ORGANOVO HOLDINGS, INC.
Form 424B5
March 16, 2018
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Filed Pursuant to 424(b)(5)
Registration No. 333-222929

PROSPECTUS SUPPLEMENT

(To Prospectus dated February 22, 2018)

Up to $50,000,000

Common Stock

We have entered into a Sales Agreement (the Sales Agreement) with H.C. Wainwright & Co., LLC and JonesTrading Institutional Services LLC (each an Agent and together, the Agents), relating to shares of our common stock offered by this prospectus supplement and the accompanying prospectus. In accordance with the terms of the Sales Agreement, we may offer and sell shares of our common stock from time to time through the Agents, having an aggregate offering price of up to $50 million, pursuant to this prospectus supplement and the accompanying prospectus.

Our common stock is listed on The Nasdaq Global Market under the symbol ONVO. On March 15, 2018, the last reported sale price of our common stock on The Nasdaq Global Market was $1.08 per share.

Sales of our common stock, if any, under this prospectus supplement and the accompanying prospectus may be made in sales deemed to be an at the market offering as defined in Rule 415(a)(4) promulgated under the Securities Act of 1933, as amended (the Securities Act). The Agents are not required to sell any specific number or dollar amounts of securities but will act as sales agents using their commercially reasonable efforts consistent with their respective normal trading and sales practices, on mutually agreed terms between the Agents and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

The Agents will be entitled to compensation under the terms of the Sales Agreement at a commission rate of up to 3.0% of the gross sales price per share sold by such Agent. In connection with the sale of the common stock on our behalf, the Agents will each be deemed to be an underwriter within the meaning of the Securities Act and the compensation of the Agents will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to the Agents against certain civil liabilities, including liabilities under the Securities Act.

Investing in our common stock involves a high degree of risk. See Risk Factors beginning on page S-5 of this prospectus supplement and page 5 of the accompanying prospectus, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement and the accompanying prospectus.

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

H.C. Wainwright & Co. **JonesTrading**

The date of this prospectus supplement is March 16, 2018.

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Prospectus Supplement

Prospectus

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement relates to the offering of our common stock. Before buying any of the common stock that we are offering, we urge you to carefully read this prospectus supplement and the accompanying prospectus, together with the information incorporated by reference as described under the headings Where You Can Find More Information and Incorporation of Certain Information by Reference in this prospectus supplement. These documents contain important information that you should consider when making your investment decision.

This document is in two parts. The first part is this prospectus supplement, which describes the specific terms of the common stock we are offering and also adds to and updates information contained in the accompanying prospectus and the documents incorporated by reference into this prospectus supplement and the accompanying prospectus. The second part, the accompanying prospectus dated February 22, 2018, including the documents incorporated by reference therein, provides more general information. 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, on the one hand, and the information contained in the accompanying prospectus or in any document incorporated by reference that was filed with the Securities and Exchange Commission (the SEC) before the date of this prospectus supplement, on the other hand, you should rely on the information in this prospectus supplement. If any statement in one of these documents is inconsistent with a statement in another document having a later date for example, a document incorporated by reference into this prospectus supplement and the accompanying prospectus the statement in the document having the later date modifies or supersedes the earlier statement.

You should rely only on the information contained in, or incorporated by reference into this prospectus supplement, the accompanying prospectus and in any free writing prospectus that we may authorize for use in connection with this offering. We have not, and the Agents have not, authorized any other person to provide you with different information. If anyone provides you with additional, different or inconsistent information, you should not rely on it. We are not, and the Agents are not, making an offer to sell or soliciting an offer to buy our 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. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus, and in any free writing prospectus that we may authorize for use in connection with this offering, is accurate only as of the date of those respective documents. Our business, financial condition, results of operations and prospects may have changed since those dates. You should read this prospectus supplement, the accompanying prospectus, the documents incorporated by reference into this prospectus supplement and the accompanying prospectus, and any free writing prospectus that we may authorize for use in connection with this offering, in their entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the sections of this prospectus supplement entitled Where You Can Find More Information and Incorporation of Certain Information by Reference.

The distribution of this prospectus supplement and the accompanying prospectus and the offering of the common stock in certain jurisdictions may be restricted by law. Persons outside the United States who come into possession of this prospectus supplement and the accompanying prospectus must inform themselves about, and observe any restrictions relating to, the offering of the common stock and the distribution of this prospectus supplement and the accompanying prospectus outside the United States. This prospectus supplement and the accompanying prospectus do not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any securities offered by this prospectus supplement and the accompanying prospectus by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

We own or have rights to use the trademarks and trade names that we use in conjunction with the operation of our business. Solely for convenience, our trademarks and trade names referred to in this prospectus may appear without the ® or symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the right of the applicable licensor to these trademarks and trade names.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement and the accompanying prospectus and the documents incorporated herein by reference contain, or will contain, forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the Securities Act), and Section 21E of the Exchange Act.

