

SPIRITS Mechanobiology Seminar



Day: Dec. 24 (Tue), 16:30 - 17:30

Place: Grad Sch Med, F building

医学部構内F棟1階セミナー室

Language: English

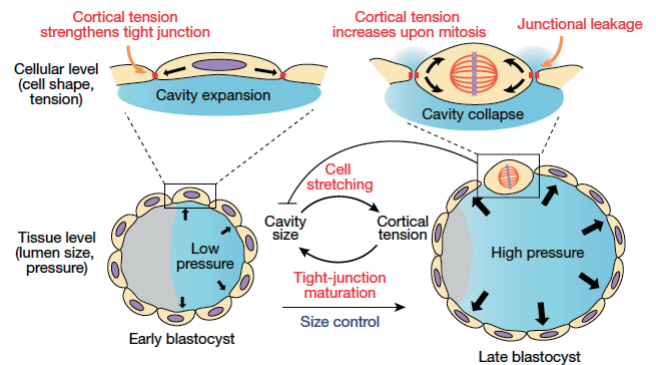
Dr. Chii Jou Chan (Joe)

(EMBL Heidelberg, Germany)

Mechanochemical feedback control in mammalian blastocyst patterning

Many developmental processes involve the emergence of intercellular fluid and lumenogenesis. This could result in a build up of hydrostatic pressure and signaling molecules in the lumen. However, the potential roles of lumina in cellular functions and tissue morphogenesis have yet to be fully explored. In the first part of my talk, I will discuss recent evidence that pressurised fluid expansion can provide both mechanical and biochemical cues to control mouse blastocyst size and patterning^{1,2}.

I will also present latest finding that cell sorting during blastocyst patterning is accompanied by a fluid-solid transition in the tissue material properties and dynamic cell shape fluctuations and cellular rearrangements, potentially guided by FGF signaling. The intricate interplay between lumenogenesis, tissue mechanics and signaling provides a new dimension in understanding the design principles governing tissue self-organisation in embryonic development.



(2019, Chan CJ et al., Nature)

1. Chan CJ, et al., Hydraulic control of mammalian embryo size and cell fate. Nature (2019) 571:112-116.

2. Ryan AQ, Chan CJ, et al., Lumen expansion facilitates epiblast-primitive endoderm fate specification during mouse blastocyst formation. Developmental Cell (2019) 51, 1-14.

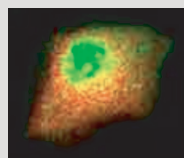
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