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

Seminar

Regulation of transcription by biomolecular condensates

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Components of the transcriptional machinery are selectively partitioned into specific condensates, often mediated by protein disorder, yet the mechanisms underlying this specificity remain unclear. In physiological contexts, we find that condensates formed by the intrinsically disordered region (IDR) of MED1 selectively recruit RNA Polymerase II and positive regulators of transcription, while excluding negative regulators, through a molecular grammar defined by patterned blocks of charged residues. In contrast, transcription factor oncofusions acquire a distinct gain-of-function signature—enriched in π–π and π-interacting residues and depleted in aliphatic residues—that enables aberrant recruitment of RNA Polymerase II and activation of oncogenic programs. Together, these results reveal distinct, sequence-encoded modes of condensate specificity that operate across physiological and pathological states.

Tuesday, Apr 22nd 2025

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

Auditorium, TIFRH