

## Organoid on Chip Toward Precision Medicine



### Professor LIU Yaling

Distinguished Professor

Deputy Director of the Precision Medicine Translational Research Center at West China Hospital, Sichuan University

Director of the Organoid on Chip and Organoid Platform at the National Industrial Innovation Center of Precision Medicine

Date : 30 April 2025 (Wednesday)  
Time : 2:30pm  
Venue : Room 1122, William M W Mong Engineering Building, CUHK

### **Abstract**

Accurate diagnosis and personalized treatment planning are critical for effective disease prevention and therapy. This talk will present recent advances in disease characterization and drug testing using patient-derived organoids, organ-on-chip technologies, and intelligent image analysis. We have developed a series of microfluidic testing platforms that mimic vascular and tumor microenvironments to study the biotransport behavior of drug carriers and cells. One such device features a hierarchical vascular network, from meso- to capillary scale, self-assembled within a chip to replicate the dynamics of vascularized tumors and enable the study of metastasis and drug response of vascularized tumors. We have also established a bank of lung carcinoma organoids, performed drug sensitivity testing and correlated with clinical data. Functional imaging and multiplex machine learning approaches are used to classify and sort cells and organoids across multiple modalities. The talk will conclude with a discussion on how high throughput organoid culturing, multimodal machine learning, and personalized drug screening can contribute to the future of precision medicine.

### **Biography**

Yaling Liu is a Distinguished Professor, the Deputy Director of the Precision Medicine Translational Research Center at West China Hospital, Sichuan University, and Director of the Organoid on Chip and Organoid Platform at the National Industrial Innovation Center of Precision Medicine. Dr. Liu receives his B.S. degree from Tsinghua University, and M.S and Ph.D. degrees in Mechanical Engineering from Northwestern University. Dr. Liu is a Fellow of AIMBE and ASME, senior member of National Academy of Inventors, recipient of NSF CAREER Award and Interdisciplinary Research Excellence Award. He is an Associate Editor of Frontiers in Bioengineering and Biotechnology. He is a member of the Executive Committee of ASME Bioengineering Division and is the Vice-president of Chinese Biopharmaceutical Association Greater Philadelphia Chapter. His research interests include: Organ-on-Chip, Organoid, microfluidics, nanomedicine, biosensing, biofabrication, precision medicine, and machine learning.

\*\*\* ALL ARE WELCOME \*\*\*

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