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香港城市大學
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Substrate for a Three-dimensional Cell Culture, Its Preparation and Use

Health & Wellness

Manufacturing

Biomedical and Genetic Engineering

Consumer Electronics

Nanotechnology and New Materials

Opportunity

Traditionally, cell cultures have been grown in two-dimensional settings, in which the cell cultures are located on top of a surface. By contrast, in a three-dimensional cell culture, the cells are completely surrounded by another material, providing the cells with a more natural environment. This in turn gives researchers a more accurate way to study cell behaviour. However, most methodologies for producing the matrices in which cell cultures can be embedded are still far from commercialization and usage at scale. For example, the 3D-printing method cannot be easily readjusted for micromanipulation—i.e., for cultivating individual cells. Recently, a process has been developed that involves the electrodeposition of hydrogels as a means of forming the cell culture's matrix. The invention outlined here addresses the limitations faced by other methods of utilizing electrodeposition in the formation of three-dimensional cell cultures.

Technology

The invention involves a significant step forward in cell culture, as it enables three-dimensional cell cultures to be simply produced at scale. First, this invention outlines a methodology for producing and containing a layered material that can serve as the matrix for a three-dimensional cell culture. This matrix involves a substrate that contains transparent layers and a photoconductive layer. As the methodology relies on electrodeposition and not on formation in external molds, it can be employed in a variety of contexts. Since the 3D cell culture industry is rapidly expanding, there are significant benefits to be obtained from utilizing the breakthroughs that this invention outlines.

Advantages

- This methodology can be deployed for micromanipulation purposes, allowing research into single cell behavior.
- This methodology can be adapted to commercial scale.
- This methodology is highly flexible for a variety of mold sizes.

Applications

- Biomedical research

IP Status
Patent granted

Technology Readiness Level (TRL) ? 4

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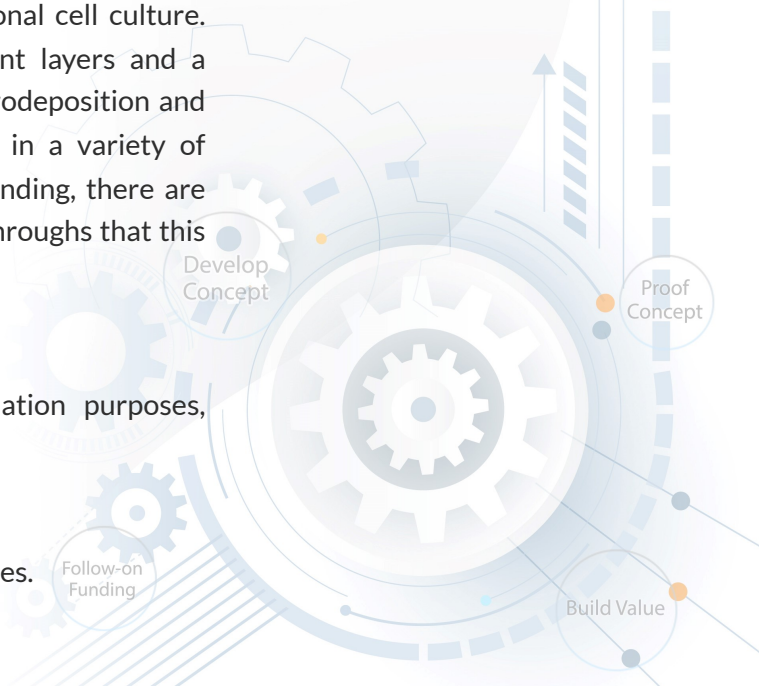

- Pharmaceutical research
- Hospitals and diagnostic centers
- Oncological research