The Chinese University of Hong Kong
Department of Biomedical Engineering

Precise Molecular Diagnostics by Functional Biological Nanopore

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Abstract

To address the key scientific and technical issues for the precise sensing and analysis of proteins and small molecules, our research team constructed various modified biological nanopore channels, enabling the direct distinction of all natural amino acids, and validated a real-time peptide sequencing method using nanopore exonucleases. Additionally, we investigated small conductive mechanical sensitive channels for the direct detection and rapid quantification of small molecular drugs. This led to the development of a continuous monitoring system for drug concentration in live blood based on ultra-narrow nanopores, providing a technical route for rapid, real-time, and convenient testing for clinical drug use, as well as a new approach for continuous monitoring of live biological systems at the single-molecule level.

Biography

Dr. Jia Geng received his B.S. in chemistry from Nanjing University in 2004 and Ph.D. in biomedical engineering from University of Cincinnati in 2012. He was a postdoctoral scholar at Lawrence Berkeley National Laboratory before joining West China School of Medicine, Sichuan University in 2015. He is currently Yangtze Scholar Distinguished Professor and Deputy Director of the Clinical Laboratory Medicine Research Center. His research focuses on single-molecule biophysics, controllable nanoscale transport of soft materials, and the development of nanopore-based molecular biosensing and protein sequencing techniques for clinical diagnostics. He has published more than 60 peer-reviewed papers, including publications in *Nature*, *Nature Methods* et al. Dr. Geng is a recipient of the Physical and Life Sciences Directorate Award from the Lawrence Livermore National Laboratory.

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

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