BIO-TALK | Biomolecular condensates and microtubules: Reconstructing force transmission during touch in Caenorhabditis elegans

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12:00 to 13:00
Seminar Room

Biomolecular condensates are viscoelastic entities capable of sustaining and transmitting forces at scales critical for cellular homeostasis. One example is MEC-2, which, via its intrinsically disordered C-terminal domain, forms biomolecular condensates within the axons of touch receptor neurons in the nematode Caenorhabditis elegans. In these neurons, MEC-2 participates in the mechanotransduction pathway mediating gentle touch sensation, where it has been proposed to act as a physical linker between the microtubule cytoskeleton and the mechanosensitive ion channels responsible for touch sensation; however, direct evidence of this interaction has remained elusive for years.

In this talk, I will present an exploration of the interplay between microtubules and MEC-2 biomolecular condensates. I will show how optical tweezers can be leveraged to quantify the mechanical properties of biomolecular condensates in vitro, and how these properties are modified in the presence of tubulin. Finally, I will discuss in vivo experiments in which we observed the interplay between MEC-2 condensates and the microtubule network in heterologous cells.

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