

Innovative Microfluidic Platforms: From Viscoelastic Fluid Dynamics to Advanced Biosensing

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Time: 2:30 pm - 3:30 pm



Venue: HKIAS Lecture Theatre,

LG/F, Academic Exchange Building, City University of Hong Kong

Registration

<https://cityuhk.questionpro.com/t/AaxdQZ48ov>



Abstract : Microfluidics revolutionizes small-scale fluid manipulation, offering precise control and visualization of complex flow dynamics. It provides transformative solutions in biophysics, biotechnology, and healthcare by integrating advanced fabrication and sensing technologies. This talk highlights recent developments in microfluidic platforms, showcasing their versatility in investigating viscoelastic fluid instabilities and enhancing biosensing for diagnostics and personalized healthcare.

- 1. Exploring Viscoelastic Instabilities with Microfluidics:** Using selective laser-induced etching (SLE), we developed glass microfluidic devices for real-time visualization of 3D viscoelastic fluid instabilities. These devices reveal fluid-structure interactions and chaotic flow behaviors, providing insights for industry and biology.
- 2. Microfluidic Biosensing for Precision Diagnostics:** Our optomicrofluidic device detects SARS-CoV-2 antibodies in plasma within 30 minutes. Complementary electrochemical immunosensors distinguish infection-induced from vaccine-induced antibodies in under 7 minutes. We also developed platforms for prostate cancer biomarker detection and selective bacterial sensing, offering scalable, non-invasive solutions for diagnostics and health monitoring.

Biography: Amy Shen is the Provost and a Professor at OIST in Japan, leading the Micro/Bio/Nanofluidics Unit since 2014. Previously, she was a Mechanical Engineering faculty member at the University of Washington, USA. Her research focuses on microfluidics, rheology, and lab-on-a-chip technologies. Amy is a Fellow of the American Physical Society, the Royal Society of Chemistry, and the Society of Rheology. She has received numerous awards, including the NSF CAREER Award and was a Fulbright Scholar in 2013. She serves as an Associate Editor for Soft Matter and is on the editorial boards of several scientific journals.

