BDR SEMINAR via Zoom

Naoko Irie

Wellcome Trust/Cancer Research UK Gurdon Institute,
University of Cambridge

Tuesday, September 29, 2020

15:30-16:30

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

※This seminar is open only to BDR members.

Uncovering the Molecular Program for Human Germ Cell Fate

Summary

How can germ cells, egg and sperm, maintain immortality over the generations by resetting totipotency? The early germ cell development demonstrates particularly unique events such as global epigenetic programming. However, to date, human germline research has been hampered by the lack of amenable experimental models due to the inaccessibility to human early embryos. To achieve a breakthrough, we established a robust cell culture model to recapitulate early germline development using human ES cells and iPS cells (Irie et al., Cell 2015). By combining an extensive characterization of in vivo human fetal germ cells, we identified SOX17 and BLIMP1 as essential transcription factors driving primordial germ cell specification. The cell fate decision was firmly regulated by the balance and the timing of the expression of SOX17 and BLIMP1. Notably, the involvement of SOX17 in early germline was observed in human, monkey and pig but not in mouse and rat, which might be due to the differences in early embryogenesis. These findings are now providing unprecedented opportunities to further explore human germ cell biology for elucidating human reproduction, germ cell disorders, as well as the transmission of genetic and epigenetic information that impacts on human health and evolution.

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RIKEN Center for Biosystems Dynamics Research (BDR)

Host: Mitsuru Morimoto
Laboratory for Lung Development and Regeneration, BDR
Contact: BDR Meeting Office
bdr-mtg@ml.riken.jp