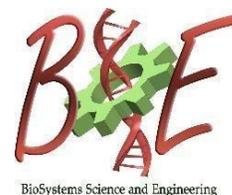




Indian Institute of Science
Centre for BioSystems Science and Engineering

BSSE & MRDG Seminar

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Biological Sciences Building



BioSystems Science and Engineering

Hybrid live cell—supported membrane interfaces for cadherin adhesion and signaling

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ABSTRACT

A wide range of cell-microenvironmental signaling is mediated by membranelocalized receptors that bind ligands present on another cell or the extracellular matrix. The presence of receptor-ligand complexes on surfaces introduces a number of physical effects including their spatial organization and development of mechanical forces in the cells, features that could not be readily interrogated using traditional experimental approaches. The hybrid live cell—supported lipid bilayer (SLB) system, wherein a live cell interacts with a synthetic supported membrane, on the other hand, allows such interrogation. The SLB system directly offers a facile control over the identity, density and mobility of ligands used for engaging cellular receptors. Further, fabrication of various nano- and micropatterns on the substrate allows spatial control over the signaling complexes. In this talk, I shall describe the hybrid live cell—SLB system, and its utility in the discovery of regulatory features in cadherin adhesion and signalling such as nucleation and clustering, and its impact on other signaling systems.

ABOUT THE SPEAKER:

Dr. Kabir H Biswas obtained his Masters and PhD in 2007 and 2011, respectively, as a part of the prestigious Integrated PhD program at the Indian Institute of Science, India. As an Integrated PhD student, he was focused on understanding mechanisms of allosteric regulation in signaling proteins, in addition to designing a number of highly specific, genetically encoded sensors for the purpose of recording intracellular signaling events. Following PhD, he moved to Singapore in 2011 as a Research Fellow at the Mechanobiology Institute (MBI), National University of Singapore (NUS). In Singapore, he was primarily involved in (i) engineering nano- and micropatterned, membrane-based biointerfaces to control cellular adhesion and signaling, which enabled fundamental discoveries related to the mechanism of cellular adhesion and mechanical signaling transduction, and (ii) developing novel imaging strategies directed toward biophysical studies and remote site diagnostic assay platform. Dr. Biswas has been an Assistant Professor at CHLS/HBKU since February 2019.