The contribution of the 'antiflorigen' TFL1 to inflorescencearchitecture

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Like its close homolog FLOWERING LOCUS T (FT), TERMINAL FLOWER 1 (TFL1) is a small mobile protein. However unlike FT, which is an activator of flowering, TFL1 negatively inpacts the switch to flower formation. Moreover, recent data has suggested that while FT acts predominantly as a co-activator, TFL1 likely acts as a co-repressor (Hanano S., Goto K. 2011). Confirmation of this hypothesis awaits identification of immediate early target genes of TFL1. Here we provide evidence that TFL1 executes its critical role in control of inflorescence architecture in large part via repression of the floral fate promoting *LEAFY* gene. TFL1, like FT, is thought to be recruited to its target loci via the bZIP transcription factor FD. On the basis of chromatin immunoprecipitation (ChIP), TFL1 and FD bind to evolutionarily conserved bZIP binding sites at the *LFY* locus and TFL1 association with this region is reduced in the *fd* mutant. A *LFY* reporter that does not contain the bZIP binding sites displays ectopic expression. Finally, inducible activation of TFL1 led to decreased *LFY* accumulation. Our data support the idea that TFL1 represses its immediate early target genes. It also fits well with prior genetic studies, which had revealed that *tfl1* loss-of-function mutants phenocopy *LFY* gain-of-function mutants and vice versa. Moreover, *TFL1* and *LFY* expression is largely non-overlapping. Further studies are aimed at precise placement of TFL1 in the regulatory network that controls proper timing of flower formation.

categories: Development/reproductive and flowering

References:

Hanano S. and Goto K. (2011) *Arabidopsis* TERMINAL FLOWER1 Is Involved in the Regulation of Flowering Time and Inflorescence Development through Transcriptional Repression Plant Cell 23 (9) 3172-3184.