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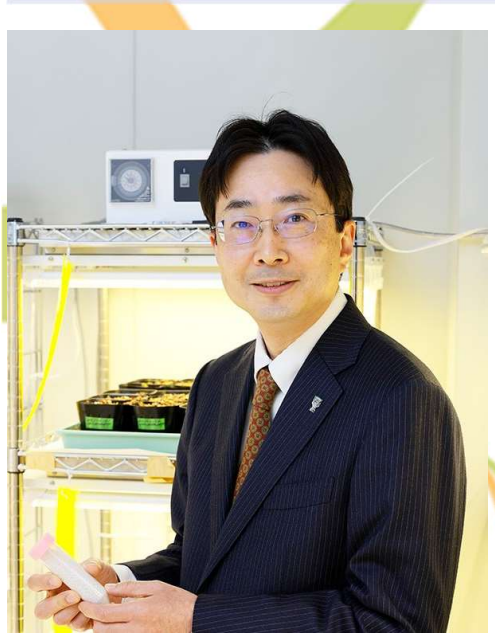
19 Feb 2024 (Mon), 4pm

The Auditorium (Level 1)

Hosted by: Dr YIN Zhongchao

Deciphering Plant Reproduction: The Role of AGAMOUS in Hermaphroditic Strategies

Dr Toshiro ITO
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Dr Toshiro Ito received his Ph.D. from Kyoto University, Japan and worked for California Institute of Technology, USA as a postdoctoral fellow (1997-2003) and as a senior research fellow (2003-2005). He worked for Temasek Life Sciences Laboratory, Singapore (2005-2017) to lead the Plant Systems Biology Group. In 2015, he started the Plant Stem Cell Regulation and Floral Patterning Laboratory in Nara Institute of Science and Technology, Japan.

Plants have a unique reproductive strategy where both male and female organs coexist in one flower. This hermaphroditism helps sessile plants reproduce without needing separate partners. Although self-fertilization is efficient, cross-fertilization is essential for maintaining genetic diversity and preventing the accumulation of harmful mutations. Plants have evolved various mechanisms, notably utilizing insects for cross-pollination, attracting them with sweet nectar and colorful petals. In this seminar, we will explore the significant role of the AGAMOUS (AG) gene in reproductive strategies. AG, a key reproductive organ identity gene, is responsible for integrating stem cell regulation with the development of reproductive organs. Its continued activity is essential during reproductive development. Our recent studies reveal AG's role in nectary formation and petal senescence, providing insights into its role in enhancing efficient pollination and optimizing resource allocation for reproductive success. The seminar aims to dissect how AG contributes to these sophisticated reproductive mechanisms in plants.

Recent publications:

1. Pelayo M A, Morishita F, Sawada H, Matsushita K, Iimura H, He Z, Looi L S, Katagiri N, Nagamori A, Suzuki T, Širl M, Soukup A, Satake A, Ito T*, Yamaguchi N*, (2023) “AGAMOUS regulates various target genes via cell cycle-coupled H3K27me3 dilution in floral meristems and stamens.” Plant Cell, 35: 2821-2847
2. Fujii S, Yamamoto E, Ito S, Tangpranomkorn S, Kimura Y, Miura H, Yamaguchi N, Kato Y, Niidome M, Yoshida Aya, Shimosato-Asano H, Wada Y, Ito T, Takayama S, (2023)“SHI family transcription factors regulate an interspecific barrier”, Nature Plants, 9: 1862–1873
3. Wang,Y., Shirakawa, M., and Ito T*. (2022) “Arrest, Senescence, and Death of Shoot Apical Stem Cells in Arabidopsis thaliana.”, Plant and Cell Physiology, 64: 284-290