

# 2020 年度 第4回 生命科学技術国際卓越講義

World-leading Innovative Lectures  
in Life Science & Technology  
The University of Tokyo



## Epigenetically activated small RNAs are modified in pollen and mediate chromosome segregation and dosage

**Robert Martienssen**

Professor, Howard Hughes Medical Institute, Cold Spring Harbor Laboratory

**Date:** 2nd, March, 2021

**Time:** 9:00AM ~ 10:30AM

**Venue:** Zoom (meeting URL will be sent after registering)

**Participants:** Up to 500 participants



Please register by this QR code or clicking the following link

[Registration Form](#) 参加登録フォーム



**Abstract:** Chromosome dosage plays a significant role in reproductive isolation and speciation in both plants and animals, but underlying mechanisms are largely obscure. We have found that a highly conserved microRNA in plants, miR845, targets the tRNAMet primer-binding site (PBS) of LTR-retrotransposons in Arabidopsis pollen, and triggers the accumulation of 21 to 22-nucleotide small RNA in a dose dependent fashion via RNA polymerase IV. We show that these epigenetically activated small-interfering RNAs (easiRNAs) mediate hybridization barriers between diploid seed parents and tetraploid pollen parents (“the triploid block”), and that natural variation for miR845 may account for “endosperm balance” allowing formation of triploid seeds. Targeting the PBS with small RNA is a common mechanism for transposon control in mammals and plants, and provides a uniquely sensitive means to monitor chromosome dosage and imprinting in the developing seed. Loss of easiRNAs in DNA methylation mutants results in severe mitotic chromosome mis-segregation, strongly reminiscent of RNAi mutants in *S.pombe*, which lacks DNA methylation. We have found that easiRNA are specifically modified in pollen, along with certain miRNA. We are determining the biogenesis and function of these modifications.

**Organizer:** World-leading Innovative Graduate Study Program for Life Science and Technology

**Cooperation:** Graduate Program for Leaders in Life Innovation, The University of Tokyo

For Further Information Contact: Nana Sekine at WINGS-LST Office

Phone: 03-5841-0246

E-mail: wings-life@m.u-tokyo.ac.jp