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

Comprehensive Seminar

Investigating the physiological stoichiometry of CRAC channels and its role in calcium signalling

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Calcium (Ca^{2+}), a universal second messenger, is critical for numerous biological processes, including T-cell activation. Store-operated Ca^{2+} entry (SOCE) mediated by Ca^{2+} release-activated Ca2+ (CRAC) channels is a ubiquitous mode of calcium influx in almost all cells. CRAC channel pore is formed by Orai proteins. While the crystal structure of Drosophila Orai suggests a hexameric channel, the native stoichiometry of the human CRAC channel remains debated. We hypothesize that mammalian Orai1 channels exhibit flexible stoichiometry on the plasma membrane depending on stimuli and may also form heteromeric channels with other Orai homologs (Orai2 and Orai3), resulting in variable channel properties. The stoichiometric flexibility could explain the distinct Ca^{2+} influx patterns observed in response to diverse T-cell stimuli. In this seminar, I will discuss the stoichiometry of CRAC channels, its dynamic flexibility in response to various stimuli and potential role in fine-tuning Ca^{2+} signalling in T-cells.

Wednesday, Dec 18th 2024

09:30 Hrs (Tea / Coffee 09:15 Hrs)

Auditorium, TIFRH