

Arabidopsis BLADE-ON-PETIOLE1 and 2 promote floral meristem fate and determinacy in a previously undefined pathway targeting APETALA1 and AGAMOUS-LIKE24.

Xu M, Hu T, McKim SM, Murmu J, Haughn GW, Hepworth SR.

Source

Department of Biology, Carleton University, Ottawa, Ontario, K1S 5B6, Canada.

Abstract

The transition to flowering is a tightly controlled developmental decision in plants. In Arabidopsis, LEAFY (LFY) and APETALA1 (AP1) are key regulators of this transition and expression of these genes in primordia produced by the inflorescence meristem confers floral fate. Here, we examine the role of architectural regulators BLADE-ON-PETIOLE1 (BOP1) and BOP2 in promotion of floral meristem identity. Loss-of-function *bop1 bop2* mutants show subtle defects in inflorescence and floral architecture but in combination with *lfy* or *ap1*, synergistic defects in floral meristem fate and determinacy are revealed. The most dramatic changes occur in *bop1 bop2 ap1-1* triple mutants where flowers are converted into highly branched inflorescence-like shoots. Our data show that BOP1/2 function distinctly from LFY to upregulate AP1 in floral primordia and that all three activities converge to down-regulate flowering-time regulators including AGAMOUS-LIKE24 in stage 2 floral meristems. Subsequently, BOP1/2 promote A-class floral-organ patterning in parallel with LFY and AP1. Genetic and biochemical evidence support the model that BOP1/2 are recruited to the promoter of AP1 through direct interactions with TGA bZIP transcription factors, including PERIANTHIA. These data reveal an important supporting role for BOP1/2 in remodeling shoot architecture during the floral transition.