

SEMINAR

ALL ARE WELCOME



*Scan for address

5 Jun 2023 (Mon), 11am
Seminar Rm 05-41 (Level 5)

Hosted by: Dr PEK Jun Wei

Tejas functions as a core component in nuage assembly and precursor processing in *Drosophila* piRNA biogenesis

Prof Toshie KAI

Osaka University, Japan



After having PhD in 1998, Prof. Kai went on a postdoctoral career in Dr. Allan Spradling's lab at Carnegie Institution of Washington in USA. In 2005, she set up her own lab in TLL, Singapore. She also served as Associate Prof in DBS NUS. In 2015, she moved her lab to Japan, at Graduate School of Frontier Bioscience, Osaka University.

PIWI-interacting RNAs (piRNAs) which protect genome from the attack by transposons, are produced and amplified in membrane-less granules called nuage. In *Drosophila*, PIWI family proteins, Tudor-domain-containing proteins, and RNA helicases are assembled and form nuage to ensure piRNA production. Among them, the molecular functions of Tejas (Tej) in piRNA biogenesis remain unknown. Here, detailed analysis of the subcellular localization of fluorescently-tagged nuage proteins and behavior of piRNA precursors reveals Tej plays a role for piRNA precursor processing and assembly of other nuage components, Vasa and Spindle-E. Tej functions as a core component recruiting Vasa and Spindle-E into nuage granules through distinct motifs, assembling nuage and engaging precursors for further processing. Our study also reveals that the low-complexity region of Tej regulates the mobility of assembled nuage by phase separation. We propose that Tej plays a pivotal role in piRNA precursor processing by assembling Vasa and Spindle-E into nuage and modulating mobility of the nuage components.

Recent Publications:

1. Lim L-X, *Isshiki W, Iki T, Kawaguchi S, **Kai T.** (2022) The Tudor-domain containing protein, Kotsubu (CG9925), localizes to the nuage and functions in piRNA biogenesis in *D. melanogaster*. *Frontiers in Molecular Biosciences (section RNA Networks and Biology)* **9**:Article 818302 *Co-first authors · doi: [10.3389/fmolb.2022.818302](https://doi.org/10.3389/fmolb.2022.818302)
2. Iki T, Takami M, ***Kai T.** (2020) Modulation of Ago2 Loading by Cyclophilin 40 Endows a Unique Repertoire of Functional miRNAs during Sperm Maturation in *Drosophila*. *Cell Reports* **33**(6):108380–108393 *Co-corresponding · doi: [10.1016/j.celrep.2020.108380](https://doi.org/10.1016/j.celrep.2020.108380)
3. Teo RYW, Anand A, Sridhar V, Okamura K, **Kai T.** (2018) Heterochromatin protein 1a functions for piRNA biogenesis predominantly from pericentric and telomeric regions in *Drosophila*. *Nat. Commun.* **9**:1735 · doi: [10.1038/s41467-018-03908-3](https://doi.org/10.1038/s41467-018-03908-3)