Identification of novel regulators involved in stem cell fate transition in the moss *Physcomitrium patens*

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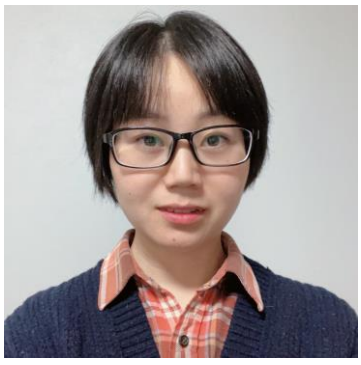
Stem cell fate transition is crucial for the development of both land plants and metazoans. In the moss *Physcomitrium patens*, transition from vegetative gametophore stem cell to reproductive antheridium initial stem cells can be triggered by low temperature and short daylength conditions. This feature is suitable to elucidate the molecular mechanism underlying the stem cell fate transition triggered by environmental cues. Here, we first analyzed whether low temperature or short daylength can independently trigger the stem cell fate transition. Next, we asked the involvement of EARLY FLOWERING 3 (ELF3), PHYTOCHROME INTERACTING FACTOR 4 (PIF4) and the histone variant H2A.Z, which have been reported as thermosensors or clock regulators in flowering plants, in the stem cell fate transition. In *P. patens*, four *ELF3*, four *PIF4*, and three *H2A.Z* orthologs were identified through our phylogenetic analysis. To investigate their role in the transition process, multiple higher-order mutants have been obtained by CRISPR-Cas9 system. Observation of these mutant phenotype during the stem cell fate transition is now ongoing. Establishment of knock-in lines of *mCitrine* into each of *PpELF3*, *PpPIF4* and *PpH2A.Z* loci is also in progress for understanding the spatiotemporal dynamics. In this presentation, we will report our latest results.

Short biography:



Changxiu Yu is now a PhD student in Graduate School of Regional Development and Creativity, Utsunomiya University. She received her master degree of cell biology from Huazhong Agricultural University, China in June 2019. Her research interest is understanding the molecular mechanisms underlying the fate transition from vegetative stem cell to reproductive stem cell in moss *Physcomitrium patens*.