



Centre for Biosystems Science and Engineering Seminar

Curvature remodelling of cell membranes and its implications in targeted drug delivery

by

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11:00 AM, MRDG Seminar Hall, Biological Sciences Building.

Emerging experimental evidences are pointing to the role of the cell membrane as a signalosome, i.e., a unit that governs cell function through soft signals originating from subtle/drastic modulations in the membrane curvature. In this context, understanding the various mechanisms that regulate cell membrane curvature is essential to build predictive models for many cellular pathologies.

The first part of the talk will focus on the multiscale computational aspects of protein-mediated remodelling of cell membranes and show how complex cellular morphologies and curvature gradients may emerge due to the interplay between lateral organization of proteins and membrane biomechanics.

The second part, will focus on how the intrinsic state (i.e., the local curvature) of the target cell membrane is one of the key factors that determine the efficacy of a functionalized nanocarrier used in targeted drug delivery. The speaker will also describe a biophysics based multiscale computational platform that may be used as a tool for rational design and optimization of functionalized nanocarriers.

About the speaker

Dr. Ramakrishnan Natesan obtained his Masters degree in theoretical physics from the University of Madras in 2005. He graduated with a PhD in physics from IIT Madras in 2012, specialising in the areas of computational physics and soft condensed matter. He is presently a postdoctoral fellow in the department of Bioengineering at the University of Pennsylvania. He is a recipient of the DBT-Ramalingaswami fellowship for the year 2015-2016. Dr. Natesan's research interest are broadly in the areas of computational biology, membrane biophysics, structure of chromatin, targeted drug delivery, cellular adhesion, fluid mechanics, and systems biology.