

# IMCB Invited Speaker



**Speaker : Dr. Krishanu Ray**  
*Associate Professor, Department of Biological Sciences,  
Tata Institute of Fundamental Research, Mumbai, India*

Date : 25 March 2013 (Monday)

Time : 4:00PM - 5:00PM

Venue : IMCB Seminar Room 3-46, Level 3, Proteos, Biopolis

Host : Dr. Sudipto Roy

## Seminar :

### Ciliary assembly and activation by Kinesin-2

Cilia and flagella are slender membranous extensions supported by characteristic microtubule organizations, called axoneme. The motile forms of the cilia propel the extracellular fluids, whereas the flagellum propels unicellular organisms. Although the structure and function of these cellular appendages were studied for a long period, recent discoveries of the molecular mechanisms of ciliary assembly and functions have reignited the scientific interest in these tiny organelles. It is now clear vast majority of eukaryotic cells express a cilium or flagella and they act as signal reception and integration centres. Therefore, understanding the molecular details of cilia assembly and functionalization attained a renewed prominence. The structure and functions of sensory cilia are both highly specialized and diversified. Our study on the mechanism of sensory cilia assembly in the fruit fly *Drosophila melanogaster*, revealed that kinesin-2 motor plays a central role in the cilia assembly and in maintaining their functions. I will present an overview of the cilia structure-function and discuss the recent findings from our laboratory on the mechanism underlying odour receptor transport into the cilia.

## About the Speaker :

I started my research career studying the development of chemosensory organs in *Drosophila* at the Tata Institute of Fundamental Research, Mumbai. Subsequently, the work at IMCB, Singapore on the molecular-genetics of Dynein Light Chain provided the first insight into the biological functions of a highly conserved protein. Then, I moved to University of California, San Diego and developed a cellular model for analyzing the kinesin-2 functions in vivo. I established my laboratory at TIFR, Mumbai to investigate the molecular cell biology of intracellular transports and motor proteins. Research work in my laboratory established the kinesin-2 role in axonal transport and in the sensory cilia assembly. In addition, we established the *Drosophila* testis as a cellular differentiation model for analyzing DLC1 functions in vivo. We have a wide range of expertise in Optical and Electron Microscopy of biological samples, Cellular Biochemistry, Molecular Biology and Genetics.