CDB SEMINAR

Speaker: **Hiroki Nishida**

< Graduate School of Science, Osaka University>

Title: **"Maternal and zygotic processes of cell fate specification during ascidian embryogenesis"**

Date: Monday, November 14
Time: 16:00～17:30
Place: 1F Auditorium of Building C

Dr. Nishida is one of the most prominent scientists in the embryogenesis research, known by the text book work on ascidian early cell lineage and recently by his identification of the "macho" gene that brought a molecular answer to a long lasting mystery about muscle determinants localized in the ascidian zygote. This seminar will provide you a great opportunity to learn his overview about ascidian embryogenesis from the progress in the last decade to the future perspective, centering on his own study.

Summary:

Setting up future body axes is the first important event before and at the beginning of embryogenesis. The ascidian embryo is a classical model that has been used to gain insight into developmental processes for over a century. I summarize advances made in this decade in our understanding of the developmental processes involved in the specification of the embryonic axes and cell fates during early ascidian embryogenesis. Maternal factors including mRNAs are translocated to specific regions of the egg by cytoplasmic and cortical reorganization, so-called ooplasmic segregation, and specify the animal-vegetal axis and the one perpendicular to it, which is defined as the antero-posterior axis in ascidians. Some postplasmic/PEM RNAs that are anchored to cortical endoplasmic reticulum are brought to the future posterior pole of fertilized eggs, and play crucial roles in posterior development. Following specification of the animal-vegetal axis, nuclear localization of beta-catenin takes place in the vegetal blastomeres; this is important for the acquisition of the vegetal character of the blastomeres in later development. Positioning of these maternal factors lead to subsequent cell interactions and zygotic gene expression responsible for axis establishment and for cell fate specification. Endoderm blastomeres in the vegetal pole region emanate inductive signals mainly attributable to fibroblast growth factor. Marginal blastomeres next to endoderm blastomeres respond differently in ways that are determined by intrinsic competence factors. Expression patterns of developmentally important genes, including key transcription factors of each tissue type, are also summarized.

Host : Fumio Matsuzaki <Cell Asymmetry, CDB>
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