

生物物理学セミナー

GIC seminar

Dr. Takashi Akera

Laboratory of Chromosome Dynamics and Evolution, NIH

The impact of non-Mendelian transmission on reproduction and speciation

～メンデルの法則に反する遺伝様式が有性生殖と種分化に与える影響～

Mendel's Law of Segregation states that each allele has an equal chance to transmit to the next generation. However, this law can be violated by selfish genetic elements, which manipulate the production of gametes (e.g., eggs, sperm) to increase their own transmission rate. This genetic cheating in meiosis, meiotic drive, has significant impacts on Genetics, Evolution, and Reproduction because the cheating alters transmission ratios and manipulates gametogenesis, often leading to fertility issues and genetic disorders (e.g., Down Syndrome). In female meiosis, selfish elements bias their transmission by preferentially segregating to the egg. However, it remains largely unknown how these elements bias their segregation to the egg especially in animals. My lab uses mouse models and cell biological approaches to visualize selfish elements to reveal how these elements manipulate female meiosis to preferentially segregate to the egg. I will discuss our recent findings on the mechanisms of meiotic drive and how it impacts mammalian reproduction and speciation.

References:

Clark FE, Greenberg NL, Silva DMZA, Trimm E, Skinner M, Rosin LF, Lampson MA, Akera T. An egg sabotaging mechanism drives non-Mendelian transmission in mice. *Curr Biol*. 9;34(17):3845-3854 (2024)

El Yakoubi W, Akera T. Condensin dysfunction is a reproductive isolating barrier in mice. *Nature* 623(7986):347-355 (2023)

理学研究科1号館 **5階 小会議室 1**

(525・527号室)

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