Microfluidic devices for cell culture and analysis

« Microtechnologies and microfluidics have shown considerable promise for improving the fields of biomedical science and clinical diagnostics. After undergoing its own development and establishment as a technology over past years, microfluidics is now being increasingly applied to areas such as biomarker analysis where it has the potential to transform the field. It offers the possibility to select, manipulate, stimulate, individual cells or even molecules, in a highly parallelized and automated manner. It thus provides all the basic functions that are required to perform the complex analytical workflows leading to biomarker detection and quantitation. In this talk, I will first show three examples of bio-analytical applications that we recently developed for i) the integration of functionalized 3D structures for protein detection and capture of rare cancerous cells ii) the generation of a miniaturized fluidized bed for bio molecular pre-concentration iii) the use of droplet microfluidics for multiplexed heterogeneous immuno-assays and transcriptomic analysis through RT PCR. I will finally introduce some technological developments that have been recently started at LAAS CNRS on the development of 3D printing technologies for the fabrication of 3D microfluidic devices and scaffolds recapitulating some topological and physical properties of cell microenvironment. »

References :


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