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Chemical Biology

A supplement providing a snapshot of the latest developments in chemical biology



Liver on a chip

07 June 2006

Taiwanese researchers have created artificial liver tissue that could offer hope for transplant patients.

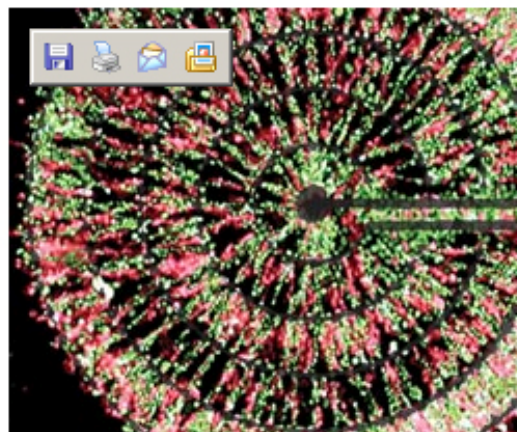
The team, led by Cheng-Hsien Liu at National Tsing Hua University, made a chip that can organise several thousands of cells into complex tissue structures. The chip applies a non-uniform electric field to the cells, which polarises them and causes them to move.

The researchers created artificial liver tissue, using the chip to arrange specialised liver cells (hepatocytes) into chains radiating from a central point.

They then added endothelial cells, cells that line blood vessels in the body, which filled the gaps between the hepatocyte chains.

Liu's artificial tissue mimics the structure of real liver, which is made up of hexagonal units called lobules containing radial hepatocyte chains linked by regions of endothelial cells. Hepatocytes are responsible for many different jobs in the liver, including detoxifying drugs and metabolising cholesterol and fat. The radial structure of lobules is essential for ensuring that blood reaches the hepatocytes and that the liver functions normally. Liu suggests the artificial tissue could eventually be used in transplants and drug testing.

Future challenges facing the group include three-dimensional cell patterning and 'the rebuilding of other complicated living cell blocks of bone, vessel and nerve tissue,' said Liu.



"the proposed approach for generating cell patterning on a surface seems very promising"

Shady Gawad, a researcher in cell manipulation from the University of Southampton, UK, said, 'the proposed approach for generating cell patterning on a surface seems very promising.'

Gawad suggests it could eventually allow scientists to build 'a programmable system to generate different types of tissue geometries' on demand.

Clare E Boothby

References

C-T Ho, R-Z Lin, W-Y Chang, H-Y Chang and C-H Liu, *Lab Chip*, 2006, **6**, 724
DOI: 10.1039/b602036d