

DBS Seminar on Tuesday, 24th February 2026
At 4 pm; AB2-5B, Academic Block-2, IISER Mohali

Message in a package: How mRNA bound proteins dictate mRNA organization and fate

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Abstract

Genetic control of RNA activity by RNA binding proteins (RBP) is critical for cellular function and organismal development. Often, RBPs are mutated in human diseased states and are targeted by pathogens. The work in the Singh lab focuses on a crucial RBP complex in eukaryotic cells, the Exon Junction Complex (EJC), which is a hallmark of RNAs subjected to spliceosome-dependent intron removal. During intron removal, the spliceosome deposits three EJC core proteins EIF4A3, MAGOH and RBM8A ~24 nucleotides upstream of splice junctions in a sequence-independent manner. The trimeric EJC core plays a key role in RNA packaging and serves as an adapter for many nuclear and cytoplasmic RNA processing steps, until it is dislodged by the elongating ribosome. Our recent work, which will be focus of the talk, shows that an EJC disassembly factor PYM1 is a translation-independent EJC destabilizer that limits accumulation of the complex at unexpected locations. Thus, PYM1 is crucial in maintaining the fidelity of EJC binding. We find that loss of PYM1 function preferentially affects mRNAs localized to endoplasmic reticulum and membrane. These findings have important implications for understanding viral pathogenesis as PYM1 is targeted by flaviviruses to promote viral replication at the endoplasmic reticulum.
