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

Seminar

Understanding the mechanisms of nuclear envelope disassembly and chromatin decondensation in animal cells

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A key unresolved question in cell biology is how the complex process of cell division is precisely coordinated to ensure accurate growth and development. Our lab employs a range of cellular and molecular biology techniques to deepen our understanding of critical processes involved in cell division, such as nuclear envelope (NE) disassembly at the onset of mitosis, chromatin organisation, and cytokinesis post mitosis. In the first part of my presentation, I will highlight our recent findings on a novel role of the PP2A phosphatase in NE disassembly. While it is commonly accepted that mitotic kinases drive NE disassembly, a crucial step for chromosome segregation, our research reveals that phosphatases also play an essential role. Our data suggest that a biochemical tug-of-war between kinases and phosphatases is crucial for orchestrating NE disassembly during mitotic entry.

Additionally, I will discuss the mechanisms behind chromatin decondensation at the end of mitosis. During mitotic entry, chromosomes undergo significant condensation while the NE disassembles. At the mitotic exit, the NE reforms, and chromosomes return to their decondensed state. Proper nuclear reorganisation and chromatin decondensation are essential for resuming transcription and replication, yet the mechanisms governing these processes remain poorly understood. Here, I will present our findings on the role of NuMA, an evolutionarily conserved protein, in chromatin decondensation and nuclear reorganisation following mitosis.

Friday, Oct 18th 2024

11:00 Hrs (Tea / Coffee 10:45 Hrs)

Auditorium, TIFR-H