Any statements contained in this prospectus supplement and the accompanying prospectus and the documents incorporated herein by reference that do not describe historical facts constitute forward-looking statements. These forward-looking statements relate to anticipated future events, future results of operations or future financial performance, and include, but are not limited to: statements relating to our outlook for fiscal year 2018; the market opportunity for our product and service offerings; the expected benefits and efficacy of our product and service offerings; our ability to successfully develop new product and service offerings based on our technology; the availability of the additional funding necessary to support our operations and to allow us to implement our business plans; and our ability to complete the additional preclinical studies required to submit an IND to pursue the use of our human liver tissue as a therapeutic tissue. In some cases, you can identify forward-looking statements by terminology such as may, might, will, should, intends, expects, plans, goals, projects, anticipates, believes, potential, or continue or the negative of these terms or other comparable terminology.

These forward-looking statements are based on our current expectations, but are uncertain and involve substantial known and unknown risks, uncertainties and other factors which may cause our (or our industry s) actual results, levels of activity or performance to be materially different from any future results, levels of activity or performance expressed or implied by these forward-looking statements. The factors that could cause our actual future results to differ materially from current expectations include, but are not limited to: we may not be successful in growing demand for and increasing revenues from our existing products and services; our products and services may not meet customer expectations and demands; we may not be successful in developing new products and/or services based on our technology on a timely basis, or at all; we may not be successful in securing additional contracted collaborative relationships; the final results of our preclinical studies, which may be different from results obtained in our prior studies or interim preclinical data results, may not support further clinical development of our therapeutic tissues; we may not be successful in securing the additional funds required to support our long-term development plans; and we may not successfully protect our intellectual property. These factors and other considerations are described in greater detail in the Risk Factors section of this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein. You should consider these Risk Factors, as well as any Risk Factors that we include in our future filings with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, incorporated by reference into this prospectus supplement and the accompanying prospectus before making an investment decision. Any of the risks, as well as additional risks and uncertainties not currently known to us or that we currently deem immaterial, could materially and adversely affect our results of operations or financial condition.

As a result, you should not place undue reliance on these forward-looking statements, which speak only as of the date that they were made. The cautionary statements made in this prospectus regarding forward-looking statements should be considered with any written or oral forward-looking statements that we may issue in the future.

Except as required by applicable law, including the securities laws of the United States, we do not intend to update the forward-looking statements to conform to actual results or later events or circumstances or to reflect the occurrence of unanticipated events. Thus, 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.

You should read this prospectus supplement, the accompanying prospectus, the documents we have filed with the SEC that are incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering completely and with the understanding that our actual future results may be materially different from what we currently expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

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PROSPECTUS SUPPLEMENT SUMMARY

This summary highlights certain information about us, this offering and selected information contained elsewhere in or incorporated by reference into this prospectus supplement and the accompanying prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our common stock. For a more complete understanding of our company and this offering, we encourage you to read and consider carefully the more detailed information in this prospectus supplement and the accompanying prospectus, including the information incorporated by reference into this prospectus supplement and the accompanying prospectus, and the information included in any free writing prospectus that we have authorized for use in connection with this offering, including the information contained in and incorporated by reference under the heading Risk Factors beginning on page S-5 of this prospectus supplement, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement and the accompanying prospectus.

Overview

We are a biotech company focused on developing and commercializing a proprietary platform technology to produce and study living tissues that emulate key aspects of human biology and disease. Our proprietary platform can be employed in drug discovery and development, and as therapeutic implants for the treatment of damaged or diseased tissues and organs. Our business model aims to generate an attractive, growing stream of fee-for-service, product, collaboration, grant, and licensing revenues by providing pharmaceutical and biotech clients access to our platform technology to facilitate breakthrough translational research from target discovery to high content clinical profiling of drug candidates. Our product revenues are generated through Samsara, our wholly-owned subsidiary, which specializes in the procurement, preparation, and curation of a broad range of human cells which form the building blocks of Organovo s and our client s research programs.

The funds received from our various revenue agreements help to support our therapeutics research program, which is aimed at generating multiple Investigative New Drug (IND) Application track products. Our initial focus is on critical unmet medical needs in the liver disease space, including our lead program for NovoTissues® targeting Alpha-1 antitrypsan deficiency, for which we have received an Orphan Drug Designation (ODD) from the Food and Drug Administration (FDA). We believe our foundational and proprietary approach to the 3D printing of living tissues, as disclosed in peer-reviewed scientific publications, and the continuous evolution of our core bioengineering technology platform combine to provide us with the opportunity to fill many critical gaps in commercially available human disease modeling and tissue transplantation.

