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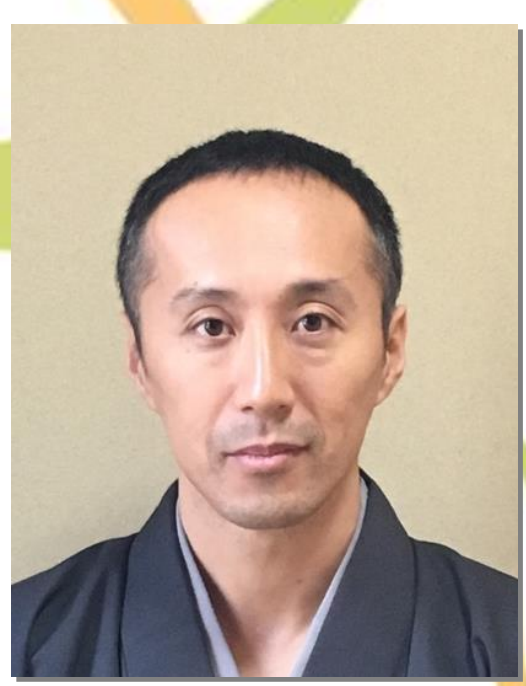
TEMASEK LIFESCIENCES LABORATORY

31 October 2019 (Thursday), 3.30pm
The Auditorium (Level 1)

Hosted by: Dr Fumio Motegi

Plant cell division: How different from animal cells?

Prof. Gohta GOSHIMA
Nagoya University, Japan



Gohta Goshima is a Professor in Division of Biological Science at Nagoya University (Japan). His laboratory is studying intracellular dynamics, in particular cell division and other processes controlled by the microtubule cytoskeleton in animal and plant cells.

Textbooks often describe the plant mitotic spindle in a section separate from the animal mitotic spindle. This is understandable, since they look very different: unlike the animal spindle, the plant spindle has no centrosomes, and the plant cell assembles a unique structure called 'phragmoplast' in anaphase. How do the two spindles differ at the molecular and mechanistic levels? While this question seems obvious, it has proven to be difficult to address, largely due to extensive gene redundancy and the lack of 'HeLa' or '*C. elegans*' type of model systems in plants. Our laboratory began to study plant cell division ~10 years ago using an emerging model plant, the moss *Physcomitrella patens*. In *P. patens*, various genetic tools and microscopy techniques have been developed, such as conditional RNAi, multi-gene disruption using CRISPR/Cas9, and oblique illumination fluorescence microscopy to image cytoskeletal dynamics without the interference of chloroplast autofluorescence. Our series of reverse genetics studies on conserved mitotic genes have elucidated both common and unique features of plant cell division. In this presentation, I will focus on two recent studies: one on kinetochores and its unexpected link to ploidy maintenance, and the other on spindle orientation and positioning without centrosomes.

Recent Publications:

1. Kozgunova E, Nishina M, **Goshima G.** (2019) Kinetochore protein depletion underlies cytokinesis failure and somatic polyploidization in the moss Physcomitrella patens. eLife pii:e436522.
2. Edzuka T, **Goshima G.** (2019) Drosophila kinesin-8 stabilizes the kinetochore–microtubule interaction. J Cell Biol. 218(2):474-488
3. Takeda A, Saitoh, S, Ohkura, H, Sawin KE, **Goshima G.** (2019) Identification of 15 new bypassable essential genes of fission yeast. bioRxiv