Seminar/Talk

Transmission of cytokinesis forces via E-cadherin dilution and actomyosin flows

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During epithelial cytokinesis, the remodelling of adhesive cell-cell contacts between the dividing cell and its neighbours has profound roles in the integrity, arrangement and morphogenesis of proliferative tissues. In both vertebrates and invertebrates, this remodelling requires the activity of non-muscle myosin II (MyoII) in the interphasic cells neighbouring the dividing cell. However, the mechanisms coordinating cytokinesis and MyoII activity in the neighbours are unknown. Here we find that in the Drosophila notum epithelium, each cell division is associated with a mechano-sensing and transmission event controlling MyoII dynamics in the neighbours. We established that the ring pulling forces promote local junction elongation, resulting in local E-cadherin (E-Cad) dilution at the ingressing adherens junction (AJ). In turn, the reduction of E-Cad concentration and the contractility of the neighbouring cells promote self-organized actomyosin flows, ultimately leading to MyoII accumulation at the base of the ingressing AJ. While force transduction has been extensively studied in the context of AJ reinforcement to stabilize adhesive cell-cell contacts, we propose an alternative mechano-sensing mechanism able to coordinate actomyosin dynamics between epithelial cells and to sustain AJ remodelling in response to mechanical forces.

Monday, April 10, 2017 11:00am - 12:00pm
Experimental Biology Room (I04.2OG - LAB)

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