NUS National University of Singapore

Infectious Diseases Translational Research Programme
Yong Loo Lin School of Medicine

Chromosome organization and segregation in *Bacillus subtilis* and *Agrobacterium tumefaciens*



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Date: Tuesday, 26 October 2021
Time: 11:00 AM SGT / 11:00 PM EDT

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ABSTRACT

Chromosome compaction, organization and faithful segregation is fundamental to the life process. This work focuses on how chromosome is organized and segregated in bacteria. We primarily use *Bacillus subtilis* as a model but recently extend our analyses to *Agrobacterium tumefaciens,* which has a circular chromosome, a linear chromosome and two large plasmids. We combine genetics, fluorescence microscopy and genomic approaches such as Chromosome Conformation Capture (Hi-C) and Chromatin Immunoprecipitation (ChIP-seq) to study the role of the highly conserved partitioning system and the SMC condensin complex in chromosome segregation and maintenance.

PUBLICATIONS

1. *†Yang, C-K., Kashyap, D.R., Kowalczyk, D.A., Rudner, D.Z., Wang, X., Gupta, D., Dziarski, R. **2021.** Respiratory chain components are required for peptidoglycan recognition protein induced thiol depletion and killing in *Bacillus subtilis* and *Escherichia coli*. Scientific Reports.11(1):64.
2. *†Karaboja, X., Ren, Z., Brandão, H.B., Paul, P., Rudner‡, D.Z., Wang‡, X. **2021.** XerD is required to unload bacterial SMC complexes at the replication terminus. Mol. Cell. 81(4):756-766 (‡corresponding authors)
3. *†Brandão, H.B., Ren, Z., Karaboja, X., Mirny‡, L.A., Wang‡, X., **2021**. DNA-loop extruding SMC complexes can traverse one another *in vivo*. Nat. Struct. Mol. Biol. 28: 642-651https://doi.org/10.1038/s41594-021-00626-1 (‡corresponding authors)