We continuously engage in research and development to enhance our platform technology, to develop new product and service offerings and to pursue our therapeutic initiatives. Our research and development efforts include internal initiatives as well as collaborative development opportunities with third parties. While our proof of principle work spans multiple organs and tissue types, our current focus has been on developing a broad range of tissue applications for the liver and kidney, which aligns well with major therapeutic areas of focus in the pharmaceutical and biotech industry. Specifically, we are developing disease models that allow researchers to explore the interaction of their drugs with diseased liver and kidney tissue, from the onset of disease to advanced stages. Organovo continues to receive client and peer review distinction for the study of Non-Alcoholic Steatohepatitis (NASH), which is a significant and growing disease area affecting 10-15% of the U.S. population. Our clients are closely engaged with us to develop screening applications in NASH to offset the lack of comprehensive preclinical and animal models with the added benefit that our platform may provide a valuable early indication of how client drugs may perform in the human clinical setting. Our tissue models in both liver and kidney fibrosis also represent key areas of client engagement. Other proof-of-concept research areas in recent years have included the gut, skin, hair follicle, and other undisclosed tissue programs.

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Organovo s initial therapeutics focus is on a series of genetic diseases, broadly labeled Inborn Errors of Metabolism (IEM s) where the native liver exhibits a specific genetic abnormality blocking its ability to perform a basic metabolic function such as processing ammonia or generating a specific and necessary enzyme such as Alpha-1 antitrypsin. These deficiencies ultimately can lead to a dangerous accumulation of toxins and/or chronic damage that is often fatal if not addressed by ongoing medical care and an organ transplant. Our therapeutic strategy is to create small implantable tissue patches , NovoTissues, which may one day postpone or obviate the need for a complete organ transplant. Our first IND program will target Alpha-1 antitrypsin deficiency. In December 2017, the FDA granted Organovo ODD for Alpha-1 antitrypsin deficiency, which confers certain regulatory access, streamlining, and financial benefits to our program. We expect to file our first IND by the end of calendar 2020, and we intend to develop additional IND track programs utilizing our NovoTissues to target other indications within this disease category.

Corporate Information

We are operating the business of our subsidiaries, including Organovo, Inc., our wholly-owned subsidiary, which we acquired in February 2012. Organovo, Inc. was incorporated in Delaware in April 2007. Our common stock has traded on The Nasdaq Global Market under the symbol ONVO since August 8, 2016. Prior to that time it traded on the NYSE MKT under the symbol ONVO and prior to that was quoted on the OTC Market. Our wholly-owned subsidiary, Samsara Sciences, Inc., was incorporated in Delaware in December 2014. In September 2015, we established another wholly-owned subsidiary in the United Kingdom, Organovo U.K., Ltd., for the primary purpose of establishing a sales presence in Europe.

Our principal executive offices are located at 6275 Nancy Ridge Dr., San Diego, California 92121 and our phone number is (858) 224-1000. Our Internet website can be found at http://www.organovo.com. The information found on our Internet website is not part of this prospectus supplement.

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THE OFFERING

Common stock offered by us	Shares of our common stock having an aggregate offering price of up to $50 million.
Common stock to be outstanding after this offering	Up to 155,618,922 shares, assuming, for illustrative purposes, the sale of 46,296,296 shares at a price of $1.08 per share, which was the closing price of our common stock on The Nasdaq Global Market on March 15, 2018. The actual number of shares issued will vary depending on the sales prices under this offering.
Plan of Distribution	At the market offering that may be made from time to time through the Agents. See Plan of Distribution on page S-12.
Use of Proceeds	We currently intend to use the net proceeds from the sale of the securities offered hereby for operating costs, research and development and for general corporate purposes, including working capital. We may also use a portion of the net proceeds to invest in or acquire businesses or technologies that we believe are complementary to our own, although we have no current plans, commitments or agreements with respect to any acquisitions as of the date of this prospectus. See Use of Proceeds on page S-9 of this prospectus supplement.
Risk Factors	Investing in our common stock involves a high degree of risk. Please read the information contained in and incorporated by reference under the heading Risk Factors on page S-5 of this prospectus supplement, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement.
The Nasdaq Global Market symbol	ONVO

The number of shares of common stock that will be outstanding after this offering as shown above is based on 109,322,626 shares of common stock outstanding as of December 31, 2017 and excludes the following, all as of December 31, 2017:

- 11,432,145 shares of common stock issuable upon the vesting and exercise of stock options outstanding at a weighted average exercise price of approximately $4.30 per share;

220,000 shares of our common stock issuable upon the exercise of outstanding warrants with a weighted average exercise price of $7.19 per share;

2,152,972 shares of common stock issuable upon the vesting and settlement of outstanding restricted stock units;

208,822 shares of common stock issuable upon the vesting and settlement of outstanding performance-based restricted stock units;

3,304,579 shares of common stock available for issuance pursuant to the 2012 Equity Incentive Plan; and

1,372,960 shares of common stock available for issuance pursuant to the 2016 Employee Stock Purchase Plan.

