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March 30, 2012

Division of Corporation Finance
U.S. Securities & Exchange Commission
100 F Street, NE
Washington, D.C. 20549

Attention: Mr. Jeffrey Riedler
Ms. Keira Ino
Mr. Gustavo Rodriguez
Mr. Michael Rosenthal
Ms. Jennifer Riegel

Re: Organovo Holdings, Inc.
Form 8-K
Filed February 13, 2012
No. 333-169928

Ladies and Gentlemen:

This letter responds to the letter of the staff (the "Staff") of the Securities and Exchange Commission (the "Commission"), dated March 13, 2012, to Keith Murphy, Chairman of the Board, Chief Executive Officer, and President of Organovo Holdings, Inc. (the "Company") regarding the Current Report on Form 8-K, File No. 333-169928 ("Form 8-K"), filed by the Company with the Commission on February 13, 2012.

This letter sets forth the comments of the Staff in the comment letter (numbered in accordance with the comment letter) and, following each comment, sets forth the Company's response. We are enclosing a copy of Amendment No. 1 to Form 8-K (the "Amended Form 8-K").

General

- 1. We note that you filed a confidential treatment request, in conjunction with the filing of this Form 8-K, on February 14, 2012. We will not be able to clear our review of your Form 8-K filing until we have also completed our review of that accompanying confidential treatment request.***

RESPONSE: The Company acknowledges the Staff's comment.

The Novogen MMX Bioprinter, page 15

- 2. You disclose that your NovoGen MMX Bioprinter™ is manufactured for you by Invetech Pty., of Melbourne, Australia. Please advise us whether you have an agreement with Invetech Pty. If so, please file a copy of this agreement as an exhibit and expand your disclosure to disclose all the material terms of the agreement. Alternatively, provide us with a detailed analysis that supports your conclusion that your business is not substantially dependent upon this agreement.***



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RESPONSE: As requested by the Staff, the Company has filed the manufacturing and supply agreement, dated as of March 3, 2011, by and between the Company and Invetech Pty as Exhibit 10.26 to the Amended Form 8-K. The Company has also revised the Business Section of the Amended Form 8-K to expand the disclosure of the material terms of this agreement. Additionally, concurrently with the filing of Amendment No. 1 to Form 8-K, the Company has submitted to the Staff a confidential treatment request with respect to certain portions of the agreement.

Collaborative Agreements, page 17

- 3. Given your financial position it appears that the collaborative agreements you disclose are material to your company. Please expand your disclosure here to include all the material terms of your agreements with both Pfizer and Unither, including, but not limited to material payment terms, aggregate amounts paid to date, material obligations that must be met by both parties to keep the agreement in place and termination provisions. In addition, please file each of these collaboration agreements as an exhibit to your next amendment. Alternatively, provide us with a detailed analysis that supports your conclusion that your business is not substantially dependent upon these agreements.***

RESPONSE: In response to the Staff's comment, the Company respectfully submits that the collaborative agreements with Pfizer and Unither are not material contracts as defined in Item 601(b)(10) of Regulation S-K. Under Item 601(b)(10), a contract is not material if the Company enters into the contract in the "ordinary course of business" and the Company's business is not "substantially dependent" on the contract. For the reasons set forth below, the Company has entered into the collaborative agreements with Pfizer and Unither in the ordinary course of its business and the Company's business is not substantially dependent on either of these agreements.

The Company is in the early stages of developing its bioprinter technology platform. As part of its business strategy, the Company intends to pursue collaboration agreements with drug development companies that will allow it to further develop its bioprinter technology and the potential uses of the cellular structures and tissues that can be produced with the Company's bioprinter technology. The Pfizer and Unither agreements represent the first of these ordinary course collaboration agreements.

Under these collaboration agreements, the drug development company will pursue drug discovery utilizing the three dimensional cellular structures developed with the Company's bioprinter technology. Currently, drug therapy research and testing generally involves testing drug candidates and therapies on monolayer two dimensional cell cultures that attempt to mimic damaged or degenerating tissues. The Company believes the use of its technology, which creates three dimensional cellular structures, will enhance and facilitate drug discovery.

The collaboration agreements provide for upfront and milestone payments to the Company related to the Company's research and development obligations under the agreement. In addition, the collaboration



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agreements provide for a future licensing arrangement between the parties, with royalties payable to the Company, if the drug discovery company is successful in identifying a drug candidate or therapy utilizing the Company's bioprinter technology.

In the case of Pfizer and Unither, the collaboration agreements provide for upfront and milestone payments designed to reimburse the Company for its research and development costs in performing its obligations under the agreements. The Company has not been and is not currently "substantially dependent" on these payments to support its business. To date, the Company has primarily relied upon funds raised through the sales of its equity securities and government grants to support its operations and the development of its bioprinter technology platform. Based on its business plan, the Company will continue to rely primarily on these sources of funds to support its operations and the development of its bioprinter technology. Accordingly, the Company has not been and is not currently "substantially dependent" upon the collaborative agreements with Pfizer and Unither, and as a result, the Company is electing not to file these ordinary course agreements under Item 601(b)(10). However, if the collaboration agreements lead to a potential drug candidate or therapy that could result in future royalty payments to the Company, the Company will publicly file any such agreement in accordance with its reporting obligations.

In response to the Staff's comment, the Company has revised the Business Section of the Amended Form 8-K to clarify that as a fundamental component of its business strategy the Company intends to continue to pursue and enter into collaboration agreements in the ordinary course of business. The Company has also provided investors with further detail and additional discussion regarding the terms of its existing and future collaboration agreements.

