Video Article

Interview: Bioreactors and Surfaced-Modified 3D-Scaffolds for Stem Cell Research

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Abstract

A Nature Editorial in 2003 asked the question "Good-bye, flat biology?" What does this question imply? In the past, many in vitro culture systems, mainly monolayer cultures, often suffered from the disadvantage that differentiated primary cells had a relatively short life-span and de-differentiated during culture. As a consequence, most of their organ-specific functions were lost rapidly. Thus, in order to reproduce better conditions for these cells in vitro, modifications and adaptations have been made to conventional monolayer cultures.

The last generation of CellChips -- micro-thermoformed containers -- a specific technology was developed, which offers the additional possibility to modify the whole surface of the 3D formed containers. This allows a surface-patterning on a submicron scale with distinct signalling molecules. Sensors and signal electrodes may be incorporated. Applications range from basic research in cell biology to toxicology and pharmacology. Using biodegradable polymers, clinical applications become a possibility. Furthermore, the last generation of micro-thermoformed chips has been optimized to allow for cheap mass production.

References