NUS National University of Singapore | Department of Biological Sciences
Faculty of Science

SEMINAR

Thurs, 18 Apr 2024 | 10 am | DBS Conference Room 1

Hosted by Assoc Prof Lau On Sun

Leaf epidermal patterning and fate determination

By **Chin-Min Kimmy Ho**

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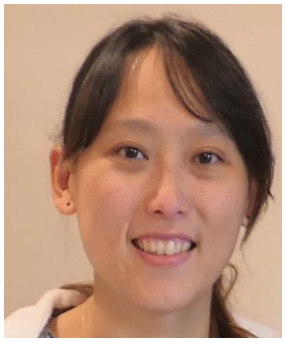
Leaf epidermis is composed of highly coordinated and functionally distinct cell types including stomata, microscopic pores on the epidermis for photosynthesis, trichomes, epidermal hairs to prevent insect attacks and jigsaw-shaped pavement cells as building blocks for leaf integrity. The cuticle layers on top of the pavement cells together with stomata balance the trade-off between gas exchange and water loss. While much has been learned from genetic dissection of stomatal and trichome development, little is known about what influences an epidermal initial cell to decide its cell fate. Using epidermal cell-type-specific markers combined with fluorescence-activated cell sorting (FACS), I was able to identify the transcriptome signatures of stomatal lineage ground cells (SLGCs) which have the ability to either undergo cell division or cell differentiation, representing the epidermal initial cells. Further investigation using genes enriched in the SLGC list, we found cutin biosynthesis needs to be shut down during stomatal development to maintain the proper stomatal pattern, illustrating the biochemical signaling and mechanical properties are integrated to form a functional tissue. In addition, by analyzing the function of a previously uncharacterized homeodomain-containing protein, we found chromatin organization influences a cell state switching from proliferation to differentiation, thereby, rewiring leaf epidermal pattern.



About the Speaker

Kimmy Ho is an associate research fellow at the Institute of Plant and Microbial Biology, Academia Sinica. She trained in Biochemistry and Molecular Biology and received her Ph.D. at UC Davis. She obtained her postdoc training at Stanford University and established a research group at Academia Sinica in 2018. She leads a team that focuses on leaf epidermal development. In 2024, she was selected as a member of the EMBO global investigators.