

Students' Annual Seminar

Tau fibril coexistence within and beyond dense phases during Liquid-to-Solid Transition in Tau-RNA condensates: Insights from Single-Molecule Analysis

Mahaprasad Soumitranjan Sahu

Tau protein is implicated in various neurodegenerative diseases, including Alzheimer's disease and Frontotemporal dementia with Parkinsonism, primarily due to the formation of neurofibrillary tangles composed of β -sheeted fibrils. Recent research suggests that NFT formation may involve liquid-liquid phase separation followed by a liquid-to-solid phase transition occurring during the aging of the tau condensate. This transition alters the mechanical and structural properties of the condensate, although the molecular mechanisms underlying this process remain unclear. We have used a home-built Total Internal Reflection microscope to study liquid-liquid phase separation and liquid-to-solid transition, starting from a homogeneous solution of tau in the presence of PolyU RNA. We have determined the rates of nucleation and elongation of amyloid fibrils of tau. Our study demonstrates that the surface rather than the interior of the condensates facilitates nucleation, although the growth of the fibrils inside the condensates is slow due to its high viscosity.

Tuesday, Feb 20th 2024

14:00 Hrs (Tea / Coffee 13:45 Hrs)

Seminar Hall, TIFR-H