



Wednesday, November 22, 14:30-15:30
Physics Department H-Block Seminar Hall (Tea & coffee at 14:15)



Microfluidic Systems for Disease Detection and Organ-on-Chip Applications

Microfluidic devices with microchannels and microstructures produced by lithography are used for many applications such as biological and chemical reactions, sensors, drug research, disease diagnosis and mimicking human organs [1]. In particular, traditional animal experiments for preclinical screening in the drug discovery process have many challenges. Fortunately, experiments using human-derived cells in microfluidic devices minimize these difficulties. [2]. For this purpose, many studies are carried out to produce microfluidic-based organs-on-a-chip to mimic human organs such as kidney, lung, vessel, liver, heart, intestine and pancreas. Even more complicated systems consist of combination of different organs have been studied. This allows to reduce the required time for the process of drug discovery and to carry out patient-specific tests [3]. In this talk, I will give brief information about lithography-based microfluidic chip production and talk about common applications of microfluidic systems such as botox detection, blood analysis, sperm separation. I will also mention our ongoing research on organ-on-a-chip platforms such as the lung-on-a-chip, the blood-brain barrier, and the cardiovascular system.

Related publications

- [1] D. Huh *et al.*, Nature Protocols, 8, 2135-2157 (2013).
- [2] K. Hiroshi *et al.*, Drug Metabolism and Pharmacokinetics 33, 43-48 (2018).
- [3] H. Avci, *et al.*, Turkish Journal of Chemistry 42 (3), 587-610 (2018).



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