

Seminar

From cell shape to chromosome segregation: how MLL histone methyltransferase family regulates diverse cellular processes

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Mixed-lineage leukemia (MLL) protein, a human homolog of *Drosophila trithorax*, was first identified for its involvement in chromosomal translocations associated with lymphoid and myeloid acute leukemia in infants and adults. Subsequently, MLL was found to have critical roles in cell-fate decisions during skeletal development and haematopoiesis in higher vertebrates by regulation of the Hox genes. The transcriptional activities of MLL are achieved through chromatin-modifying functions of its **Su** (var) 3-9, **E**nhancer of Zeste, **T**rithorax (SET) domain.

I will be talking about how MLL regulates diverse functions in the cell. Attainment of proper cell shape and regulation of cell migration are essential processes in development of an organism. Rho GTPases—RhoA, Rac1 and CDC42—are small G proteins that regulate various key cellular processes like actin cytoskeleton formation, maintenance of cell shape and cell migration etc. I will talk about how MLL regulates the homeostasis of these small Rho GTPase. In the second part of the talk, I will address the involvement of MLL in the transcriptional regulation of non-coding region like centromeres. Centromeres, highly repetitive in sequence, present a unique chromatin state which is different from constitutive heterochromatin or euchromatin. Despite this distinct state, centromeres are transcribed by RNA polymerase II and produce centromere RNA transcripts. I will discuss which member of MLL family are involved in regulating the epigenetic landscape of the centromeres.

Tuesday, Oct 18th 2022

4:00 PM (Tea/Coffee at 3:45 PM)

Auditorium, TIFR-H