

BDR SEMINAR (Kobe/online hybrid)

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The Hakubi Center for Advanced Research, Kyoto University

Monday, April 11, 2022

15:00-16:00

1F Auditorium, DB Building C, Kobe / Broadcast online via Zoom
Zoom meeting URL will be announced on the event day by e-mail.

※This seminar is open only to BDR members.

In vitro reconstitution of the actin cytoskeletal dynamics

Summary

The actin cytoskeleton regulates various key functions of the cell, including division, motility, and polarity establishment. Ultrastructural and molecular biological studies over the several decades have revealed the nanoscale structures, molecular components, and signaling cascades regulating the actin cytoskeleton step by step. However, it remains unclear how nanometer-sized molecules are self-organized into cell-scale structures and how they cooperate to drive various cell functions. To understand the underlying physical principles that govern the cytoskeletal assembly and cell morphogenesis, we have adopted an in vitro reconstitution approach. We established a method to encapsulate purified proteins or the cytoplasmic extracts of living cells into cell-sized capsules. Using this minimal model of the cell, we are seeking the conditions in which structures and functions recapitulating living cells are self-organized. In this seminar, I will present recent studies aiming to understand the regulatory mechanisms of cell polarity and motility, then I will discuss our future directions.



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