

Students' Annual Seminar

Cell shape variability in a confluent cellular monolayer

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Cell shape influences wound healing, cancer progression, morphogenesis etc. and controls organ shape. Recent works show that shape variability, often regarded as biological noise, in different epithelial monolayers follows a nearly universal distribution. The origin of this universality, its relation to the physical variables, why cells change their shapes during development and disease etc. remain unanswered.

I will discuss a mean-field analytical theory for cell shape characterised via aspect ratio (AR). The probability distribution function (PDF) of AR is controlled by a single parameter, α , containing all the system-specific details: this leads to universality in cell-to-cell shape variability and can describe both statics and dynamics. The theory provides a framework to analyse and compare diverse epithelial systems. I will also discuss some implications of our results and future directions.

References:

Sadhukhan & Nandi, on the origin of universal cell shape variability in confluent epithelial monolayers (2022), *eLife* **11**:e76406, <https://doi.org/10.7554/eLife.76406>

Monday, Apr 10th 2023

5:00 PM

Seminar Hall, TIFR-H