

ICB PhD public presentations**MICROFLUIDICS FOR HIGH-THROUGHPUT ANALYSIS OF CELLS AND EXTRACELLULAR VESICLES****Yingchao Meng**

ICB / The deMello group

Supervisor: Prof. Dr. Andrew deMello

Co-examiners: Prof. Dr. Inge Herrmann and Dr. Stavros Stavrakis

**03/11/2023, 12:00 h****ETH Hönggerberg, HCI J 6 and on Zoom**<https://ethz.zoom.us/j/66946552479>

Project Summary: In recent years, circulating tumour cells (CTCs), extracellular vesicles (EVs), and cell free nucleic acids, have emerged as promising biomarkers for cancer liquid biopsies. However, clinical evaluation of liquid biopsies is extremely challenging due to the difficulties in isolating and detecting these rare cancer-associated biomarkers from complex body fluids. Microfluidics have emerged as a powerful tool for analysing these circulating tumour biomarkers. We have developed a range of microfluidic platforms able to manipulate and process cells (e.g. CTCs) and EVs (specifically small EVs, sEVs) for liquid biopsy applications. We have developed a sheathless optofluidic imaging flow cytometer that incorporates microfabricated mirrors for high-throughput multi-parametric cell imaging. We have also realised a microfluidic fluorescence-activated cell sorter specifically designed for the isolation of CTCs from blood. Subsequently, we developed a viscoelastic microfluidic device for label-free isolation of sEVs from blood. Finally, we have fabricated and tested a monolithic plasmofluidic device that integrates viscoelastic separation with surface plasmon resonance analysis for the direct isolation and detection of sEVs from plasma.

CV. Yingchao received his B.Eng. in Thermal Energy and Power Engineering from Harbin Institute of Technology (Harbin, China) in 2016. Afterwards, he obtained his M.Sc. in Nuclear Science and Technology from Tsinghua University (Beijing, China) in 2018. In September 2018, he joined Prof. deMello's group in the Institute of Chemical and Bioengineering at ETH Zurich as a Ph.D. student.