

Microfabrication technologies for new biomimetic in vitro systems

In vitro assays are recently shifting from the use of 2D cell monolayers to the use of organotypic, 3D cell cultures, as it is becoming increasingly evident that the “flat biology” approach is not predictive of *in vivo* tissue responses. Our research aims to further accelerate this trend by providing new cell culture platforms that account for the structural, physiological and biochemical features of the *in vivo* cellular microenvironment. Specifically, we develop systems that mimic the 3D morphology, the spatio-chemical gradients and the dynamic microenvironment of the living tissue. For this purpose, we use a combination of micro and nanofabrication technologies and tissue engineering components. These biomimetic systems will provide the interface between biomedical questions and engineering tools to (i) develop new insights into environmental regulation of cells, (ii) model and investigate diseases, and (iii) develop new therapies for regenerative medicine.