

BDR SEMINAR via Zoom

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Monday, September 29, 2025

15:30-16:30

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

※This seminar is open only for BDR Members

Beyond Energy and Growth: A Signaling Role of Metabolism in Developmental Timing

Summary

How metabolism impacts cell fate decisions during development and disease is a fundamental yet unresolved question. It is increasingly recognized that metabolism plays an important role beyond fueling biological processes, regulating gene expression and signal transduction. However, due to its essential role in cellular homeostasis, it remains a key challenge to reveal how metabolism exerts a signaling function. To address this challenge, we are investigating the role of glycolysis using mouse embryo axis segmentation as an experimental model, which offers a unique opportunity to study the impact of metabolism on signaling in real time and in a quantitative manner. In this seminar, I will present our recent discovery that the glycolytic metabolite fructose 1,6-bisphosphate (FBP) has a noncanonical signaling role in embryo axis segmentation. We show that FBP controls the period of the segmentation clock – a molecular clock controlling periodic axis segmentation – via Wnt signaling. Critically, we provide evidence that this FBP-Wnt signaling axis can be decoupled from bioenergetic and biosynthetic roles of glycolysis. At the end of my talk, I will discuss potential mechanisms of this signaling axis and its implications for development in physiological contexts.