



CDB SEMINAR

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European Molecular Biology Laboratory (EMBL), Germany

Monday, November 28, 2016

16:00-17:00 Seminar Room A7F

Shaping Cells and Tissues: from Embryonic Development to Synthetic Biology

Summary

Morphogenesis of multicellular organisms is characterized by changes in cell and tissue behaviors that occur at specific space and time in a coordinated manner. This stereotypic and genetically encoded spatio-temporal organization makes it difficult to determine the extent to which individual cell behavior drive morphological remodeling. In my talk I will describe an optogenetic-based synthetic approach that allowed us to reconstitute epithelial folding in naïve *Drosophila* embryonic tissues. I will presents experiments showing that precise spatial and temporal activation of Rho signaling is sufficient to trigger apical constriction and tissue folding independently of any pre-determined physical and biochemical conditions or other tissue-scale properties that accompany endogenous invagination processes. Synthetic furrows can occur at any position along the d-v or a-p embryo axis in response to the spatial pattern and level of optogenetic activation. These results suggest that epithelial folding is, thus, a direct function of the spatio-temporal organization and strength of Rho signaling that is on its own sufficient to drive tissue invagination.

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