

Video Article

BioMEMS and Cellular Biology: Perspectives and Applications

Albert Folch¹

¹Department of Biomedical Engineering, University of Washington

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Abstract

The ability to culture cells has revolutionized hypothesis testing in basic cell and molecular biology research. It has become a standard methodology in drug screening, toxicology, and clinical assays, and is increasingly used in regenerative medicine. However, the traditional cell culture methodology essentially consisting of the immersion of a large population of cells in a homogeneous fluid medium and on a homogeneous flat substrate has become increasingly limiting both from a fundamental and practical perspective. Microfabrication technologies have enabled researchers to design, with micrometer control, the biochemical composition and topology of the substrate, and the medium composition, as well as the neighboring cell type in the surrounding cellular microenvironment. Additionally, microtechnology is conceptually well-suited for the development of fast, low-cost in vitro systems that allow for high-throughput culturing and analysis of cells under large numbers of conditions. In this interview, Albert Folch explains these limitations, how they can be overcome with soft lithography and microfluidics, and describes some relevant examples of research in his lab and future directions.

Video Link

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