



CDB SEMINAR

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Friday, October 31, 2014

15:00-16:00 Seminar Room A7F

Shaping the mammalian inner ear sensory organs by the vertebrate planar cell polarity pathway

Summary

The vertebrate planar cell polarity (PCP) pathway regulates the coordinated orientation of sensory hair cells in the mammalian inner ear, which is essential for the sensitivity and resolution of mechanotransduction of the inner ear. Collective studies including ours demonstrated a conserved mechanism of polarized partition of membrane PCP proteins in coordinating the polarity among neighboring cells, and the involvement of cilia genes in directing the intrinsic polarity of each individual cell. Many key issues of the mammalian PCP regulation remain unknown. It is not clear how the polarized partition of membrane PCP complexes is achieved and how the membrane PCP complexes communicate with the intrinsic polarity determinants. To further explore the mechanisms underlying vertebrate PCP regulation, we undertook a 2-hybrid screen with the cytoplasmic domain of a membrane PCP protein, Vangl2. We identified proteins with roles in protein trafficking and membrane targeting, in ciliogenesis, and potentially in cytoskeleton regulation. Functional studies of these genes revealed a molecular network that act together for PCP regulation in vertebrates. We will present the new results of these studies and discuss the implications of these studies in the understanding of the vertebrate PCP pathway that play essential roles in gastrulation, neurulation, and organogenesis of many tissues during development.

Host:

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