CDB SEMINAR

Takashi Hiiragi

EMBL Heidelberg, Germany

Monday, June 1, 2015

16:00~17:00 Seminar Room A7F

Symmetry breaking in mouse development

Summary

A fundamental question in biology is the mechanism by which the embryonic polarity is established during development. Unlike many organisms, mammalian eggs lack polarity and symmetry among cells has to be broken during early embryogenesis. This symmetry breaking process in mammalian embryos result in formation of the blastocyst, consisting of two major cell types, the inner cell mass and trophectoderm, which are distinct in their position and gene expression. Recent studies unexpectedly revealed that morphogenesis and gene expression is highly dynamic and stochastic during this process. What signal breaks the initial symmetry and how stochastic gene expression leads to the reproducibly patterned blastocyst remain open questions about the beginning of mammalian life.

We have developed new imaging and experimental systems to monitor early mouse development at unprecedented spatio-temporal resolution. Using genetics, high-resolution microscopy and computational analysis, we established a map of mouse pre-implantation development and identified the moment of symmetry breaking. This breakthrough now provides the basis to investigate the cellular and molecular mechanism of symmetry breaking in mouse development.

Hosts:
Tomoya Kitajima
Chromosome Segregation, CDB
tkitajima@cdb.riken.jp
Tel:078-306-3346 (ext:4447)

Miki Ebisuya
Reconstitutive Developmental Biology, QBiC
miki.ebisuya@riken.jp
Tel:078-306-3425 (ext:4453)