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The timing of flowering is crucial in determining the final production of seeds and fruits. In plants the transition from vegetative growth to flowering is regulated by several environmental stimuli and by the age of the individual. This complexity is conferred by a network of genetic pathways that has been characterized best in the model species *Arabidopsis thaliana*. *FLOWERING LOCUS T* (*FT*) is a positive regulator of flowering which participates in different genetic pathways, such as vernalisation, thermosensory, gibberellin (GA) and potoperiod. In Arabidopsis, *FT* is induced by long days and has been placed at the core of the photoperiodic pathway, downstream of the *GIGANTEA* (*GI*) and *CONSTANS* (*CO*) genes. Under LDs, FT protein is transported from the leaves to the shoot apical meristem (SAM) where it induces the expression of several floral promoter genes (reviewed in Andrés and Coupland (2012)). Interestingly, recent studies have shown that GA also induces flowering at the SAM under LDs and plays an important role in the FT-mediated transcriptional activation of floral promoter genes. However, how the photoperiod and the GA signaling pathways are coordinated at the SAM to promote flowering is still unclear. The Arabidopsis MADS-box gene SHORT VEGETATIVE PHASE (SVP) is a well-known floral repressor which mRNA expression is reduced in the SAM by the action of the photoperiod signals, mainly represented by FT protein. We have performed ChIP-seq and expression analysis which resulted in the identification of genes and pathways regulated by SVP (Gregis *et al*., 2013). These analyses revealed an unexpected role of SVP in regulating components of different hormonal biosynthetic and signaling pathways, such as cytokinin and GA pathways. Remarkably, we found that the expression of *GA20ox2*, a gene encoding a rate-limiting enzyme in GA biosynthesis, is repressed by SVP. Up-regulation of *GA20ox2* mRNA in the *svp-41* mutant leads to elevated levels of GA that correlate with GA-related phenotypes such as early flowering and organ elongation (Andrés *et al*, submitted). Taking our results together, we propose that inductive LD conditions contribute to the reduction of *SVP* expression in the shoot apex which in turn, allows the de-repression of the gibberellin pathway and therefore accelerates the floral transition process.

References:

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