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

Seminar

Purification and Crystallisation of Mic10 Subcomplex Proteins to Decipher Their Role in Mitochondrial Cristae Architecture

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Mitochondria are essential organelles in eukaryotic cells that generate ATP through oxidative phosphorylation. They possess a unique structure comprising an extensively folded inner membrane with tubular openings called cristae junctions. These junctions create distinct functional regions and play a central role in crucial cellular processes such as apoptosis. The mitochondrial contact site and cristae organising system (MICOS) is a conserved multi-subunit protein complex enriched at cristae junctions that helps to stabilise them, ensuring the morphology of the cristae membrane. Mic10 and Mic13 are crucial membrane protein subunits of the MICOS complex that play a critical role in the formation and maintenance of cristae junctions. Deletion of these proteins lead to abnormal cristae. However, the molecular details of how cristae junctions are formed are not known.

To decipher the molecular details of mitochondrial cristae architecture, we expressed and purified Mic10 and Mic13 and used size exclusion chromatography to show that both Mic10 and Mic13 exists in different oligomeric forms. We have also standardised the crystallisation conditions of Mic10 and Mic13. Our study aims to elucidate the molecular mechanism of how Mic10 and Mic13 are involved in cristae junction formation, which will provide insight into the fundamental biology of mitochondria and potentially lead to new therapies for mitochondrial disorders.

Thursday, May 3rd 2023

10:00 AM (Tea/Coffee at 9:45 AM)

Auditorium, TIFR-H