Intellectual Property, page 19

4. ***We note your disclosure here of your license agreements with University of Missouri-Columbia, Medical University of South Carolina and Clemson University. Regardless of the confidential treatment that was filed in conjunction with this Form 8-K, please expand your disclosure to include the aggregate milestone payments due under each agreement, a range of the royalty rates due under each agreement, aggregate amounts paid to date, material obligations that must be met by both parties to keep the agreement in place, duration and termination provisions. Please also file the agreement with Medical University of South Carolina as an exhibit to your next amendment.***

RESPONSE: In response to the Staff's comment, the Company has revised the Intellectual Property section of the Amended Form 8-K to expand the disclosure to include disclosure regarding the material terms of the Company's license agreements with the University of Missouri and Clemson University, including the aggregate milestone payments due under these agreements, a range of the royalty rates due under these agreements, aggregate amounts paid to date, material obligations that must be met by both parties to keep these agreements in place, duration and termination provisions. Additionally, the Company revised the disclosure to clarify that the University of Missouri-Columbia acquired certain rights from the Medical University of South Carolina, which it sublicensed to the Company pursuant to the terms of the University of Missouri license agreement. The Company has not entered into a separate license agreement with the Medical University of South Carolina and therefore will not be filing this agreement.



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5. ***Please disclose the expiration date of each of the material patents that you discuss.***

RESPONSE: In response to the Staff's comment, the Company revised the Intellectual Property section to disclose the expiration date, as applicable, of each of the material patents discussed.

Executive Compensation, page 54

6. ***Please expand your disclosure here to include all the material terms of Mr. Murphy's employment agreement, and please file the agreement as an exhibit to your next amendment, as you have for Mr. Michaels and Ms. Presnell.***

RESPONSE: In response to the Staff's comment, the Company revised the Executive Compensation section to disclose all the material terms of Mr. Murphy's employment agreement. Additionally, the Company has filed Mr. Murphy's employment agreement as Exhibit 10.1 to Current Report on Form 8-K, File No. 333-169928, filed with the Commission on March 1, 2012, which has been incorporated by reference in Amendment No. 1 to Form 8-K.

Exhibits, page 70

7. ***We note that for several agreements listed in this exhibit list you note that they are to be filed by amendment. Please promptly file all missing agreements with your next amendment.***

RESPONSE: In response to the Staff's comment, the Company has filed the missing agreements as Exhibits 4.1, 4.2, 4.3, 10.1, 10.2, 10.3, 10.4, 10.5 and 10.6 to Current Report on Form 8-K, File No. 333-169928 filed with the Commission on March 19, 2012.

Financial Statements for the Period Ended September 30, 2011

Summary of Significant Accounting Policies, page F-26

8. ***Please disclose your accounting policy for "prepaid expenses and other current assets" and "other assets." Disclose the nature of the items included in these line items and to the extent any of the items included in "prepaid expenses and other current assets" and "other assets" exceeds 5% of the current assets and total assets, respectively, separately quantify it in accordance with Rule 5-02 of Regulation S-X.***

RESPONSE: In response to the Staff's comment, the Company has disclosed its accounting policy for "prepaid expenses and other current assets" and "other assets" and has expanded the disclosure to include the nature of the items included in these line items and to the extent any of the items included in "prepaid expenses and other current assets" and "other assets" exceeds 5% of the current assets and total assets, respectively, has separately quantified it in accordance with Rule 5-02 of Regulation S-X.

9. ***You state on page 25 that you have collaborative research agreements with Pfizer and Unither and will seek to enter additional collaborations. You also disclose on page F-10 that you recognize revenues from collaboration agreements. Please disclose all of your collaboration agreements as required under ASC 808-10-50.***



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RESPONSE: In response to the Staff's comment, the Company has revised the Notes to Financial Statements to disclose all of its collaboration agreements and the relevant terms thereunder as required under ASC 808-10-50.

Licensing Agreements, page F-35

10. Please disclose the amount of prior patent costs you are required to reimburse, the gross carrying amount and accumulated amortization of the license agreements, the aggregate amortization expense for the periods presented, the weighted average amortization period, and the estimated aggregate amortization expense for each of the five succeeding fiscal years. Refer to ASC 350-30-50.

RESPONSE: In response to the Staff's comment, the Company has revised the Notes to Financial Statements to disclose the amount of prior patent costs the Company is required to reimburse, the gross carrying amount and accumulated amortization of the license agreements, the aggregate amortization expense for the periods presented, the weighted average amortization period, and the estimated aggregate amortization expense for each of the five succeeding fiscal years.

Unaudited Pro Forma Condensed Combined Balance Sheet page F-41

11. Please disclose the terms that require the warrants to be classified as a liability and the assumptions used to determine the value of the warrants.

RESPONSE: In response to the Staff's comment, the Company has revised the Notes to Financial Statements to disclose the terms that require the warrants to be classified as a liability and the assumptions used to determine the value of the warrants.

Notes to Unaudited Pro Forma Combined Financial Statements, page F-44.

12. Please ensure that the disclosures provided on page F-45 are complete and include appropriate dates.

RESPONSE: In response to the Staff's comment, the Company has revised the Notes to Financial Statements to complete the disclosures on page F-45 and included appropriate dates where applicable.

Acknowledgement:

As requested by the Staff, the Company hereby acknowledges that:

- the Company is responsible for the adequacy and accuracy of the disclosure in the filing;



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- Staff comments or changes to disclosure in response to Staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert Staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

* * *

Very truly yours,

DLA Piper LLP (US)

/s/ Jeffrey C. Thacker

Jeffrey C. Thacker
Partner