

Fabrication of micro-fluidic systems

During the past years, lab-on-a-chip devices have become an important tool with a huge number of applications within for example biochemistry and medicine. They can be used for on-site detection and analysis of for example contamination in food or of blood samples for medical diagnosis. The lab-on-a-chip concept involves a complete system for handling and analyzing a small volume of a liquid sample. An important aspect is the ability to control the flow of the sample to the detection system. This can be done by designing and constructing a micro-fluidic device, which can include a main flow channel and two so-called focussing or sheath channels that focus the flow in the main channels to enable single-cell analysis. An example of such a system is shown in fig. 1.





Figure 1: Micro-fluidic system for flow focussing.

In the NanoSYD research group in Alsion/SDU in Sønderborg, we are working with various kinds of nano- and microstructures, combined with advanced optics, as for example laser-spectroscopy. In this context, fabrication of microfluidic devices, which could act as a sample platform in a larger spectroscopic setup, is of great importance. The microfluidic device should then be able to support various kinds of liquids, containing different species to be analyzed.

In this project, you will design and fabricate a micro-fluidic device using different microfabrication techniques. The micro-fluidic device should be designed in such a way that it can be flushed with various samples containing different samples to be analyzed. The actual fabrication of micro-fluidic devices will be done in the cleanroom at Alsion.

Supervisors:

Casper Kunstmann-Olsen & Jakob Kjelstrup-Hansen

Contact:

Jakob Kjelstrup-Hansen jkh@mci.sdu.dk



Mads Clausen Institute, SDU - Alsion 2 - 6400 Sønderborg, Denmark