Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Students' Annual Seminar

Investigating the Structural Plasticity of Cristae Junctions: Insights from PINK1-Mic60 Interactions

Bhavesh Upadhyay

Parkinson's disease is a prevalent neurodegenerative disorder and its early onset is often associated with mutations in the PINK1 (PTEN Induced Kinase 1) gene, which regulates mitochondrial quality control. PINK1, a phosphokinase, targets various substrates, including Mic60 within the MICOS complex (Mitochondrial Contact Site and Cristae Organising System). MICOS plays critical roles in mitochondrial processes such as cristae formation, maintenance of mitochondrial ultrastructure, and regulation of mitochondrial membrane dynamics. It has been reported that PINK1 phosphorylates Mic60 to control the structural plasticity of cristae by promoting the formation of increased cristae junctions in energy demanding conditions in vivo.

In this seminar, I will discuss the challenges encountered and the advancements achieved in the purification of Mic60 and PINK1 protein. Furthermore, I will elaborate on our strategy for conducting in vitro phosphorylation studies on Mic60 by PINK1. Additionally, I will address the utilisation of X-ray crystallography and cryo-EM techniques to investigate the overall structure of the PINK1-Mic60 complex and to map their interaction interface.

Wednesday, May 15th 2024

14:30 Hrs (Tea / Coffee 14:15 Hrs)

Seminar Hall, TIFR-H