

Thin-film transistor-based active-matrix digital microfluidics



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University of Electronic Science and Technology
of China

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Hosted by: Prof. Songnan QU

Abstract

Electrowetting-on-dielectric as a liquid sample handling platform has been widely used in digital microfluidic systems for miniaturizing bio-laboratory processes. Droplet manipulations are enabled by programmable electrodes control. Active-matrix technology overcomes the scalability limits of passive electrode arrays by embedding transistors to each pixel, enabling high-throughput control over droplets across large-area arrays. In this talk, I will introduce the importance and development of digital microfluidics. I will present results on thin-film transistor-based active-matrix digital microfluidics platforms, and its broad applications on life sciences research. Future prospects of active-matrix digital microfluidics will be discussed.

Biography

Prof. Hanbin MA, Professor at University of Electronic Science and Technology of China. He is the founder of ACX instruments, which was spun out from the University of Cambridge and the Chinese Academy of Sciences in the Cambridge Science Park, UK in 2016.

Prof. Ma received his PhD degree in Engineering from University of Cambridge, UK. From 2014 to 2018, he was supported by Isaac Newton Trust and other projects at the University of Cambridge as a Research Fellow. From 2018 to 2025, he worked at the Chinese Academy of Sciences as a Hundred Talent Professor in CAS Key Laboratory of Bio-Medical Diagnostics, Suzhou Institute of Biomedical Engineering and Technology. He then moved to University of Electronic Science and Technology and Sichuan Provincial People's Hospital. He has authored or co-authored more than 80 peer-reviewed articles. He holds more than 50 awarded and pending patents. His current research is focused on large-area electronics-based biosensing systems and active-matrix biochips.