

## Invetech delivers first production 'tissue printer' \*UPDATED\*

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**MELBOURNE contract manufacturer Invetech has delivered the world's "first production model 3D bio-printer" to US client Organovo, based on prototypes supplied by the US technology developer.**

According to Organovo, the 3D "bio-printers" allow researchers to build functional blood vessels and organ tissues on a scaffold cell by cell, using an automated, laser-calibrated print head.

The company said its technology was a major milestone on the way to being able to build whole organs.

Organovo chief executive Keith Murphy said in statement yesterday the units represented a breakthrough because "they provide for the first time a flexible technology platform for organisations working on many different types of tissue construction and organ replacement".



Invetech bio-printer  
(Photo: Jack Smith)

"Scientists and engineers can use the 3D bio printers to enable placing cells of almost any type into a desired pattern in 3D," he said.

The production model developed by Invetech fits inside a standard biosafety cabinet for sterile use. It includes two print heads, one for placing human cells, and the other for placing a hydrogel, scaffold, or support matrix.

"Researchers can place liver cells on a preformed scaffold, support kidney cells with a co-printed scaffold, or form adjacent layers of epithelial and stromal soft tissue that grow into a mature tooth," Murphy said.

"Ultimately the idea would be for surgeons to have tissue on demand for various uses, and the best way to do that is get a number of bio-printers into the hands of researchers and give them the ability to make three-dimensional tissues on demand."

Invetech director of biomedical instruments and devices Andreas Knaack told *BTN* the bio-printer is currently able to build tissue structures around 150mm long and potentially up to 1cm or so deep.

He said its primary use will be in regenerative medicine, with the hope being that eventually the machine can build tissue structures such as heart valves or arteries from a patient's own tissues that can be reimplanted without fear of rejection.

According to an article in *Nature* last year, the technology developed by Organovo is different to existing techniques in that it does not rely on placing cells on a pre-existing scaffold.

In late 2007, a team at the University of Missouri created cardiac cells using a prototype Organovo device. After 70 hours those cells fused into tissue, and began beating like regular heart tissue after 90 hours.

Organovo said it selected Invetech as its preferred manufacturer earlier in the year because of the company's proven capabilities in technology development.

Invetech was asked to design and develop a highly integrated, extremely reliable and simple-to-use 3D bio-printer system which could then be transferred to manufacture and commercial sale.

The Australian company was appointed to the project in May, and has taken only six months to deliver the first production model to Organovo.

Knaack said Invetech had a team of six working on the production model across its US and Australian operations.

Invetech said the company planned to ship a number of 3D bio-printers to Organovo in 2010 and 2011 as a part of the instrument development program.

After field testing Organovo plans to supply the units to research institutions investigating human tissue repair and organ replacement.



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