

Seminar

Within and Beyond the boundaries of proteasomal Assembly: PSMD9 Chaperone as an Architect of Cellular Order

Prasanna Venkatraman

ACTREC-TMC, Mumbai

With only a limited edition of the human genome available, explaining the functional repertoire and regulation of an autonomous cell, depends on our ability to accurately decode its regulatory circuits and uncover adaptive responses. In this talk, we summarise a case study of PSMD9/Nas2/Bridge 1, one of the proteasomal assembly chaperones that is scripting a new chapter in the Ubiquitin Proteasome Pathway. Using rules that govern cellular communication, we define several novel functions of PSMD9, at the heart of which is a unique SLiM (Short Linear Motif) centric, protein atlas of PSMD9. To top it, several screening platforms in published literature provide additional evidence for its wide repertoire of functions that spans proteasome biogenesis, organelle structure, signalling, stress response and resilience. Stepping out of its conventional role in 19S assembly, the talk will unmask the hidden adaptive functions of this protein as it emerges as a key survival factor in luminal breast cancers by impacting several cellular homeostatic mechanisms in cells including tumour proteasome structure defined by Graph Theory and a few housekeeping functions. While identifying PSMD9 as an Achilles heel in breast cancer, the talk will also outline our early adventures in the design of selective inhibitors that can potentially target its non-canonical adaptive functions.

Thursday, Jul 24th 2025

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Auditorium, TIFRH