

Researchers devise method for growing 3-D heart tissue

July 17 2013, by Bob Yirka

(Medical Xpress)—Researchers at MIT and Charles Stark Draper Laboratory have developed a method of growing living 3-D tissue using a modified version of a machine normally used to build integrated circuits. In their paper published in the journal *Advanced Materials*, the group describes how they built customized scaffolding that allowed for the growth of functional three dimensional heart tissue—a technique that could one day lead to a means for growing artificial organs.

Up till now, researchers have been able to grow sophisticated tissue in two dimensions and very simple tissues in three. In this new effort, the researchers used technology from the microelectronics industry to build scaffolding that allowed for growth of highly sophisticated [heart tissue](#) in ways that mimic nature.

When growing tissue in three dimensions, a way must be found to cause it to grow in certain ways, rather than as simple blobs—otherwise it won't function as it would naturally. With the heart for example, [fibrous tissue](#) must line up to allow for squeezing in just the right way to force blood through the chambers of the heart. To artificially reproduce such tissue the researchers modified a device that normally allows for stacking thin materials onto circuit boards. In their lab, the machine allows for stacking a flat rubber polymer with holes in it on top of another in such a way as to align the holes in just the right way to cause [heart cells](#) to grow through them into the types of fibers that mimic normal heart tissue—a type known as [anisotropy](#).

Positioning several of the rubber sheets, one on top of another, allowed for the growth of three-dimensional tissue that mimics tissue naturally found in the heart. Once grown, the tissue was found to beat in response to electrical stimulation.

At this point, the heart tissue grown is still too thin to support blood vessels, so further research will have to be done to find a way to make it thicker. In the meantime, the researchers plan to apply some of the newly grown tissue to rat hearts that have been damaged to see if it can help serve as a repair material.

More information: [DOI: 10.1002/adma.201301016](https://doi.org/10.1002/adma.201301016)

© 2013 Phys.org

Citation: Researchers devise method for growing 3-D heart tissue (2013, July 17) retrieved 25 April 2024 from <https://medicalxpress.com/news/2013-07-method-d-heart-tissue.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--