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Additionally, the number shares to be outstanding after this offering does not reflect certain issuances and actions that occurred after the quarter December 31, 2017, including (i) the issuance and sale of 1,513,347 shares of our common stock pursuant to our at-the-market sales program, at a weighted average price of $1.40 per share, (ii) the issuance of restricted stock units for 36,800 shares of our common stock pursuant to our 2012 Equity Incentive Plan and (iii) 87,857 shares of common stock that were issued pursuant to our 2016 Employee Stock Purchase Plan.

Unless otherwise indicated, all information in this prospectus supplement assumes no exercise of outstanding stock options or warrants to purchase shares of common stock or the issuance of shares of common stock pursuant to vesting and settlement of restricted stock units after December 31, 2017.

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RISK FACTORS

An investment in our common stock involves a high degree of risk. You should carefully consider the risks described under Risk Factors in our most recent Annual Report on Form 10-K and Quarterly Reports on Form 10-Q, as updated by our subsequent filings under the Securities Exchange Act of 1934, as amended, or the Exchange Act, and all of the other information contained in this prospectus supplement and the accompanying prospectus, and incorporated by reference into this prospectus supplement and the accompanying prospectus, including our financial statements and related notes, before investing in our common stock. If any of the possible events described below or in those sections actually occur, our business, business prospects, cash flow, results of operations or financial condition could be harmed, the trading price of our common stock could decline, and you might lose all or part of your investment in our common stock. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our operations and results.

Risks Related to this Offering of our Common Stock

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

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

Our common stock prices may be volatile which could cause the value of our common stock to decline.

The trading price of our common stock is likely to be highly volatile and could fluctuate in response to factors such as:

- actual or anticipated variations in our operating results;
- announcements of developments by us or our competitors, including new product and service offerings;
- regulatory actions regarding our products or services;
- reduced government funding for research and development activities;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- adoption of new accounting standards affecting our industry;

- additions or departures of key personnel;
- introduction of new products by us or our competitors;
- sales of our common stock or other securities in the open market;
- degree of coverage of securities analysts and reports and recommendations issued by securities analysts regarding our business;
- volume fluctuations in the trading of our common stock; and
- other events or factors, many of which are beyond our control.

The stock market is subject to significant price and volume fluctuations. In the past, following periods of volatility in the market price of a company s securities, securities class action litigation has often been initiated

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against such a company. Litigation initiated against us, whether or not successful, could result in substantial costs and diversion of our management s attention and resources, which could harm our business and financial condition.

Our common stock is subject to trading risks created by the influence of third party investor websites.

Our common stock is widely traded and held by retail investors, and these investors are subject to the influence of information provided by third party investor websites and independent authors distributing information on the internet. This information has become influential because it is widely distributed and links to it appear as top company headlines on commonly used stock quote and finance websites, or through services such as Google alerts. These emerging information distribution models are a consequence of the emergence of the internet. Some information and content distribution is by individuals through platforms that mainly serve as hosts seeking advertising revenue. As such, we believe an incentive exists for these sites to increase advertising revenue by increasing page views, and for them to post or allow to be posted inflammatory information to achieve this end. It has been our experience that a significant portion of the information on these websites or distributed by independent authors about our Company is false or misleading, and occasionally, we believe, purposefully misleading. These sites and internet distribution strategies also create opportunity for individuals to pursue both pump and dump and short and distort strategies. We believe that many of these websites have little or no requirements for authors to have professional qualifications. While these sites sometimes require disclosure of stock positions by authors, as far as we are aware these sites do not audit the accuracy of such conflict of interest disclosures. We believe that many of these websites have few or lax editorial standards, and thin or non-existent editorial staffs. Despite our best efforts, we have not and may not be able in the future to obtain corrections to information provided on these websites about our Company, including both positive and negative information, and any corrections that are obtained may not be achieved prior to the majority of audience impressions being formed for a given article. These conditions create volatility and risk for holders of our common stock and should be considered by investors. We can make no guarantees that regulatory authorities will take action on these types of activities, and we cannot guarantee that legislators will act responsively, or ever act at all, to appropriately restrict the activities of these websites and authors.

You will experience immediate and substantial dilution.

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. For illustrative purposes only, assuming that an aggregate of $50 million of shares of our common stock are sold at the assumed offering price of $1.08 per share (the last reported sale price of our common stock on The Nasdaq Global Market on March 15, 2018), and after deducting commissions and estimated aggregate offering expenses payable by us, you will experience immediate dilution of $0.46 per share, representing the difference between our as adjusted net tangible book value per share as of December 31, 2017 after giving effect to this offering and the assumed offering price. In addition, we are not restricted from issuing additional securities in the future, including shares of common stock, securities that are convertible into or exchangeable for, or that represent the right to receive, common stock or substantially similar securities. The issuance of these securities may cause further dilution to our stockholders. The exercise of outstanding stock options and the vesting of outstanding restricted stock units may also result in further dilution of your investment. See the section entitled Dilution on page S-10 below for a more detailed illustration of the dilution you may incur if you participate in this offering.

