Organovo Describes First Fully Cellular 3D Bioprinted Kidney Tissue

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SAN DIEGO, April 1, 2015 /PRNewswire/ -- **Organovo Holdings, Inc. (NYSE MKT: ONVO)** ("Organovo"), a three-dimensional biology company focused on delivering breakthrough 3D bioprinting technology, presented data on the company's in vitro three-dimensional kidney tissue at the 2015 Experimental Biology conference in Boston, Massachusetts.

"Kidney represents an ideal extension of Organovo's capabilities to 3D bioprint organ tissues that can be tremendously useful in pharmaceutical research," said Keith Murphy, Chairman and Chief Executive Officer at Organovo. "The results released today admirably demonstrate a proof of concept that kidney is on the way to becoming another core commercial tissue for Organovo. The product that we intend to build from these initial results can be an excellent expansion for our core customers in toxicology, who regularly express to us an interest in having better solutions for the assessment of human kidney toxicity."

For the first time, fully human kidney proximal tubular tissues have been generated that are three-dimensional, and consist of multiple tissue-relevant cell types arranged to recapitulate the renal tubular / interstitial interface. The tissues are fabricated using Organovo's proprietary NovoGen^{TM} bioprinting platform, and will ultimately join the company's exVive3D^{TM} Liver tissues to expand the repertoire of physiologically-relevant tissue systems available for toxicity and efficacy testing as well as disease modeling. Dr. Sharon Presnell, Chief Technology Officer and Executive Vice President of Research and Development, stated, "Our bioprinted human kidney tissue represents a significant technical advance over the simple monolayer cell line cultures that predominate today. The histologic and functional features of the initial prototypes are compelling, and the *in vitro* durability of the system will likely enable the assessment of drug effects at chronic, physiologically relevant doses. Furthermore, the cellular complexity of the system will likely support mechanistic investigations into drug responses, including end points that have been difficult or impossible to assess *in vitro*, including tubular fibrosis and post-injury recovery."

Key findings and attributes from Organovo's research include:

- The kidney proximal tubule tissue is multi-cellular and fully human, consisting of polarized renal proximal tubular epithelial cells (RPTEC) and a living interstitial layer comprised of renal fibroblasts (RF), and endothelial cells (EC)
- Immunohistochemical analysis shows clear evidence of intercellular junction formation (E-Cadherin+) between the epithelial cells, extensive formation of microvascular structures, and stable maintenance of the layered architecture for at least two weeks *in vitro*
- The epithelial cells within the multi-layered tubular model express CYP450 mRNAs and possess gamma glutamyl transferase (GGT) activity, both of which are indicators of RPTEC function. Importantly, our initial characterization shows that the expression of GGT increases over two weeks post-fabrication, indicating a gain-of-function over time

About Organovo Holdings, Inc.

Organovo designs and creates functional, three-dimensional human tissues for use in medical research and therapeutic applications. The Company develops 3D human disease models through internal development and in collaboration with pharmaceutical and academic partners. Organovo's 3D human tissues have the potential to accelerate the drug discovery process, enabling treatments to be developed faster and at lower cost. The company recently launched its initial product of the planned exVive3D™ portfolio offering, a 3D Human Liver Tissue for use in Toxicology and other preclinical drug testing. Additional products are in development, with anticipated release for an exVive3DTM Human Kidney Tissue in the latter half of calendar year 2016. The Company also actively conducts early research on specific tissues for therapeutic use in direct surgical applications. In addition to numerous scientific publications, the Company's technology has been featured in The Wall Street Journal, Time Magazine, The Economist, and numerous other media outlets.

Organovo is changing the shape of medical research and practice. Learn more at www.organovo.com.

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Safe Harbor Statement

Any statements contained in this press release that do not describe historical facts may constitute forward-looking statements as that term is defined in the Private Securities Litigation Reform Act of 1995. Any forward-looking statements contained herein are based on current expectations, but are subject to a number of risks and uncertainties. The factors that could cause actual future results to differ materially from current expectations include, but are not limited to, risks and uncertainties relating to the Company's ability to develop, market and sell products based on its technology; the expected benefits and efficacy of the Company's products and technology; the market acceptance of the Company's products; and the Company's business, research, product development, regulatory approval, marketing and distribution plans and strategies. These and other factors are identified and described in more detail in our filings with the SEC, including our Quarterly Report on Form 10-Q filed with the SEC on February 6, 2015. You should not place undue reliance on these forward-looking statements, which speak only as of the date that they were made. These cautionary 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 any of the forward-looking statements to conform these statements to reflect actual results, later events or circumstances or to reflect the occurrence of unanticipated events.

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Barry Michaels, Chief Financial Officer, 858-224-1000, ext. 3, IR@organovo.com, or Gerry Amato, Amato and Partners, LLC, Investor Relations, gerald@amatoandpartners.com; Media Contact, Mike Renard, EVP, Commercial Operations, 858-224-1006, mrenard@organovo.com