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

# Seminar

## Mechanobiological investigation of epithelial homeostasis during epithelial defence against cancer

## Praver Gupta

### TIFR, Hyderabad

Epithelial homeostasis is crucial for maintaining tissue integrity and function. Epithelium achieves biomechanical equilibrium by actively extruding unfit cells that may compromise epithelial barrier, through cell competition. Specifically, cell competition mediates the non-cell autonomous removal of precancerous, transformed mutant cells expressing activating oncoprotein $HRas^{V12}$, referred to as epithelial defence against cancer (EDAC). In particular, a biochemical crosstalk in conjunction with mechanical forces maintains the fidelity of this fundamental process. In this talk, I would discuss our work on the characterisation of the mechanical origin of EDAC and how subcellular modalities bring about these features in play, to make competitive removal of transformed mutants robust. Specifically, I would show how non-proliferative cell competition is a unique feature of epithelial homeostasis during EDAC and is based purely upon the mechanical fragility of transformed mutant population in the face of active compression. I would introduce a novel mechanobiological technique called gel compression microscopy, which we developed to characterise compressibility in epithelial tissues and indeed show mechanical fragility during transformation. Finally, I would elaborate on the subcellular components in the mutants, the nucleus and cytoplasmic intermediate filaments, which form the basis of this mechano-phenotype, powering cell competition during epithelial defence against cancer.

***Monday, Jul 22nd 2024***

***11:30 Hrs (Tea / Coffee 11:15 Hrs)***

***Auditorium, TIFR-H***