Our management will have broad discretion over the actual amounts and timing of the expenditures of the proceeds we receive in this offering and might not apply the proceeds in ways that enhance our operating results or increase the value of your investment.

Our management will have broad discretion as to the actual amounts and timing of the expenditures of the net proceeds from this offering, and you will be relying on the judgment of our management regarding the application of these proceeds. Our management might not apply the net proceeds of this offering in ways that

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enhance our operating results or increase the value of your investment. Additionally, until the net proceeds we receive are used, they may be placed in investments that do not produce income or that lose value.

Certain anti-takeover defenses and applicable law may limit the ability of a third party to acquire control of us.

Our certificate of incorporation and bylaws contain provisions that could delay or prevent a change of control of our company or changes in our Board of Directors that our stockholders might consider favorable. Some of these provisions:

- authorize the issuance of preferred stock which can be created and issued by the Board of Directors without prior stockholder approval, with rights senior to those of the common stock;
- provide for a classified Board of Directors, with each director serving a staggered three-year term;
- prohibit our stockholders from filling board vacancies, calling special stockholder meetings, or taking action by written consent; and
- require advance written notice of stockholder proposals and director nominations.

In addition, we have elected to be subject to Section 203 of the Delaware General Corporation Law (the DGCL) by provision of our charter. In general, Section 203 of the DGCL prevents an interested stockholder (as defined in the DGCL) from engaging in a business combination (as defined in the DGCL) with us for three years following the date that person becomes an interested stockholder unless one or more of the following occurs:

- Before that person became an interested stockholder, our Board of Directors approved the transaction in which the interested stockholder became an interested stockholder or approved the business combination;
- Upon consummation of the transaction that resulted in the interested stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of our voting stock outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding (but not the outstanding voting stock owned by the interested stockholder) stock held by directors who are also officers of our Company and by employee stock plans that do not provide employees with the right to determine confidentially whether shares held under the plan will be tendered in a tender or exchange offer; or
- Following the transaction in which that person became an interested stockholder, the business combination is approved by our Board of Directors and authorized at a meeting of stockholders by the affirmative vote of the holders of at least 66 2/3% of our outstanding voting stock not owned by the interested stockholder.

The DGCL generally defines interested stockholder as any person who, together with affiliates and associates, is the owner of 15% or more of our outstanding voting stock or is our affiliate or associate and was the owner of 15% or more of our outstanding voting stock at any time within the three-year period immediately before the date of determination. As a result, our election to be subject to Section 203 of the DGCL could limit the ability of a third party to acquire control of us.

We do not intend to pay dividends on our common stock for the foreseeable future.

We have paid no dividends on our common stock to date and it is not anticipated that any dividends will be paid to holders of our common stock in the foreseeable future. While our future dividend policy will be based on the operating results and capital needs of our business, it is currently anticipated that any earnings will be retained to finance our future expansion and for the implementation of our business plan. As an investor, you should take note of the fact that a lack of a dividend can further affect the market value of our stock, and could significantly affect the value of any investment.

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Future sales of our common stock, or preferred stock, or of other securities convertible into our common stock or preferred stock, could cause the market value of our common stock to decline and could result in dilution of your shares.

We are authorized to issue 150,000,000 shares of common stock and 25,000,000 shares of preferred stock. As of December 31, 2017, there were an aggregate of 128,014,104 shares of our common stock issued and outstanding on a fully diluted basis and no shares of preferred stock outstanding. That total for our common stock includes 17,098,518 shares of our common stock that may be issued upon the exercise of outstanding stock options or upon the settlement of outstanding restricted stock units or is available for issuance under our equity incentive plans, 1,372,960 shares of common stock that may be issued through our Employee Stock Purchase Plan (ESPP), and 220,000 shares of our common stock that may be issued upon the exercise of outstanding warrants.

In the future, we may issue additional authorized but previously unissued equity securities to raise funds to support our continued operations and to implement our business plan. We may also issue additional shares of our capital stock or other securities that are convertible into or exercisable for our capital stock in connection with hiring or retaining employees, future acquisitions, or for other business purposes. If we raise additional funds from the issuance of equity securities, substantial dilution to our existing stockholders may result. In addition, the future issuance of any such additional shares of capital stock may create downward pressure on the trading price of our common stock. There can be no assurance that we will not be required to issue additional shares, warrants or other convertible securities in the future in conjunction with any capital raising efforts, including at a price (or exercise prices) below the price at which shares of our common stock is currently traded on The Nasdaq Global Market. Moreover, depending on market conditions, we cannot be sure that additional financing will be available when needed or that, if available, financing will be obtained on terms favorable to us or to our stockholders.

