BOSE COLLOQUIUM

Friday, 13 December 2013 4.00 pm Fermion

Speaker:

Professor Dr. Debashish Chowdhury, FNA, FASc, FNASc.

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Title:

Molecular motors: a multi-disciplinary enterprise

Abstract:

Molecular motors transduce energy and walk along filamentous tracks. Statistical physicists model the stochastic kinetics of the motors and motor-driven processes to explore the mechanisms of energy transduction and information processing by these machines [1]. Biophysicists investigate the structure and dynamics of molecular motors by using tools of structural biology and those of single-molecule imaging and manipulation [2]. Chemists study the reactions catalyzed by the motors to derive the input energy for their operation as well as the mechanisms of amplification of their capabilities for molecular recognition [3]. Reductionist agenda of molecular cell biologists is to prepare an inventory of the components, tracks, fuel and regulators of molecular motors to get an insight into their biological function. Geneticists identify the roles of various components of a motor, track and its regulators by genetically modifying their design. In this lecture, I'll give an overview of the recent exciting developments and briefly mention a few of our own works in the appropriate context.

[1] D. Chowdhury, Physics Reports (Elsevier), 529, 1-197 (2013).

[2] D. Chowdhury, Biophysical Journal (Biophys. Soc. USA), Invited Mini-Review, 104, 2331-2341 (2013).

[3] D. Chowdhury, FEBS J. (Federation of European Biochem. Soc.), Special Issue: Michaelis-Menten and Allostery Anniversaries (in press) (2013).
