest on, the debt securities will be determined, if these amounts may be determined by reference to an index based on a currency or currencies other than that in which the debt securities are denominated or designated to be payable or by reference to a commodity, commodity index, stock exchange index or financial index;
- any provisions relating to any security provided for the debt securities;
- any addition to or change in the events of default described in this prospectus or in the indenture with respect to the debt securities and any change in the acceleration provisions described in this prospectus or in the indenture with respect to the debt securities;
- any addition to or change in the covenants described in this prospectus or in the indenture with respect to the debt securities;
- any other terms of the debt securities, which may modify or delete any provision of the indenture as it applies to that series; and
- any depositaries, interest rate calculation agents, exchange rate calculation agents or other agents with respect to the debt securities.

We may issue debt securities that are exchangeable and/or convertible into other securities. The terms, if any, on which the debt securities may be exchanged and/or converted will be set forth in the applicable prospectus supplement. Such terms may include provisions for conversion, either mandatory, at the option of the holder or at our option, in which case the number of securities to be received by the holders of debt securities would be calculated as of a time and in the manner stated in the prospectus supplement.

We may issue debt securities that provide for an amount less than their stated principal amount to be due and payable upon declaration of acceleration of their maturity pursuant to the terms of the indenture. We will provide you with information on the federal income tax considerations and other special considerations applicable to any of these debt securities in the applicable prospectus supplement.

If we denominate the purchase price of any of the debt securities in a foreign currency or currencies or a foreign currency unit or units, or if the principal of and any premium and interest on any series of debt securities is payable in a foreign currency or currencies or a foreign currency unit or units, we will provide you with information on the restrictions, elections, general tax considerations, specific terms and other information with respect to that issue of debt securities and such foreign currency or currencies or foreign currency unit or units in the applicable prospectus supplement.

Payment of Interest and Exchange

Each debt security will be represented by either one or more global securities registered in the name of The Depository Trust Company, as Depositary, or a nominee of the Depositary (we will refer to any debt security represented by a global debt security as a book-entry debt security), or a certificate issued in definitive registered form (we will refer to any debt security represented by a certificated security as a certificated debt security), as described in the applicable prospectus supplement.

Certificated Debt Securities

You may transfer or exchange certificated debt securities at the trustee's office or paying agencies in accordance with the terms of the indenture. No service charge will be made for any transfer or exchange of certificated debt securities, but we may require payment of a sum sufficient to cover any tax or other governmental charge payable in connection with a transfer or exchange.

You may transfer certificated debt securities and the right to receive the principal of, and premium and interest on, certificated debt securities only by surrendering the old certificate representing those certificated debt securities and either we or the trustee will reissue the old certificate to the new holder or we or the trustee will issue a new certificate to the new holder.

Book-Entry Debt Securities

We may issue the debt securities of a series in the form of one or more book-entry debt securities that would be deposited with a depositary or its nominee identified in the prospectus supplement. We may issue book-entry debt securities in either temporary or permanent form. We will describe in the prospectus supplement the terms of any depositary arrangement and the rights and limitations of owners of beneficial interests in any book-entry debt security.

DESCRIPTION OF WARRANTS

General

We may issue warrants to purchase debt securities, common stock, preferred stock or other securities or any combination of the foregoing. We may issue warrants independently or together with other securities. Warrants sold with other securities may be attached to or separate from the other

securities. We will issue warrants under one or more warrant agreements between us and a warrant agent that we will name in the prospectus supplement.

The prospectus supplement relating to any warrants that we may offer will include specific terms relating to the offering. We will file the form of any warrant agreement with the SEC, and you should read the warrant agreement for provisions that may be important to you. The prospectus supplement will include some or all of the following terms:

- the title of the warrants;
- the aggregate number of warrants offered;
- the designation, number and terms of the debt securities, common stock, preferred stock or other securities purchasable upon exercise of the warrants, and procedures by which those numbers may be adjusted;
- the exercise price of the warrants;
- the dates or periods during which the warrants are exercisable;
- the designation and terms of any securities with which the warrants are issued;
- if the warrants are issued as a unit with another security, the date, if any, on and after which the warrants and the other security will be separately transferable;
- if the exercise price is not payable in U.S. dollars, the foreign currency, currency unit or composite currency in which the exercise price is denominated;
- any minimum or maximum amount of warrants that may be exercised at any one time;
- any terms, procedures and limitations relating to the transferability, exchange, exercise, amendment or termination of the warrants; and
- any adjustments to the terms of the warrants resulting from the occurrence of certain events or from the entry into or consummation by us of certain transactions.

