

Seminar

Investigating Golgi remodelling in epithelial wound healing and development

Purnati Khuntia

TIFR, Hyderabad

The apico-basal polarity of epithelial cells, critical for epithelial barrier function, undergoes reorganisation during physiological processes like wound healing, morphogenesis and metastasis. A key event in this reorganisation is the translocation of the Golgi apparatus from the apical to the basal surface. However, the mechanistic understanding of Golgi position change during the reorganisation remains elusive. Here, we introduce "Migration-Induced Golgi Apparatus Remodelling" (MIGAR), characterised by transient Golgi dispersion into the nuclear equatorial plane during epithelial monolayer migration. Intriguingly, MIGAR is mechanistically different from mitotic Golgi remodelling, and it is independent of Golgi-associated microtubules. Molecularly, Arp2/3-derived actin-ring remodelling orchestrates the equatorial Golgi dispersion, mediated through the Golgi-localised MENA-GRASP65 complex. Functionally, the equatorial Golgi dispersion is essential for persistent and directional cell migration. In addition, a systematic investigation of factors influencing Golgi reorientation reveals the role of local forces in guiding Golgi orientation in migrating epithelial cells.

Furthermore, we explore the relevance of Golgi organisation in complex physiological environments, focusing on intestinal organoid development. In the hinge cells of developing organoids, we observe perinuclear Golgi localisation, which may contribute to the unique morphology and function of hinge cells involved in maintaining the crypt-villi intestinal architecture. This work underscores Golgi remodelling as an important factor in regulating directional cell migration and suggests its role in diverse collective environments.

Friday, Sep 29th 2023

11:30 AM (Tea / Coffee 11.15 AM)

Auditorium, TIFR-H