CDB SEMINAR

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Thursday, April 17, 2014

16:00~17:00 C1F CDB Auditorium

Investigation of beta-Spectrin function in the Hippo signaling pathway

Summary

The Hippo signaling pathway is an evolutionarily conserved pathway regulating a wide range of developmental and cellular processes such as growth, differentiation, and morphogenesis. Importantly, the Hippo signaling pathway is known to respond to regulatory signals from the actin cytoskeleton, consistent with the hypothesis that the Hippo signaling pathway functions to sense and interpret mechanical signals such as tissue shape, geometry and tension to coordinate cell behaviors in a multicellular organism. However, the mechanism of how the actin cytoskeleton regulates the Hippo pathway remains largely elusive.

We identified beta-Spectrin as a protein required for Hippo signaling activity in a genetic screen for oocyte polarity defects during Drosophila oogenesis. Spectrins are known for linking the actin cytoskeleton to the plasma membrane. In this talk I will discuss the function of beta-Spectrin in regulating cellular tension and Hippo signaling activity. We demonstrated that mutations in beta-spectrin cause precocious myosin contraction and oscillation. Moreover, in the beta-spectrin mutant cells, the actin filaments lose the planar polarized orientation and frequently form abnormal stress-fiber-like structures on the basal side of the epithelium. Increased cellular tension associated with formation of stress fibers is likely a critical link between beta-spectrin mutations and Hippo signaling defects.

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