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**Thursday, July 18, 2024**

14:00-15:00

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

✧ Non-BDR members: Please register from the following link.

<https://krs2.riken.jp/m/bdrseminarregistration> (Registration deadline: July 16)

## The impact of transcription-mediated replication stress on genome instability and human disease

This seminar is a part of the BDR Stage Transition Project Seminar Series for 2024-2025.

### Summary

DNA replication is a vital process in all living organisms. At each cell division, > 30,000 replication origins are activated in a coordinated manner to ensure the duplication of > 6 billion base pairs of the human genome. During differentiation and development, this program must adapt to changes in chromatin organization and gene transcription: its deregulation can challenge genome stability, which is a leading cause of many diseases including cancers and neurological disorders. Over the past decade, great progress has been made to better understand the mechanisms of DNA replication regulation and how its deregulation challenges genome integrity and leads to human disease. Growing evidence shows that gene transcription has an essential role in shaping the landscape of genome replication, while it is also a major source of endogenous replication stress inducing genome instability. During my lecture, I will discuss the current knowledge on the various mechanisms by which gene transcription can impact on DNA replication, leading to genome instability and human disease.

### Recent key publications:

- Li J.\*, et al. (2023) The Human Pre-replication Complex is an Open Complex. *Cell*. 186:98-111.e21.
- Emerson D.\*, et al. (2022) Cohesin-mediated loop anchors confine the location of human replication origins. *Nature*. 606:812–819.
- Gnan S., et al. (2022) Kronos scRT: a uniform framework for single-cell replication timing analysis. *Nat. Commun*. 13:2329.
- Wang W\*, et al. (2021) Genome-Wide Mapping of Human DNA Replication by Optical Replication Mapping Supports a Stochastic Model of Eukaryotic Replication. *Mol. Cell*. 81:2975-2988.e6.
- Promonet A.\*, et al. (2020) Topoisomerase 1 prevents replication stress at R-loop-enriched transcription termination sites. *Nat. Commun*. 11:3940.