Seminar/Talk

Mechano-chemical active feedback generates convergence extension in epithelial tissue

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Convergence extension, the simultaneous elongation of tissue along one axis while narrowing along a perpendicular axis, occurs during embryonic development. It is a fundamental process that contributes to shaping the organism and it happens in many different species and tissue types. I will present a minimal continuum model, that can be directly linked to the controlling microscopic biochemistry, which shows spontaneous convergence extension. It is comprised of a 2D viscoelastic active material with a mechano-chemical active feedback mechanism coupled to a substrate via friction. Robust convergent extension behaviour emerges beyond a critical value of the activity parameter and is controlled by the boundary conditions and the coupling to the substrate. Oscillations and spatial patterns also emerge in this model when internal dissipation dominates over friction, as well as in the active elastic limit.

Wednesday, January 10, 2024 11:00am - 12:00pm
Moonstone Bldg / Ground floor / Seminar Room F (I24.EG.030f)

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