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DEPARTMENT OF SCIENCE & TECHNOLOGY

INSTITUTE COLLOQUIUM

(Through Webinar)

TITLE : Spatio-temporal regulation of membrane fluctuations and mechanics in cells

Speaker : DR. BIDISHA SINHA,
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INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, KOLKATA

Webinar Link

5th March' 2021
4pm onward

YouTube Link

Abstract : Plasma membrane deformations result in diverse cellular functions – membrane trafficking to motility – and closely governed by its mechanical properties – reflected in its height fluctuations. I will talk about our work on understanding spatio-temporal regulation of membrane mechanics using interference microscopy, wherein membrane fluctuations are imaged at high z-resolution and diffraction limited xy resolution on parts of adherent single cells. Averaged-out measurements demonstrate how internal factors – metabolic state, the actomyosin cytoskeleton, cholesterol as well as external interactions: adhesion with substrate regulate fluctuations and tension. However, I will also share our results that show how intracellular mapping of fluctuations and tension bring out rules underlying their local regulation. Further, I will draw examples from endocytosis, collective cell motility and myogenesis to demonstrate how maps provide key insights about the role played by membrane tension in these processes. Finally, I will talk about limitations and need for newer framework to use these studies to gain deeper understanding.

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