BIOENGINEERING SEMINAR

“Symmetry Breaking and Self-Organisation in Mouse Development”

Thursday – October 6, 2016 – 10h15
EPFL – room SV1717

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host: Prof. Matthias Lutolf

Abstract

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 results 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 an experimental system to monitor early mouse embryogenesis by live-imaging at unprecedented spatio-temporal resolution. This provides us with a basis for investigating the cellular and molecular mechanism of symmetry breaking and self-organisation in early mammalian development.

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