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New Scaffold-Free 3D Bioprinting Method Available to Researchers for First Time in North America

Cell Applications primary cells and Regenova 3D Bio Printer from Cyfuse Biomedical combine to print robust 3D tissue without introduction of extraneous scaffolding material

SAN DIEGO, CALIF. — Feb. 3, 2016 — Cell Applications, Inc. and Cyfuse Biomedical K.K. have announced that advanced tissue-engineering services are now available in North America using a groundbreaking new three-dimensional (3D) bioprinting approach called the "Kenzan Method". Utilizing Cyfuse Biomedical's Regenova® 3D Bio Printer, a state-of-the-art robotic system that fabricates 3D tissue from cells, Cell Applications has created a powerful pay-for-service bio-printing model that makes scaffold-free tissue available immediately to scientists in the U.S. and Canada for research use.

"In addition to customized cell isolation and assay services, Cell Applications is now able to provide researchers with an integrated cell-engineering solution that utilizes our expansive primary cell bank and the innovative Kenzan bioprinting method," said James Yu, Founder and CEO, Cell Applications. "Having the Regenova 3D Bio Printer at our San Diego headquarters with our vast array of primary cells is a powerful combination. We're very pleased to offer researchers an end-to-end, customized solution for creating scaffold-free, 3D-engineered tissues that reduce costs by minimizing the lengthy processes typical in pharmaceutical drug discovery."

"The Regenova 3D Bio Printer, combined with Cell Applications' comprehensive, high-quality primary cell bank, offers researchers streamlined access to a nearly limitless selection of three dimensional tissues including those mimicking blood vessels, human neural tissue and liver constructs," said Koji Kuchiishi, CEO, Cyfuse Biomedical. "The collective strengths of both our companies will serve the growing demand for viable engineered tissues and accelerate scientific discovery in North America, taking us one step closer to making regenerative medicine a reality."

Unlike other bioprinters currently available, the Regenova does not depend on scaffolding made of biomaterials such a collagen or hydrogel to construct 3D tissue. Instead, the instrument assembles three-dimensional macroscopic tissue by forming aggregates of cells, called spheroids, one at a time and lancing them onto a fine needle array. Pre-programmed software guides the collection of the spheroids, which can then be designed and constructed into small spheres, rods, sheets, tubes or other tissue configurations. As the engineered tissue fully matures during culture in a bioreactor chamber, the individual spheroids fuse with one another into any desired pattern within a range of approximately 10x10x10 millimeter at 500um resolution. Multiple pieces of bioprinted tissue can then be integrated together to form even larger constructs.

As the cells mature, they self-organize, promoting strong, reliable tissue that is further optimized by the design of the bio printer's needle array that allows for optimum circulation of culture medium. The Kenzan Method, meaning "needle array" in Japanese, is a much gentler approach and greatly increases the percentage of viable cells that survive within the 3D construction, in contrast to bioprinting and scaffolding techniques that utilize high-velocity liquid flow which often damage cells and yield insufficient cell numbers.

Using quality-controlled processes, Cell Applications offers more than one hundred types of human and animal primary cells, with nearly 900 configurations including cells freshly isolated or cryopreserved at early passage, with outstanding viability. Additional primary cell types can be isolated through the company's custom services program. The gentle Kenzan Method favors potentially delicate primary cells, which retain important properties of their original tissue systems without genetic or chemical modification, and are therefore often more physiologically relevant than immortalized cell lines. The company's partnership with Cyfuse Biomedical marks the first placement of the Regenova 3D Bio Printer outside of Japan, where Cyfuse has partnered with research universities to utilize the Kenzan Method.

Researchers at biopharmaceutical companies and academic research institutions have been utilizing or evaluating the Kenzan Method for research projects directed toward creating blood vessels, nerve, and functional liver-like tissues. Other anticipated applications include cardiac muscle and pancreatic islets, as well as spinal cord, urologic, trachea, skin and digestive tissues for regenerative medicine research, drug screening, and other basic researches in the pharmaceutical, biotechnology, cosmeceutical and academic research sectors.

To order custom-printed tissues using the Kenzan Method or to schedule a demonstration of the Regenova Bio Printer at Cell Applications headquarters in San Diego, California, please call 1-800-645-0848 or email info@cellapplications.com.

For information about renting or purchasing the Regenova instrument from Cyfuse Biomedical please contact its North American distributor AMUZA Inc. at 858-225-6869 or sazuma@amuzainc.com.

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About Cell Applications, Inc.
Cell Applications, Inc. is a private company that specializes in primary cells, optimized culture media, reagents and custom-engineered cell and tissue solutions. Within its vast bank, the company holds more than 100 types of primary cells isolated from numerous tissues and species, providing the company's researchers and lab technicians access to nearly 900 configurations for research in the pharmaceutical, biotechnology, cosmeceutical and academic research sectors. Leveraging its custom cell-isolation services, Cell Application can purify, expand, freeze, document and test primary cells isolated from nearly any tissue or species.

Dr. Shinya Yamanaka, of the Frontier Medical Sciences at Kyoto University (Japan), used Cell Applications Human Dermal Fibroblasts in his groundbreaking discovery that mature cells can be reprogrammed to become induced pluripotent stem cells, or iPSC. Dr. Yamanaka's finding was hailed by *TIME Magazine* as the medical breakthrough of the year in 2007 and he was later awarded the Nobel Prize in Physiology or Medicine for the discovery in 2012.

In 2016, the company's headquarters in San Diego, California, became home to the first Regenova® 3D Bio Printer in North America through a partnership with Cyfuse Biomedical of Tokyo, Japan, making scaffold-free bioprinted tissue available in U.S. and Canada. Cell Applications offers comprehensive technical support for all its products and a global distribution network. For more information about Cell Applications call +1-858-453-0848 (international) or 1-800-645-0848 (from U.S. and Canada) or email info@cellapplications.com

About Cyfuse Biomedical
Cyfuse Biomedical, based in Tokyo, Japan, is the developer of the Regenova® 3D Bio Printer and the pioneer of the Kenzan bioprinting method. Recognizing the important role of regenerative medicine as society faces an aging population and an increase of of chronic disease, Cyfuse Biomedical is committed to developing new therapeutic approaches through innovative, bioengineering technologies that will make regenerative medicine a reality.

A "kenzan" is a base of needle-like prongs used to hold stalks of flowers and plants in Ikebana flower arrangements, the traditional Japanese floral art. From this, Cyfuse derived the name of the Kenzan Method, wherein cellular spheroids are skewered onto an array of needles in a pre-arranged design that matures into a three-dimensional, yet scaffold-free, tissue construct.

Cyfuse has partnered with several universities in Japan to utilize the Kenzan Method to construct tissue including blood vessels, cartilage and nerve tissue among others. Recently, the company placed the first Regenova 3D Bio Printer in North America through a partnership with Cell Applications, Inc. of San Diego, California. For more information visit http://www.cyfusebio.com.