CDB SEMINAR

Speaker: **Toshiro Ito**

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Title:

"Downstream functions of the floral homeotic protein AGAMOUS in *Arabidopsis*"

Date:	Friday, December 17
Time:	16:30 -17:30
Place:	7F Conference Room of Building A,CDB

Summary:

In the field of developmental biology, animals and plants are considered to have evolved the multicellular developmental process independently. Plant organogenesis depends almost entirely on the control of cell divisions, while animals use the mechanisms of cell migration and cell-cell adhesion. However, in both animals and plants, organ identities are specified by the activities of homeotic genes. In both kingdoms, the homeotic genes encode transcriptional regulators. Comparison of downstream functions of homeotic proteins in the two kingdoms will help us to fully understand the logic of multicellular developmental process. However, the downstream functions of homeotic proteins are poorly understood in both kingdoms.

To reveal the transcriptional network from homeotic genes to genes leading to morphogenesis in plants, I have been working on target genes of the floral homeotic protein AGAMOUS (AG) in the model plant *Arabidopsis*. AG is necessary for the reproductive organ development. By using microarrays and an inducible version of AG, we identified several AG-responsive genes. Out of those genes, I showed that AG directly regulates the transcription of key transcriptional regulator SPOROCYTELESS that has the essential function in pollen and ovule formation. This is the first evidence of a genetic mechanism linking the homeotic genes controlling floral organ identity and the initiation of the gametophytic phase.

I will also introduce another AG target gene identified by bioinformatics approach. I showed that the direct AG target GIANT KILLER, AT-hook type DNA binding protein, regulates the expression of a gene controlling the polarity of carpels (female reproductive organ).

Lastly I would like to discuss the homeotic function in plants from an evolutionary perspective.

Reference: Ito et al. Nature, 430, 356-360 (2004)

-Host-

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