

# BDR SEMINAR via Zoom

## Tsuyoshi Hirashima

Graduate School of Medicine, Kyoto University

**Monday, September 7, 2020**

13:00-14:00

Meeting URL will be announced on the event day by e-mail.

※This seminar is open only to BDR members.

## Mechano-chemical feedbacks in multicellular tissues underlying pattern formation and morphogenesis

### Summary

How does a group of cells form complex patterns and architectures in a self-organized manner? To address this question, I have studied biophysical aspects of both the mechanical and biochemical regulations underlying multicellular tissue morphogenesis, using murine embryonic organs, live imaging, and mathematical modeling. In the seminar, I will focus on an interplay between active cellular forces and the mechano-sensitive MAP kinase ERK signaling, and provide several related topics including collective cell migration and branching morphogenesis. First, I will show a biophysical origin of collective cell migration and ERK activity waves in MDCK cells, and then discuss a close link to the cochlear duct development. Next, I will introduce a curvature-driven mechano-chemical feedback control exemplified in lung branching morphogenesis. Finally, I will talk a bit about the future extension, which hopefully enables us to integrate mechano-chemical feedbacks, multicellular pattern formation, and physiological function.



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