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

Seminar

In-silico study of bacteria and bacterial cytoplasmic organelles

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Bacteria, as a well-known example of living active matter, exhibit a spectrum of complex behaviours in their lifestyles. At the heart of these behaviours lies their cytoplasm, a dense, viscous soup-like medium enveloped by a cell wall. Bacterial cytoplasm is a highly crowded environment with numerous poly-disperse membrane-less moieties/organelles. In this talk, I will mainly discuss the dynamics of bacterial cytoplasmic particles and the impact of metabolic activities on bacterial behaviour by using numerical simulations and machine learning models. Moreover, by using an agent-based model, I will delve into the interplay between motility and extracellular polymeric substances (EPS) in shaping colony architecture and dynamics in a growing bacterial colony. Overall, our findings combine computational modelling and machine learning techniques to unravel the dynamic complexity of bacterial behaviour, shedding light on fundamental processes essential for bacterial survival and adaptation.

Monday, Jun 3rd 2024

14:45 Hrs (Tea / Coffee 14:30 Hrs)

Auditorium, TIFR-H