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

Webinar

Unraveling riboswitch mechanisms by a combined investigation of RNA structure, dynamics and interactions

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Riboswitches are structured mRNA domains that sense intracellular metabolites to regulate gene expression through RNA conformational changes. An integrative approach to study both the structure and ligand-dependent conformational dynamics is key to understand riboswitch gene regulation mechanisms. In this talk, I will first present the structure of a recently discovered T-box riboswitch that regulates translation by binding to specific tRNAs with high affinity. Further, I will discuss our work on using single-molecule fluorescence microscopy to probe tRNA interaction with the T-box riboswitch which showed a kinetic model for discrimination of charged vs uncharged tRNA. Later, I will talk about the structural basis for selective Mn^{2+} sensing by a Mn^{2+} riboswitch. Using single-molecule fluorescence resonance energy transfer (smFRET), my work identified previously unknown conformations of the Mn^{2+} riboswitch and revealed its molecular mechanism where binding of a small Mn^{2+} ion stabilizes an inherently dynamic RNA to prevent transcription termination.

References:

1. Suddala, K. C. & Zhang, J. Nat. Struct. Mol. Biol. 26, 1114-1122, (2019).
2. Suddala, K. C., et al., Nat. Commun. 1896, 1-14, (2018).
3. Suddala, K. C. & Price, I. R., et al., Nat. Commun. 4304, 1-16, (2019).

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9:00 AM