

BDR SEMINAR via Zoom

Katsuhiko Hayashi

Department of Stem Cell Biology and Medicine,
Graduate School of Medical Sciences, Kyushu University

Friday, April 2, 2021

10:00-11:00

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

※This seminar is open only to BDR members.

Understanding mammalian oogenesis by reconstitution *in vitro*

Summary

The female germ line undergoes a unique sequence of differentiation processes that finally endows the egg with totipotency upon fertilization. The reconstitution *in vitro* of oogenesis using pluripotent stem cells, which eventually produces functional oocytes, has long been sought in reproductive biology and developmental biology, since it would contribute to not only a better understanding of mechanisms underlying totipotency, but also an alternative source of gametes for reproduction.

We developed a culture system that reconstituted the entire process of oogenesis from mouse pluripotent stem cells, yielding *in vitro*-generated eggs that were capable of full-term development. In the culture system, primordial germ cells were induced from ESCs/iPSCs, and then were aggregated with somatic cells of fetal ovaries. The aggregates, named reconstituted ovaries, passed through several culture stages, which in total took approximately 5 weeks. After these stages, a number of mature oocytes were produced in the reconstituted ovaries. This culture system is extremely useful, as genetic manipulation can be easily done in pluripotent stem cells, and outcome can be seen in culture. In the seminar, I will introduce recent advances in egg production from pluripotent stem cells and update current experiments to address molecular mechanisms underlying oocyte differentiation.



RIKEN Center for Biosystems Dynamics Research (BDR)

Host: Tomoya Kitajima

Laboratory for Chromosome Segregation, BDR

Contact: BDR Meeting Office

bdr-mtg@ml.riken.jp