Special Issue

Microengineering Techniques for Disease Modeling and Drug Discovery

Message from the Guest Editors

Microengineering approaches are enabling technologies for creating biomimetic cell culture systems that recapitulate the cell-cell and cell-tissue interactions, as well as, spatiotemporal chemical gradients, and dynamic mechanical microenvironments in living organs. These bioengineered systems offer unique opportunities for disease modeling and drug discovery due to their ability to promote cellular and tissue organizations which were not possible in conventional monolayer culture systems. The current Special Issue aims to address recent advances in the fabrication and operation of microengineered tissue culture platforms with particular emphasis on microfabricated tissues, single- or multi-organ-on-chip devices, 3D bioprinted tissue models, and multicellular spheroids. The interface of these systems with genomics, metabolomics, and proteomics for the better understanding of disease formation and progression is also of great interest. Moreover, we encourage manuscripts on the development of sensors for long-term monitoring of cellular microenvironments and studies reporting high-throughput designs for investigating the toxicity of drugs and their metabolites.

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