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SEMINAR

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13:15 – 14:15 @ Bldg. C3 Lecture room 3 (b1S02) & ZOOM

The multi-functional microfluidic platforms for personalized medicine and healthcare

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Abstract:

In this talk, I will briefly introduce various multi-functional microfluidic platforms to enable on-chip clinical sample preparation and in-situ cellular phenotype analysis or biomarkers detection. These microfluidic platforms were operated by the automated microfluidic flow control system, including micro-pumps, micro-valves, and reservoirs, to guide and switch different reagents into the system automatically, which can prevent any potential sample contamination, loss and reduce any manipulation error. Besides, the microfluidic platforms integrated with electrical, surface-enhanced Raman spectroscopy (SERS), nanoplasmonic, and magnetic sensors to perform precise cell manipulation followed by real-time molecular sensing, which can be applied for various personalized medicine and healthcare applications, including genetic screening, whole blood analysis or infection disease diagnosis.

Brief Biosketch:

Prof. Nien-Tsu Huang received his Ph.D. degree in Mechanical Engineering at the University of Michigan, Ann Arbor, in 2012. He then joined the Graduate Institute of Biomedical Electronics and Bioinformatics and the Department of Electrical Engineering at National Taiwan University (NTU) in 2013. He also holds a joint appointment as a chief director in Biomedical Technology and Device Research Laboratories at Industrial Technology Research Institute (ITRI) in 2023. His research focuses on developing integrated microfluidics for whole blood processing and in-situ analyte detection, optofluidics for on-chip cellular manipulation and detection, single-cell



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analysis, optical and electrical-based biosensor. He was selected as the Lab on a Chip Emerging Investigator in 2016 and National Science and Technology Council (NSTC) visiting scholar in University of Freiburg in 2024.

Hosted by: Ryuji Yokokawa (yokokawa.ryuji.8c@kyoto-u.ac.jp), Dept. of Micro Engineering, Kyoto University.