

**Spatial control of
ARGONAUTE-mediated RNA silencing
in male organ developments****Reina Komiya**(Okinawa Institute of Science and
Technology Graduate University (OIST))**Initiation of meiotic recombination in
zebrafish****Yukiko Imai**

(National Institute of Genetics)

**2023.1.30 (Mon)****13:00-14:00 JST**

← via Zoom Register here

<https://riken-jp.zoom.us/meeting/register/tJMcuytpz0jHdEAT1Bryo-sSFmGWgdPL18S>**Spatial control of ARGONAUTE-mediated RNA silencing in male organ developments**

Argonaute protein (AGO) in association with small RNAs is the core machinery of RNA silencing, an essential mechanism for precise development and defense against pathogens in many organisms. We identified two stamen-specific AGOs (Nature communications, 2020), that interact with small RNAs derived from reproductive-specific long NON-coding RNAs in rice.

Recently, we successfully developed a 3D multiple immunofluorescence technique with single-cell and intracellular resolution for a male organ, stamen (Scientific Reports 2022). The 3D-immunofluorescence and mutant analysis demonstrated that these stamen AGOs redundantly and cell type-specifically regulate stamen development. In the WFS seminar, I will introduce the stamen-specific small RNA biogenesis, and a new mode of RNA silencing via the specific nuclear and cytoplasmic localization of three AGOs, AGO1b, AGO1d, and MEL1 in rice pollen mother cells.

Initiation of meiotic recombination in zebrafish

In meiosis, a single round of DNA replication is followed by two sequential rounds of segregation, to produce haploid gametes with half the chromosome number of the diploid parent cell. Homologous recombination during meiosis generates reciprocal exchanges between homologous chromosomes that are essential for proper chromosome segregation. Meiotic recombination is known to be enriched at particular regions of a genome, called hotspots. Curiously, recombination hotspots vary among species. However, the current understanding of its molecular basis is limited to a few model organisms. We focused on zebrafish males, in which recombination occurs preferentially in distal regions of the chromosomes, as a new model organism to study meiosis. We have characterized mutant lines that are defective in the formation of meiotic chromosome structures. In this presentation, I will first introduce how meiotic recombination progresses in zebrafish based on these mutant phenotypes. In the second half of my talk, I would like to discuss how meiotic recombination could be directed to the distal chromosomal regions.