



At 4 PM on 27th August 2018 (Monday)
MRDG seminar hall, 1st Floor Biological Sciences Building

Microdroplets for single cell and single molecule analysis

**Prof. Rahul Roy,
Chemical Engineering, IISc**

Abstract

Heterogeneity among cell and biomolecules is a well known observation that underlines the complexity in biology. Conventional techniques that probe single molecules or single cells have remained largely restricted to prior tagging and imaging based approaches. I will present how microfluidics based microdroplet technologies are changing this by enabling high-throughput single molecule and single cell analysis. Aqueous microdroplets (~ 1 picoliter in volume) in immiscible fluids can be generated in microfluidic devices with high precision and reproducibility. Various unit operations with these microdroplets can achieve similar level of complexity as in test-tube based open systems and thus enabling truly Lab-on-Chip capabilities. I will discuss a few recent platforms from our lab that are enabled by these microdroplet based devices: a) droplet digital Nucleic Acid Quantification platform, b) continuous flow single cell gene expression analysis and c) cell-in-droplet detection using fusible microelectrodes

About the Speakers

Rahul Roy received his PhD in Biophysics and Computational Biology from University of Illinois, Urbana-Champaign. After a post-doctoral stint at Harvard University, Rahul joined Chemical Engineering Department at the Indian Institute of Science as an Assistant Professor in 2012. His lab is leading an interdisciplinary research program aimed at innovating and engineering novel technologies to help understand and manage infectious diseases using single molecule detection, quantitative genomics and high resolution imaging

