CDB SEMINAR

Miho Matsuda

Section on Neural Developmental Dynamics

LMG, NICHD, NIH, USA

Friday, April 24, 2009

16:00~17:00 A7F Seminar Room

Notch signaling is essential for coordinating cell fate, morphogenesis and migration in the lateral line primordium

Summary

The lateral line is a sensory system designed to sense directional water movement. It is a model for understanding sensory hair cell development in vertebrates. The lateral line consists of hundreds of small cellular units, called neuromasts. In the zebrafish, the posterior lateral line primordium (pLLp) migrates caudally and periodically deposits neuromasts. Each neuromast, formed within the migrating pLLp, has a center-oriented epithelial rosette and a central *atoh1*-positive hair cell determined by Notch mediated-lateral inhibition. Previous studies suggest that morphogenesis, deposition of neuromasts and pLLp migration are coordinated by two mutually antagonistic signaling centers, a Wnt signaling center at the leading edge and a FGF signaling center in the adjacent domain. However, it is not fully understood how these signaling centers are maintained during the pLLp migration and neuromast depositions. In this study, we hypothesized that the single *atoh1*-positive cell at the center of each neuromast also might contribute to its coordinated morphogenesis. Live imaging of the pLLp in *mib* mutants, which have lost function of an E3 ubiquitin ligase essential for efficient Notch signaling, showed that *mib* pLLp deposited neuromasts irregularly, eventually stalled and dissociated into several small cell clusters. We analyzed FGF and Wnt activity in *mib* mutants. Our results suggest that Notch signaling-mediated lateral inhibition restricts FGF sources and helps maintain balanced FGF and Wnt signaling in the migrating pLL primordium.

Host:
Shigenobu Yonemura
Electron Microscope Laboratory, CDB
yonemura@cdb.riken.jp
Tel:078-306-3106
(ext:1314)