Title:
Exploiting complex biology and diseases at a single cell/molecule level using droplet microfluidic technologies

Abstract

Genetic and functional heterogeneity at the cellular and molecular level presents major obstacles to effectively exploit complex biology and to early diagnose and treat diseases including cancer and infectious diseases. In this talk, I will present examples of emerging droplet microfluidic technologies that offer advantages in analyzing single molecules and single cells with exceptionally high throughput and sensitivity. In particular, I will discuss a new Integrated Comprehensive Droplet Digital Detection (IC 3D) Technology that enables rapid and sensitive analysis and detection of biomarkers that exist at extremely low abundance (<100 biomarkers/mL) in complex biological media. The IC 3D technology will potentially find great utility in both basic research and disease diagnosis.