CDB SEMINAR

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Wednesday, March 5, 2014
15:00~16:00 A7F Seminar Room

Planar Cell Polarity and septins compartmentalize cortical actomyosin to direct collective cell movement

Summary

The collective cell movements of convergent extension (CE) are essential for global embryonic reorganization during gastrulation and neural tube closure as well as for local morphogenetic events during organogenesis. Despite recent advances in understanding the movement of individual cells, we still know very little about where and how developmental signals act to direct the actomyosin machinery during collective cell movements in vertebrate embryos. We approached the question by focusing on gastrulation in *Xenopus laevis* embryos, and found that the Planar Cell Polarity (PCP) system directs septin-mediated compartmentalization of cortical actomyosin dynamics. Such spatially restricted actomyosin results in specific shortening of cell-cell junctions, which in turn powers cell intercalation during CE. This new model is clearly distinct from the long-standing archetype of *Xenopus* gastrulation, but sharing the feature with CE in *Drosophila* and chick embryonic epithelia. Our data suggest that contraction of cell junctions via compartmentalized actomyosin is unifying feature of CE, and shed new light on the interplay between developmental signaling systems and the fundamental machinery of cell behavior.

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