

第2回 RcMcD 融合研究セミナー (5研究科共同セミナー)

演 題 : **Driven anomalous diffusion: A model for chromosome segregation?**

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日 時 : 平成27年5月14日 (木)

14:35~16:05

場 所 : 広島大学理学部 E002 講義室

【Abstract】

The cell division is a dynamic process, which involves the partitioning of chromosomes and their copies into daughter cells. One way to access this complex biological process is to label a particular locus, and track its biased stochastic motion. There is indeed a recent attempt to track the motion of the origin of replication (*oriC*) during the segregation process of bacterial chromosome, and analyze it based on the simple polymer physics model [1].

In this talk, I will summarize basic aspects of polymer dynamics, in particular, the anomalous drift and diffusion of a tagged monomer, the viscoelastic response and associated memory effect, which are relevant to the analysis[2,3]. I will try to provide an intuitive picture on how and why the motion of a tagged monomer in a long polymer is anomalous, and how it resembles to the motion of chromosome locus. Finally, I would like to discuss what we can get from this sort of analysis on the chromosome segregation.

References

- 1) “Physical Modeling of Chromosome Segregation in *Escherichia coli* Reveals Impact of Force and DNA Relaxation”, T.J. Lampo et. al., *Biophysic. J.* 108, 146 (2015).
- 2) “Dragging a Polymer in a Viscous Fluid: Steady State and Transient”
T. Sakaue, T. Saito and H. Wada, *Phys. Rev. E* 86, 011804 (2012).
- 3) “Driven Anomalous Diffusion: An Example from Polymer Stretching”
T. Saito and T. Sakaue, submitted