Details

Microfluidics Core Facility (µFlu CF)

Within the newly established and sole Microfluidics Core Facility at University Heidelberg and surrounding (e.g.: EMBL, DKFZ, MPI), we support research groups in setting up and running microfluidic experiments. Microfluidic describes the study of liquids and gases in small channels. The versatility of the chips allows them to be a useful tool for multiple disciplines, such as medicine, biophysics, chemistry and many more. We focus on the fabrication of microfluidic chips, which involves the entire process, starting from the general chip design to the production of the custom tailored device. Besides the Microfabrication, we support the users with knowledge in conducting the experiments and introducing the users to standard microfluidic technologies. Given the infrastructure of the user's lab and the experimental application of the chip, the experiments are either conducted at the user's laboratory or, after an introduction to the microfluidic set up, at the microfluidic core facility. Since we are a very project oriented core facility, there are many discussions with the users through the process, leading to chip alterations or follow up projects after initial results.

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To website

Host Institution

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https://www.imseam.uni-heidelberg.de

Scientific Domain

Primary Subjects:
- Biology
- Medicine
- Materials Science and Engineering

Secondary Subjects:
- Chemistry
- Physics

Category

Micro- and Nanotechnology facilities

Scientific Services

Several techniques are being employed at the microfluidic core facility to deliver high quality microfluidic chips for the users. To ensure a satisfying outcome for the users, we first set up a general meeting to discuss the final goal of the project and the necessary design of the chip. Based on the requirements and specifications the chip has to meet, the chips are either prepared with standard lithography or 3D printing by the staff of the facility. By using a spin coater, the photoresist is first distributed on a suitable substrate at the height of choice. With the mask-less Aligner the design is exposed into the photoresist and developed. With a profilometer the final height of the chip is being determined. The final product is handed to the user for microfluidic experiments. The facility also owns a 3D printer to generate more complex microfluidic devices. Users can also book a microfluidic set up to conduct their experiments at the facility. The set up consist of a light microscope with 3 fluorescent filter cubes, a high speed camera, a pressure-based flow controller and 4 syringe pumps. Besides conventional Microfluidics we also offer support, by means of knowledge and equipment, to generate water-in-oil emulsion off-chip, synthetic cells or glass-capillary based microfluidic systems.

Scientific Equipment

- Mask-less Aligner
- 3D printer
- Spincoater
- Cutter plotter
- High speed camera
- Syringe pumps
- Pressure-based Flowsystems
- Light microscopes
- Profilometer
- Laser Cutter
- Emulsifier

Keywords

- Droplet-based microfluidics
- Continuous flow microfluidics
- Organ-on-Chip Technologies
- Real-time deformation cytometry
- Glass capillary microfluidics
- Small scale DLP 3D Printing
- Synthetic cell production
- Lipidnanoparticle production

Networks

Health + Life Science Alliance Heidelberg Mannheim
https://www.health-life-sciences.de/?lang=de

Users per annum

Internal Users: 13
External Users in total: 33
External Users: 31
External Users in the EU: 0
External Users outside of EU: 2