DESCRIPTION OF UNITS

As specified in any applicable prospectus supplement, we may issue units consisting of one or more warrants, debt securities, shares of preferred stock, shares of common stock or any combination of such securities.

DESCRIPTION OF SUBSCRIPTION RIGHTS

As specified in any applicable prospectus supplement, we may issue subscription rights consisting of one or more debt securities, shares of preferred stock, shares of common stock or any combination of such securities.

PLAN OF DISTRIBUTION

We may sell the securities in one or more of the following ways (or in any combination) from time to time:

- to or through one or more underwriters or dealers in a public offering and sale by them;
- directly to a limited number of purchasers or to a single purchaser;
- through agents;

- through block trades in which the broker or dealer engaged to handle the block trade will attempt to sell the securities as agent, but may position and resell a portion of the block as principal to facilitate the transaction; or
- in any manner, as provided in the applicable prospectus supplement.

Each time we offer and sell securities under this prospectus, we will file a prospectus supplement. The prospectus supplement will state the terms of the offering of the securities, including:

- the name or names of any underwriters, dealers or agents;
- the purchase price of such securities and the proceeds to be received by us, if any;
- any underwriting discounts or agency fees and other items constituting underwriters' or agents' compensation;
- any public offering price;
- any discounts or concessions allowed or reallowed or paid to dealers; and
- any securities exchanges on which the securities may be listed.

Any public offering price and any discounts or concessions allowed or reallowed or paid to dealers may be changed from time to time.

If we use underwriters in the sale, the securities will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including:

- negotiated transactions;
- at a fixed public offering price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to prevailing market prices; or
- at negotiated prices.

Unless otherwise stated in a prospectus supplement, the obligations of the underwriters to purchase any securities will be conditioned on customary closing conditions and the underwriters will be obligated to purchase all of such series of securities, if any are purchased.

We may sell the securities through agents from time to time and may enter into arrangements for "at-the-market" offerings or similar transactions. The prospectus supplement will name any agent involved in the offer or sale of the securities and any commissions we pay to them. Generally, any agent will be acting on a best efforts basis for the period of its appointment. An agent may also choose to purchase securities for its own account, as principal.

We may authorize underwriters, dealers or agents to solicit offers by certain purchasers to purchase the securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. The contracts will be subject only to those conditions set forth in the prospectus supplement, and the prospectus supplement will set forth any commissions we pay for solicitation of these contracts.

In offering the shares covered by this prospectus, any broker-dealers and any other participating broker-dealers who execute sales, may be deemed to be "underwriters" within the meaning of the Securities Act in connection with these sales. Any profits realized by such broker-dealers may be deemed to be underwriting discounts and commissions.

Underwriters and agents may be entitled under agreements entered into with us to indemnification by us against certain civil liabilities, including liabilities under the Securities Act, or to contribution with

respect to payments which the underwriters or agents may be required to make. Underwriters and agents may be customers of, engage in transactions with, or perform services for us and our affiliates in the ordinary course of business.

Each series of securities will be a new issue of securities and will have no established trading market other than the common stock which is listed on NASDAQ. Any underwriters to whom securities are sold for public offering and sale may make a market in the securities, but such underwriters will not be obligated to do so and may discontinue any market making at any time without notice. The securities, other than the common stock, may or may not be listed on a national securities exchange.

The underwriters, dealers and agents may engage in other transactions with us, or perform other services for us, in the ordinary course of their business.

EXPERTS

The consolidated financial statements of Fibrocell appearing in its Annual Report (Form 10-K) for the year ended December 31, 2014, and the effectiveness of Fibrocell's internal control over financial reporting as of December 31, 2014, have been audited by BDO USA, LLP, independent registered public accounting firm, as set forth in their reports thereon, included therein, and incorporated herein by reference in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

LEGAL MATTERS

Pepper Hamilton LLP will provide us with an opinion as to certain legal matters in connection with the securities being offered hereby.

Table of Contents

1,474,080 Shares of Common Stock

FIBROCELL SCIENCE, INC.

Prospectus Supplement

H.C. Wainwright & Co.

July 2, 2018