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USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of our securities offered hereby. Except as described in any free writing prospectus that we may authorize to be provided to you, we currently intend to use the net proceeds from the sale of the securities offered hereby for operating costs, research and development and for general corporate purposes, including working capital. We may also use a portion of the net proceeds to invest in or acquire businesses or technologies that we believe are complementary to our own, although we have no current plans, commitments or agreements with respect to any acquisitions as of the date of this prospectus supplement.

The timing and amount of our actual expenditures will be based on many factors, including cash flows from operations and the anticipated growth of our business. As a result, our management will have broad discretion to allocate the net proceeds of the offerings. Pending their ultimate use, we intend to invest the net proceeds in short-term, investment-grade, interest-bearing instruments.

DIVIDEND POLICY

We have never declared or paid any dividends on our common stock and do not anticipate paying any in the foreseeable future. We currently intend to retain all of our future earnings, if any, to finance the operation and expansion of our business. Any future determination relating to our dividend policy will be made at the discretion of our Board of Directors and will depend on a number of factors, including future earnings, capital requirements, financial conditions, future prospects, contractual restrictions and covenants and other factors that our Board of Directors may deem relevant.

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DILUTION

If you invest in this offering, your ownership interest will be diluted to the extent of the difference between the public offering price per share and the as adjusted net tangible book value per share after giving effect to this offering. We calculate net tangible book value per share by dividing the net tangible book value, which is tangible assets less total liabilities, by the number of outstanding shares of our common stock. Dilution represents the difference between the portion of the amount per share paid by purchasers of shares in this offering and the as adjusted net tangible book value per share of our common stock immediately after giving effect to this offering. Our net tangible book value as of December 31, 2017 was approximately $47.5 million, or $0.44 per share.

For illustrative purposes, after giving effect to the sale of our common stock during the term of the Sales Agreement with the Agents in the aggregate amount of $50 million at an assumed offering price of $1.08 per share, the last reported sale price of our common stock on The Nasdaq Global Market on March 15, 2018, and after deducting commissions and estimated aggregate offering expenses payable by us, our net tangible book value as of December 31, 2017 would have been approximately $95.9 million, or approximately $0.62 per share of common stock. This represents an immediate increase in the net tangible book value of approximately $0.18 per share to our existing stockholders and an immediate dilution in net tangible book value of approximately $0.46 per share to new investors.

Assumed public offering price per share		$ 1.08
Net tangible book value per share as December 31, 2017	$ 0.44	
Increase per share attributable to investors purchasing our common stock in this offering	$ 0.18	
As adjusted net tangible book value per share as of December 31, 2017, after giving effect to this offering		$ 0.62
Dilution in net tangible book value per share to investors purchasing our common stock in this offering		$ 0.46

* Per share numbers may not add due to rounding

The table above assumes for illustrative purposes that an aggregate of 46,296,296 shares of our common stock are sold during the term of the Sales Agreement with the Agents at a price of $1.08 per share, the last reported sale price of our common stock on The Nasdaq Global Market on March 15, 2018, for aggregate gross proceeds of $50 million. The shares sold in this offering, if any, will be sold from time to time at various prices. An increase of $0.50 per share in the price at which the shares are sold from the assumed offering price of $1.08 per share shown in the table above, assuming all of our common stock in the aggregate amount of $50 million is sold at that price, would increase our adjusted net tangible book value per share after the offering from $0.62 per share to $0.68 per share and would increase the dilution in net tangible book value per share to new investors in this offering to $0.90 per share, after deducting commissions and estimated offering expenses payable by us. A decrease of $0.50 per share in the price at which the shares are sold from the assumed offering price of $1.08 per share shown in the table above, assuming all of our common stock in the gross aggregate amount of $50 million is sold at that price, would decrease our adjusted net tangible book value per share after the offering from $0.62 per share to $0.49 per share and would decrease the dilution in net tangible book value per share to new investors in this offering to $0.09 per share, after deducting commissions and estimated offering expenses payable by us. This information is supplied for illustrative purposes only.

The information and table above are based on based on 109,322,626 shares of common stock outstanding as of December 31, 2017 and excludes the following, all as of December 31, 2017:

- 11,432,145 shares of common stock issuable upon the vesting and exercise of stock options outstanding at a weighted average exercise price of approximately $4.30 per share;

- 220,000 shares of our common stock issuable upon the exercise of outstanding warrants with a weighted average exercise price of $7.19 per share;

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- 2,152,972 shares of common stock issuable upon the vesting and settlement of outstanding restricted stock units;

- 208,822 shares of common stock issuable upon the vesting and settlement of outstanding performance-based restricted stock units;

- 3,304,579 shares of common stock available for issuance pursuant to the 2012 Equity Incentive Plan; and

- 1,372,960 shares of common stock available for issuance pursuant to the 2016 Employee Stock Purchase Plan.

