横浜市立大学 21世紀COE
特別レクチャー

Title： Special Lecture Series on

"Cell Polarity During Vertebrate Morphogenesis."

Speaker： Nancy Papalopulu
(Faculty of Life Sciences, University of Manchester, UK)

Thomas Lecuit
(Institute of Developmental Biology of Marseille-Luminy, France.)

Date/Time： 平成１９年５月３１日（木）午後３時～８時まで

Place： D1（旧第２講義室）

Program：

１． Early cell polarity and neural progenitor cell fate in a vertebrate nervous system.
Nancy Papalopulu (Faculty of Life Sciences, University of Manchester, UK)
２． Discussion with graduate students.
３． Regulation of cell surface mechanics underlying tissue morphogenesis
Thomas Lecuit (Institute of Developmental Biology of Marseille-Luminy, France.)
４． Discussion with graduate students.

Summary： Early cell polarity and neural progenitor cell fate in a vertebrate nervous system.
Nancy Papalopulu (Faculty of Life Sciences, University of Manchester, UK)
During vertebrate development neuronal differentiation is temporally controlled. The frog provides a good model system to understand how this is achieved as it undergoes two waves of neurogenesis, primary and secondary. The frog neural plate has two layers of cells that intercalate during neurulation. Primary neurons are derived form the deep layer of the neural plate while most cells that are located in the superficial layer escape primary neurogenesis. By fate mapping single superficial neural plate cells we have shown that the majority of these cells remain undifferentiated through the period of primary neurogenesis and many become radial glia cells, which may contribute to later neurogenesis.I will show that these superficial-layer derived progenitor cells are intrinsically refractory to primary neurogenesis and are derived from outer polarized epithelial cells in the blastula by oriented divisions. Overexpression of aPKC expands the apical domain at the expense of the basolateral and loss of aPKC function or overexpression of Lgl2 has the opposite effect. I will then describe our efforts to understand whether these changes in polarity also affect the fate of the cells. Finally, I will present the result of a microarray analysis that has identified a superficial layer specific transcription factor, Grhl3. We have shown that Grhl3 promotes superficial gene expression and in doing so, suppresses primary neurogenesis.

Regulation of cell surface mechanics underlying tissue morphogenesis
Thomas Lecuit (Institute of Developmental Biology of Marseille-Luminy, France.)
Epithelial tissue architecture requires intercellular adhesion mediated by the cell adhesion molecule E-cadherin. Yet, epithelial tissues exhibit a remarkable plasticity during development and epithelial cells can extensively remodel their contacts. The molecular mechanisms of dynamic adhesion are poorly understood. We study this basic problem in the Drosophila early embryo. Epithelial cells exchange neighbours during a process called cell intercalation, and thereby contribute to the antero-posterior elongation of the embryo. Such intercalation depends on the planar polarized remodelling of apical junctions consisting of two steps: junction shrinkage and re- growth at a perpendicular. This process can be simply explained in the context of a surface tension based model with anisotropies in either adhesion and/or cortical tension. While we showed that Myosin-II polarized enrichment controls junction remodelling consistent with this model, we currently address the possible regulation of adhesion during intercalation. We will describe on-going work attempting to characterize the organizing principles of dynamic adhesive surfaces by E-cadherin and actin filaments and see how it applies to understanding junction remodelling during intercalation.

□ 問合せ先 ： 分子細胞生物学（旧第２生化学） 大野 茂男 (内線 2597)