Singapore Developmental Biology Club

SEMINAR ANNOUNCEMENT

16 November 2011, Wednesday
Temasek Life Sciences Laboratory, Auditorium, 1 Research Link,
National University of Singapore
5.00pm – 6.00pm

Dr. Fumio Matsuzaki

CELL ASYMMETRY, RIKEN CDB, JAPAN

Seminar Title: Orienting tissue growth in response to the environment; a GPCR directs the Par polarity complex.

During development, directional cell division is a major mechanism for establishing the orientation of tissue growth as tissue stem cells often generate differentiated cells in a particular direction in response to their niche. *Drosophila* neuroblasts, which are polarized by the Par complex system, are an excellent model system for studying the arrangement of stem cell divisions relative to the environment. In the embryonic central nervous system, neuroblasts undergo a series of asymmetric divisions perpendicular to the overlying epithelium to produce descendant neurons on the opposite side, thereby orienting initial neural tissue growth, but this mechanism remains elusive. Here we provide genetic evidence that extrinsic GPCR signaling determines the orientation of cortical polarity underlying the asymmetric divisions of neuroblasts relative to the epithelium. The GPCR Tre1 activates the G protein oa subunit in neuroblasts by interacting with the epithelium. GTP form of Goa preferentially binds to Pins, a molecule known to regulate mitotic spindle orientation. Because Pins associates with the Par-complex via Inscuteable, Tre1 consequently recruits the polarity complex such that the polarity axis of neuroblasts orients orthogonally to the epithelium. Given the universal role of the Par-complex in cellular polarization, we propose that the GPCR-Pins system is a comprehensive mechanism controlling tissue polarity by orienting polarized stem cells and their divisions.

All are welcome. For more details on Singapore Developmental Biology Club, please visit www.singaporedbc.blogspot.com