BioMEMS

Co-Chairs: Dean Ho, Professor, University of California, Los Angeles
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Emerging challenges in diagnostic medicine include the need for rapid, sensitive, and specific detection strategies that are integrated with robust sample processing and analysis capabilities. These attributes are becoming increasingly important towards applications such as circulating tumor cell detection, cancer diagnosis, cellular interrogation, and drug screening and discovery, among other domains. The development of advanced therapeutic delivery systems has realized reduced burst release, stimuli-responsive drug elution, and multi-drug delivery, among other properties. A major foundation for the fruition of these technologies involves the use of fabrication approaches and materials that are conducive towards clinical translation and broad impact towards patients. To address the increasing demands required for improving health care outcomes through advances in the laboratory, this session will highlight the translation of innovation from fundamental engineering towards clinical realization.

Specific topics addressed in this session will include: The application of scalable micro/nano-structured interfaces towards enhanced drug delivery efficacy and safety; Comprehensive single cell resolution analysis of dynamic cellular activity using microfluidic devices; The translational development of point-of-care clinical diagnostic platforms for multi-agent detection; and the fabrication of highly conformal and stretchable electrode array platforms for the measurement of cellular electrical activity. Epicardial and intracranial recording, improved transdermal and ocular drug delivery, label-free dynamic imaging, and rapid, sensitive, and specific bacterial infection diagnosis represent a snapshot of the spectrum of medical needs that can be addressed by the technologies highlighted in this session.

Our invited speakers will provide timely insight into recent multi-disciplinary breakthroughs that demonstrate the bridging of the application of novel micro/nanofluidic and nanomaterial platforms for drug delivery, nucleic acid analysis and cellular interrogation, with the requisite integration processes that have led to clinical validation and commercialization.

Speakers:

Tejal Desai, Ph.D., Professor, UC San Francisco
Topic: Micro and Nanostructured Interfaces for Overcoming Drug Delivery Barriers

Yanyi Huang, Ph.D., College of Engineering, Peking University
Topic: Quantitatively Study the Dynamic Behavior of Cells Through Microfluidic Devices at Single Cell Resolution.

Vincent Gau, Ph.D., President, CEO, and CTO, Genefluidics, CA
Topic: Translational Development of Clinical Diagnostic Platforms

Zhe Yu, Ph.D., Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences
Topic: Highly-Compliant, Conformal, and Stretchable Microelectrode Arrays