BDR SEMINAR via Zoom

Kazuteru Hasegawa

Stanford Cancer Institute, Stanford University
(Laboratory of Dr. Steven E. Artandi)

Wednesday, September 16, 2020

9:30-10:30

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

※This seminar is open only to BDR members.

Clone wars: the emerging role of telomerase in stem cell competition

Summary

Tissue development and homeostasis are shaped by cell competition, a mechanism for culling unfit cells. During carcinogenesis, mutations in cancer genes confer a competitive growth advantage through an analogous process. Here, we show that the telomerase reverse transcriptase (TERT) is required for competitive clone formation in spermatogonial stem cells (SSCs). Using competitive lineage-tracing from the endogenous Tert locus, we find that TERT-expressing SSCs yield long-lived clones, but that selective TERT-deletion in SSCs disrupts clone formation by promoting differentiation. This requirement for TERT is independent of catalytic activity and the canonical telomerase complex. Loss of TERT induces a genome-wide reduction in open chromatin and causes reduced activity of the MYC oncogene. Transgenic expression of MYC in TERT-deleted SSCs rescues competitive clone formation. These data reveal an unexpected role for TERT in promoting stem cell competition, uncover a genetic link between TERT and MYC, and suggest new means by which TERT may delay aging and drive carcinogenesis.

Host: Tomoya Kitajima
Laboratory for Brain Chromosome Segregation, BDR
Contact: BDR Meeting Office
bdr-mtg@ml.riken.jp

RIKEN BDR

RIKEN Center for Biosystems Dynamics Research (BDR)