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Friday, October 7th, 2022 | 9:00 AM | EC 2300

The Development of Nanotechnology Enabled New Tools for Precision Medicine

ABSTRACT: The Precision (personalized) medicine is a paradigm shift and provides exciting new opportunities for biomedical research. A lot of exciting new approaches of this field, such as DNA sequencing, wearable and portable sensors, organ-on-chip devices, have been benefited from the rapid developments in nanoscience and nanotechnology. In this talk, I would like to share my research journey and the recent research progress in this field. Originated from the nanopore based DNA sequencing project, we have developed the multifunctional nanopipette with both amperometric and potentiometric methods for biomolecule analysis and detection at the single-molecule level.

The nanopipette has also been precisely manipulated by scanning probe microscopy and micro/nano manipulator for live cell/tissue imaging, quantitative intracellular delivery, intracellular single-molecule detection and nanoelectrophysiology. In another project, we developed engineered cardiac tissues. By introducing nanomaterials such as nanoparticles in the extracellular matrix, the engineered cardiac tissues show prolonged lifetime and greatly improved maturation. We also used nanopipette based techniques to study the maturation process of these tissues.



Through the generous support of the Wallace H. Coulter Foundation, the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to provide a research seminar and to meet with faculty and students to discuss the latest developments and research in Biomedical Engineering.

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