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

Seminar

Investigation of the Mechanism of Amyloid Aggregation Using Single-Molecule Fluorescence Techniques

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TIFR, Hyderabad

The mechanism of amyloid-β (Aβ) deposition in Alzheimer's disease (AD) remains a central yet unresolved question in neurodegenerative research. Understanding how Aβ aggregates, and how lipids and apolipoprotein E (ApoE)—a major genetic risk factor for AD—influence Aβ42 aggregation pathways, is essential for elucidating AD pathology. In this seminar, I will discuss how distinct phospholipids promote the formation of lipid–peptide condensates with Aβ42, which act as nucleation sites for aggregation. I will also demonstrate that different ApoE isoforms affect the elongation of Aβ fibrils in different ways. ApoE4, for example, binds to Aβ fibril ends less strongly, making it a less efficient inhibitor of elongation. ApoE4's distinctive function in the promotion of Aβ pathology is further underscored by its ability to enhance condensate-mediated nucleation. Together, these findings reveal the molecular interplay between Aβ, lipids, and ApoE, offering new mechanistic insights and potential therapeutic targets for AD.

Wednesday, Oct 22nd 2025

11:30 Hrs (Tea / Coffee 11:15 Hrs)

Auditorium, TIFRH