הטכניון - מכון טכנולוגי לישראל

TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY

הפקולטה להנדסה כימית
ע"ש וולפסון
The Wolfson Department of Chemical Engineering

Wolfson Department of Chemical Engineering Seminar
Lecture Hall 6, Wolfson Department of Chemical Engineering,
Wednesday November 21st at 1:30pm

Prof. Kinneret Keren

Department of Physics, Technion

Hydra regeneration: actin dynamics and the influence of mechanical constraints

Morphogenesis is one of the most remarkable examples of biological self-organization. We focus on the mechanical aspects of morphogenesis using Hydra, a small multicellular fresh-water polyp, as a model system. Hydra has a simple body plan with uniaxial symmetry and is famous for its regeneration properties. We utilize regenerating Hydra as an experimental platform to explore how mechanics influences the development of the body plan. I will discuss our recent results showing that structural inheritance of the supra-cellular actomyosin fibers directs body-axis formation in regenerating Hydra. Morphogenesis is then stabilized by dynamic cytoskeletal reorganization induced by the inherited structure. We further examine the role of mechanics in morphogenesis by embedding regenerating Hydra tissues in viscoelastic hydrogels of varying geometries and rigidities, and externally imposing an anisotropic mechanical environment. Through tracking tissue geometry and actin fiber organization during regeneration, we show that the new body axis can be induced to form along the 'easy axis' defined externally by the matrix, suggesting the importance of mechanical feedback during morphogenesis.

Refreshments will be served at 1:15pm