Seminarankündigung

Dienstag, 20. Juni 2017
17:15 Uhr

WSI, Seminarraum S 101

“New enabling technologies for high-throughput lab-on-a-chip devices”

The field of miniaturized systems for molecular and cellular analytics has been stirred all through the last couple of decades by the discovery of new ways to control the movement of fluids and particles in a very precise way, as well as by novel surface treatments and molecular separation techniques. Those developments have been so far intimately connected to the use of materials issued of fast prototyping, (such as elastomers, like PDMS) and cloth-like or fiber-based materials such as paper. If these frameworks are already limiting the uptake of low complexity solutions (i.e. a few detection sites or number of channels), they represent serious roadblocks for the scalability of these analytical techniques to high-throughput systems.

In order to achieve high-density integrated systems for molecular analytics, manipulation of bioparticles and characterization of biological samples at different scales, monolithic fabrication is essential and should be pushed as far as possible to produce incremented density of segregation features and sensing sites, as a result of the alignment of the different chip layers with photolithographic precision. The development of technologies based on silicon, glass and high aspect-ratio photoresists with sufficient thermal and chemical stability and compatible with batch processing are of key importance for the scalability of these systems. In this talk we will describe our contribution to the integration of biosensors on IC layers and to solve the issues related to the specific surface treatments involved in the analytical protocol. Moreover, we will discuss (i) our recent achievements in the field silicon nano-sized devices for ultimate pH sensitivity and their application in nucleic-acid assays and (ii) the applications of a novel technology for microfluidics-integrated electrodes that enable a new generation of label-free flow cytometers.

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