

BDR SEMINAR (Kobe & online hybrid)

Co-hosted by
Multimodal ECM Seminar



Transformative Research Area (A)
MULTIMODAL
ECM

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Friday, September 20, 2024

14:00-15:00

1F Auditorium, DB Building C, Kobe / Broadcast online via Zoom

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

※In principle, this seminar is open only to BDR members.

Understanding planar cell polarity with Xenopus and in vitro systems

Summary

Planar cell polarity (PCP) is coordinated orientation of cells in a tissue plane, which is established by asymmetric localizations of core PCP components. The secreted signaling protein, Wnt, directs PCP in vertebrates, and is believed to form a global gradient, because Wnt is regarded as a morphogen. However, the mechanism by which Wnt localizes core PCP components asymmetrically largely remain unknown. Moreover, there is no direct evidence for the presumed global gradient of Wnt in regulation of PCP. Here, we show that endogenous Wnt11 is polarized along with PCP in the neural plate of *Xenopus* embryos. Furthermore, we reveal that Wnt11 stabilizes asymmetric complexes of core PCP components bridging adjacent cells, and vice versa. Thus, Wnt11 and core PCP components compose multiple positive feedback loops to break symmetry of PCP. Our findings suggest that Wnt11 does not serve as a global cue for PCP, but that local interactions between Wnt11 and core PCP components can establish PCP in a self-organizing manner.

In addition, I will talk about dynamic pattern formation of heparan sulfate proteoglycans, which are a kind of ECMs with long and linear sugar chains, in the context of PCP formation, and will talk about in vitro formation of PCP with a cultured cell line.



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