

Microfluidic Tools for Novel Cell Applications

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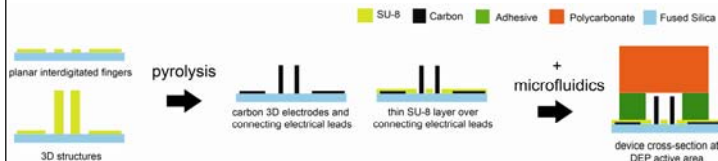


Here we demonstrate the development of two microfluidic platforms to facilitate single cell analysis

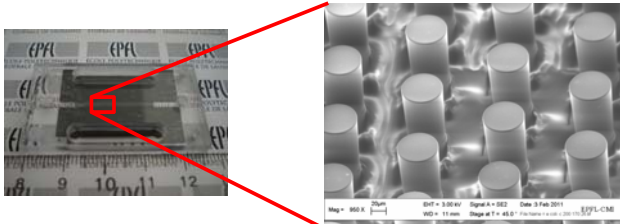
HIGH THROUGHPUT ENRICHMENT

In collaboration with François Huber, Hans Peter Lang and the team at UniBasel, we developed a device based on 3D carbon electrodes to allow high throughput enrichment of a cell population. This population is then directly fed to a cantilever-based device for detection and analysis of single cells.

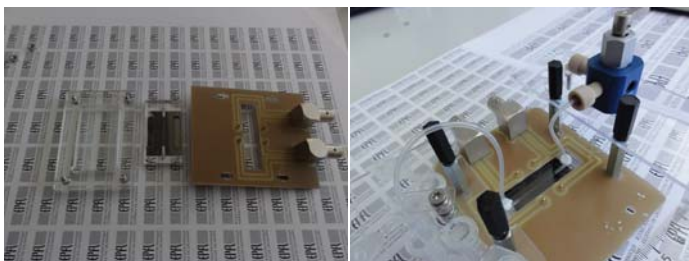
Electrode Fabrication



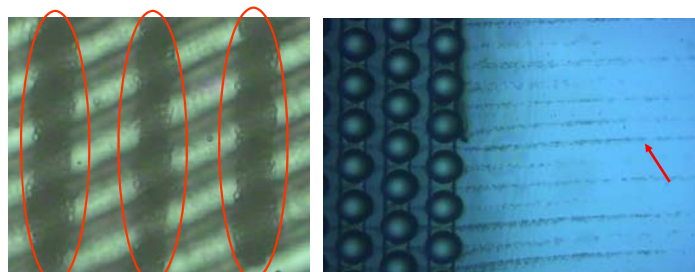
Experimental Device



User-friendly experimental platform



Preliminary results

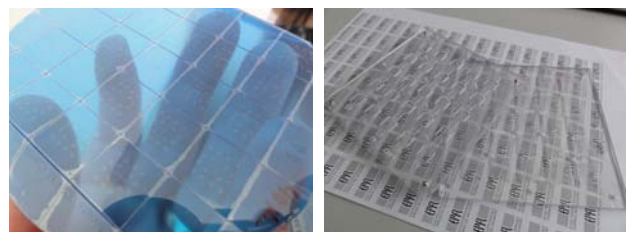
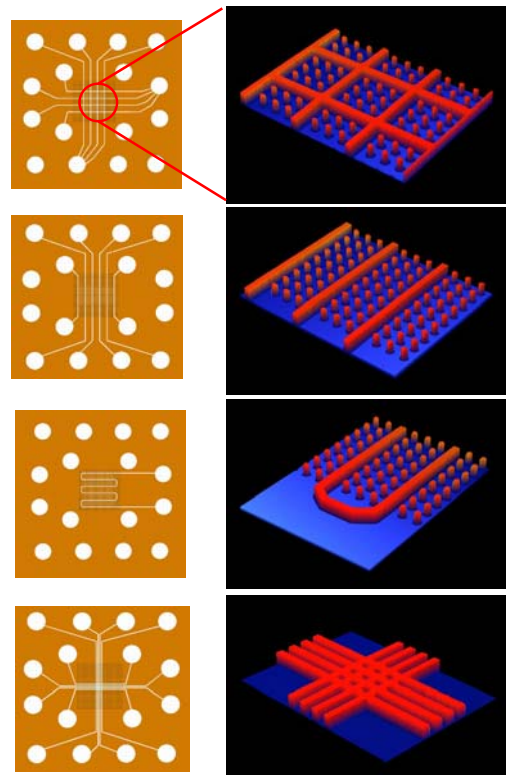


Viable yeast cells trapped in pDEP regions around the carbon electrodes (red ellipses).

Elution of yeast cells (red arrow) previously trapped in pDEP regions around the carbon electrodes. The cells start to flow away as soon as the electric field is turned off.

MULTIPLEXED CHANNELS

In collaboration with André Meister at CSEM, a platform for the fabrication of multiplexed channel arrays has been developed. Molds are made in SU-8 and introduced in a molding tool for subsequent fabrication of PDMS-based microfluidic devices. 25 microfluidic pieces can be fabricated in a single run. These pieces are expected to be interfaced to a Cytos® chip for the study and retrieval of single cells. 4 different designs have been fabricated:



SU-8 molds

Molding tool