Additionally, subsequent to December 31, 2017, we effected certain issuances and actions that are not reflected in the information above, including (i) the issuance and sale of 1,513,347 shares of our common stock pursuant to our at-the-market sales program, at a weighted average price of $1.40 per share, (ii) the issuance of restricted stock units for 36,800 shares of our common stock pursuant to our 2012 Equity Incentive Plan and (iii) 87,857 shares of common stock that were issued pursuant to our 2016 Employee Stock Purchase Plan. To the extent options, restricted units or warrants outstanding as of December 31, 2017 are additionally exercised or settled or other shares are issued, there may be further dilution to investors. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

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PLAN OF DISTRIBUTION

We have entered into a Sales Agreement (the Sales Agreement) with H.C. Wainwright & Co., LLC and JonesTrading Institutional Services LLC (each an Agent and together, the Agents) under which we may offer and sell shares of our common stock having an aggregate gross sales price of up to $50 million from time to time through the Agents. The Sales Agreement has been filed as an exhibit to a Current Report on Form 8-K and incorporated by reference into this prospectus supplement and the accompanying prospectus.

Upon delivery of a placement notice and subject to the terms and conditions of the Sales Agreement, the Agents may sell shares of our common stock, if any, under this prospectus supplement and the accompanying prospectus, may be made in sales deemed to be an at the market offering as defined in Rule 415(a)(4) promulgated under the Securities Act. We or the Agents may suspend the offering of our common stock upon notice and subject to other conditions.

We will pay the Agents commissions, in cash, for their services in acting as agents in the sale of our common stock. The Agents will be entitled to compensation under the terms of the Sales Agreements at a commission rate of up to 3.0% of the gross sales price per share sold. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. We have also agreed to reimburse each of the Agents for certain specified expenses, including the fees and disbursements of their legal counsel in an amount not to exceed $50,000 in aggregate to the Agents. We estimate that the total expenses for the offering, excluding compensation and reimbursements payable to the Agents under the terms of the Sales Agreement, will be approximately $150,000.

Settlement for sales of common stock will occur on the second business day following the date on which any sales are made, or on some other date that is agreed upon by us and the applicable Agent in connection with a particular transaction or as otherwise required by law, in return for payment of the net proceeds to us. Sales of our common stock as contemplated in this prospectus will be settled through the facilities of The Depository Trust Company or by such other means as we and the Agents may agree upon. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

The Agents will use their respective commercially reasonable efforts, consistent with their respective sales and trading practices, to solicit offers to purchase the common stock shares under the terms and subject to the conditions set forth in the Sales Agreement. In connection with the sale of the common stock on our behalf, each Agent will be deemed to be an underwriter within the meaning of the Securities Act and the compensation of the Agents will be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to the Agents against certain civil liabilities, including liabilities under the Securities Act.

The offering of our common stock pursuant to the Sales Agreement will terminate upon the termination of the Sales Agreement as permitted therein. We and the Agents may each terminate the Sales Agreement at any time upon five days prior notice.

The Agents and their respective affiliates may in the future provide various investment banking, commercial banking and other financial services for us and our affiliates, for which services they may in the future receive customary fees. To the extent required by Regulation M, the Agents will not engage in any market making activities involving our common stock while the offering is ongoing under this prospectus.

This prospectus in electronic format may be made available on websites maintained by the respective Agents, and the Agents may distribute this prospectus supplement and the accompanying prospectus electronically.

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LEGAL MATTERS

The validity of the shares of common stock being offered by this prospectus will be passed upon for us by Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP, San Diego, California. H.C. Wainwright & Co., LLC and JonesTrading Institutional Services LLC are being represented in connection with this offering by Duane Morris LLP, Newark, New Jersey.

EXPERTS

The consolidated financial statements and management s assessment of the effectiveness of internal control over financial reporting (which is included in Management s Report on Internal Control over Financial Reporting) incorporated in this Prospectus Supplement by reference to the Annual Report on Form 10-K for the year ended March 31, 2017 have been so incorporated in reliance on the report of Mayer Hoffman McCann P.C., an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities offered by this prospectus supplement. This prospectus supplement and the accompanying prospectus, which are part of the registration statement, omits certain information, exhibits, schedules and undertakings set forth in the registration statement, as permitted by the SEC. For further information pertaining to us and the securities offered in this prospectus supplement, reference is made to that registration statement and the exhibits and schedules to the registration statement. Statements contained in this prospectus supplement and the accompanying prospectus as to the contents or provisions of any documents referred to in this prospectus are not necessarily complete, and in each instance where a copy of the document has been filed as an exhibit to the registration statement, reference is made to the exhibit for a more complete description of the matters involved.

