

Abstract Submitted
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The Collective Contractile Dynamics of Confluent Epithelial Cells is Highly Coherent THOMAS ANGELINI, Harvard University, INEST program, MANUEL MARQUEZ, PMUSA, DAVID WEITZ, Harvard University — We have studied the collective contractile dynamics of confluent Cos-7 epithelial cells in several contexts. We patterned cells in single file lines on confined PDMS 'rubber bands', and quantified substrate deformation by tracking embedded fluorescent particles over the course of approximately 10 hours. Deformations confined to one dimension, well over ten microns in magnitude, correlated over distances exceeding the millimeter scale, were observed. On unpatterened PDMS, collective substrate deformations in two dimensions were over ten times smaller, and exhibited a propagating mechanical excitation. Three dimensional matrix deformation was studied by embedding cells at high density in 1mg/ml collagen. Since collective network deformations are difficult to quantify in the microscope, a dynamic small angle light scattering technique was adapted. With this technique, we have spectrally characterized the three dimensional mechanical network deformations, and observed collective behavior similar to the measurements on compliant surfaces.

Thomas Angelini
Harvard University, INEST program

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