

**An introduction of pheromone function during conjugation in ciliates:
insights from *Blepharisma* and *Tetrahymena***

Ruitao Gong

Ciliates exhibit a remarkable nuclear dualism, possessing a germline micronucleus (MIC) and a somatic macronucleus (MAC), which together enable complex regulation of genetic information. Conjugation is a specialized sexual process in ciliates that involves extensive nuclear reorganization, including genome rearrangement and programmed DNA elimination. In addition, exocrine pheromones play a crucial role in conjugation initiation and mating type recognition.

In this seminar, I will briefly introduce these fundamental features and present our work in *Blepharisma sinuosum* and *Tetrahymena thermophila*. In *B. sinuosum*, we refined the predicted biosynthetic pathway of Gamone 2 and analyzed the expression patterns of candidate enzymes. Additionally, immunostaining experiments were performed to localize Gamone 1.

In *T. thermophila*, although exocrine pheromones have not been widely recognized, previous studies suggest the secretion of factors that promote conjugation initiation. We performed secretome analysis during starvation and early conjugation, combined with transcriptomic data to identify candidate molecules. In parallel, transcriptomic data were analyzed to identify enzymes specifically upregulated at early stages of conjugation that may be involved in their biosynthesis. Functional characterization of a candidate enzyme (MAO2) was carried out through gene knockout and validation experiments.