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Microcontainers hold cells captive

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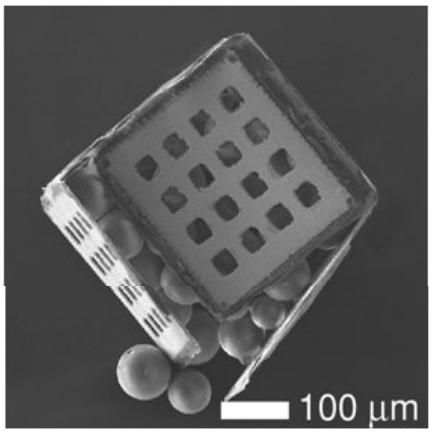
US scientists have made miniature containers that can catch and encapsulate cells.



The template folds into a cube when heated, capturing nearby objects

Microwells in substrates are often used for studying cells but they can only be accessed from the top surface. David Gracias and colleagues from Johns Hopkins University, Baltimore, made 3D porous microcontainers that are accessible from all sides, meaning cells can interact more with surrounding media. 'Life is not 2D so these containers give a more realistic environment when studying biological systems,' explains Gracias.

> **"Life is not 2D so these containers give a more realistic environment when studying biological systems"**
> - David Gracias, Johns Hopkins University, US

Gracias' group made the containers from 2D cruciform templates, each with six faces joined by hinges made from metal and a polymer. They patterned the flat templates with pores using lithography. When they heated the template to 40 degrees Celsius, the polymer softened, causing the hinges to bend. The template folded together into a porous cubic container, capturing inside any nearby objects, such as cells. 'We've shown that the process does not kill cells so it is compatible with live cells and organisms,' says Gracias.

The containers can load themselves with biological objects without the need for microinjection or pipetting. This makes experiments that require slightly different conditions in each container easier and quicker, explains Gracias.

David Beebe, who engineers cellular scale systems at the University of Wisconsin, Madison, US, called the work 'a step forward over previous work by other scientists', adding that it 'extends the functionality and potential applications of engineered microcontainers'.

As well as studying cells and biological systems, Gracias says he hopes the containers could be used for drug delivery, envisaging that the pores could control how much drug is released from the container. The current containers are the right size for cells but if drugs and biologically active molecules are to be encapsulated in the future, Gracias says he will have to make the containers even smaller with very precise pores.

Fay Riordan

Link to journal article

Self-loading lithographically structured microcontainers: 3D patterned, mobile microwells
Timothy G. Leong, Christina L. Randall, Bryan R. Benson, Aasiyeh M. Zarafshar and David H. Gracias, *Lab Chip*, 2008
DOI: 10.1039/b809098j

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