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings can be read and copied at the SEC s Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the public reference room by calling the SEC at 1-800-SEC-0330. Also, the SEC maintains a website at www.sec.gov that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC, including us.

Our common stock is listed on The Nasdaq Global Market under the symbol ONVO. General information about our company, including our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as any amendments and exhibits to those reports, are available free of charge through our website at www.organovo.com as soon as reasonably practicable after we file them with, or furnish them to, the SEC. Information on, or than can be accessed through, our website is not incorporated into this prospectus supplement or other securities filings and is not a part of these filings.

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INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus supplement the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is an important part of this prospectus supplement, and later information that we file with the SEC will automatically update and supersede some of this information. We incorporate by reference the documents listed below and any future filings we make with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended (the Exchange Act), including filings made after the date of the initial registration statement, until we sell all of the shares covered by this prospectus supplement or the sale of shares by us pursuant to this prospectus supplement is terminated. In no event, however, will any of the information that we furnish to, pursuant to Item 2.02 or Item 7.01 of any Current Report on Form 8-K (including exhibits related thereto) or other applicable SEC rules, rather than file with, the SEC be incorporated by reference or otherwise be included herein, unless such information is expressly incorporated herein by a reference in such furnished Current Report on Form 8-K or other furnished document. The documents we incorporate by reference are:

- our Annual Report on Form 10-K for the year ended March 31, 2017, filed with the SEC on June 7, 2017;

- the information specifically incorporated by reference into our Annual Report on Form 10-K for the year ended March 31, 2017 from our definitive proxy statement relating to our 2017 annual meeting of stockholders, which was filed on June 14, 2017;

- our Quarterly Reports on Form 10-Q for the quarter ended June 30, 2017, filed with the SEC on August 9, 2017, quarter ended September 30, 2017, filed with the SEC on November 9, 2017 and quarter ended December 31, 2017, filed with the SEC on February 8, 2018;

- our Current Reports on Form 8-K or Form 8-K/A filed with the SEC on April 11, 2017, August 28, 2017, October 4, 2017, December 1, 2017 and March 16, 2018 (each to the extent filed and not furnished); and

- the description of our common stock contained in our registration statement on Form 8-A filed with the SEC on July 26, 2016.

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

We will provide each person, including any beneficial owner, to whom a prospectus supplement and the accompanying prospectus is delivered, a copy of any or all of the information that has been incorporated by reference into this prospectus supplement but not delivered with this prospectus supplement upon written or oral request at no cost to the requester. Requests should be directed to: Organovo Holdings, Inc., 6275 Nancy Ridge Dr., San Diego, California, Attn: Investor Relations, telephone: (858) 224-1000.

Information on, or that can be accessed through, our website is not incorporated into this prospectus or other securities filings and is not a part of these filings.

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PROSPECTUS

$100,000,000

Common Stock

Preferred Stock

Warrants

Units

We may offer and sell from time to time, in one or more series or issuances and on terms that we will determine at the time of the offering, any combination of the securities described in this prospectus, up to an aggregate amount of $100,000,000.

We will provide specific terms of any offering in a supplement to this prospectus. Any prospectus supplement may also add, update, or change information contained in this prospectus. You should carefully read this prospectus and the applicable prospectus supplement or issuer free writing prospectus relating to a particular offering as well as the documents incorporated or deemed to be incorporated by reference in this prospectus before you purchase any of the securities offered hereby.

These securities may be offered and sold in the same offering or in separate offerings; to or through underwriters, dealers, and agents; or directly to purchasers. The names of any underwriters, dealers, or agents involved in the sale of our securities, their compensation and any over-allotment options held by them will be described in the applicable prospectus supplement. None of our securities may be sold without delivery of the applicable prospectus supplement describing the method and terms of the offering of those securities. See Plan of Distribution.

Our common stock is listed on the Nasdaq Global Market under the symbol ONVO. On February 7, 2018, the last reported sale price for our common stock was $1.38 per share. We will provide information in any applicable prospectus supplement regarding any listing of securities other than shares of our common stock on any securities exchange.

Our principal executive offices are located at 6275 Nancy Ridge Drive, Suite 110, San Diego, CA 92121, and our telephone number at that address is (858) 224-1000.

You should read this prospectus and any prospectus supplement carefully before you invest.

INVESTING IN OUR SECURITIES INVOLVES SIGNIFICANT RISKS. SEE RISK FACTORS BEGINNING ON PAGE 5 OF THIS PROSPECTUS AND IN THE APPLICABLE PROSPECTUS SUPPLEMENT BEFORE INVESTING IN ANY SECURITIES.

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. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is February 22, 2018

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