

Cell encapsulation and growth in soft hollow spheres:

Abstract:

One of the main challenges of modern quantitative cell biology is to go beyond 2D cell culture in Petri dish and engineer controlled 3D cellular environments. We propose a new material-science approach to perform 3D cell culture and to uniquely investigate some unexplored properties related to 3D cell growth. Our original concept is based on the design of 100 μm -sized soft, transparent and permeable hollow spherical capsules made of hydrogel and on the microfluidics-assisted encapsulation of cells. A biotechnological aspect of the project consists in developing a simple, reproducible and large-scale method for producing model 3D cellular environments. We have achieved a proof of concept and we were able to monitor the growth of cells in capsule using various microscopy techniques.