

# SEMINAR

## ALL ARE WELCOME



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**24 Oct 2023 (Tue), 3.30pm**

**Auditorium (Level 1)**

**Hosted by: Dr ONG Chin Tong**

### **Collective induction of oogenesis via long-range cytoplasmic streaming in *C. elegans***

**Dr Fumio MOTEKI**

**Hokkaido University, Japan**



Dr Fumio completed his doctoral degree at the University of Tokyo. He did his postdoctoral work at RIKEN and Johns Hopkins University. He joined TLL and MBI as a Principal Investigator in 2012 and holds a joint appointment as an Assistant Professor at DBS, NUS. He was appointed as a Professor at Institute for Genetic Medicine, Hokkaido University in Oct 2020.

The successful production of gametes is a critical prerequisite for organisms to generate offspring. During oogenesis, germ cells undergo enlargement through cytoplasmic exchange through intracellular bridges with neighbouring cells. The process of pro-oocyte enlargement involves dynamic reorganization of the plasma membrane and apoptosis of adjacent germ cells, although the precise role of cytoplasmic exchange remains incompletely elucidated. In this study, we investigated the mechanisms underlying oogenesis in *C. elegans* and found that cytoplasmic streaming from distal germ cells towards pro-oocytes is mediated through collective suction of the cytoplasm by oocytes on the external surface of the U-shaped tube. Our findings support a model of non-cell-autonomous induction of oogenesis, where long-range streaming of the cytoplasm contributes to oogenesis by promoting anisotropic expansion of pro-oocytes adjacent to enlarging oocytes.

#### **Recent Publications:**

1. Lim, Y. W., Wen, F. L., Shankar, P., Shibata, T., & **Motegi, F.** (2021). A balance between antagonizing PAR proteins specifies the pattern of asymmetric and symmetric divisions in *C. elegans* embryogenesis. *Cell Reports*, 36(1).
2. Zhao, P., Teng, X., Tantirimudalige, S. N., Nishikawa, M., Wohland, T., Toyama, Y., & **Motegi, F.** (2019). Aurora-A breaks symmetry in contractile actomyosin networks independently of its role in centrosome maturation. *Developmental cell*, 48(5), 631-645.
3. Ramanujam, R., Han, Z., Zhang, Z., Kanchanawong, P., & **Motegi, F.** (2018). Establishment of the PAR-1 cortical gradient by the aPKC-PRBH circuit. *Nature chemical biology*, 14(10), 917-927.