Centre for Biosystems Science and Engineering

S E M I N A R

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Seminar Hall, MRDG, Biological Sciences

Leading Pathogens to the Death chamber : A Kinder face of Cholesterol

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Many biological processes require the generation of force inside cells of your body. The unit generator of force that often drives biological movement is a nanoscale molecule called a Motor protein. We have used optical trapping to measure the force exerted when Motors carry bacteria towards acidic compartments in the cell, so that the bacteria can be killed before they infect you. Such bacteria are enclosed in a compartment called the "Phagosome". We find that the lipid membrane covering a phagosome gets enriched in cholesterol, thus generating cholesterol-rich platforms on which many motors assemble as a team. Once such a team is assembled, these motors can generate large collective force to transport the phagosome (and enclosed bacteria) to its death. Therefore, Cholesterol, that much-hated molecule may also be needed to keep you safe from infections !!

About the speaker:

Roop Mallik obtained a Masters in Physics at the University of Allahabad in 1993. He further obtained a PhD in 1999 from the Department of Condensed Matter Physics, Tata Institute of Fundamental Research, Mumbai with E.V. Sampathkumaran. He was a Postdoctoral Fellow with G. Krishnamoorthy and J.B. Udgaonkar at Tata Institute of Fundamental Research, Mumbai and National Centre for Biological Sciences, Bangalore where he worked on Rapid laser-induced pH jump techniques to study protein dynamics of Green Fluorescent Protein. He pursued a second Postdoctoral Fellowship with Steven Gross from 2001-2005 on *In vitro* studies of Molecular motors cytoplasmic Dynein and Kinesin in the Department of Developmental and Cell Biology, University of California Irvine.