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Conserved principles of plant development

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Abstract Title: Molecular mechanisms of BASIC PENTACYSSTEINE PROTEINS (BPCs) and the MADS-box factor SVP in the regulation of homeotic genes in Arabidopsis

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Abstract

The Arabidopsis transcription factor BPCs family is composed of seven members divided into three classes, based on their protein sequence similarity. BPCs bind the regulatory sequence of the homeotic gene SEEDSTICK (STK) promoter together with the MADS-box factor SHORT VEGETATIVE PHASE (SVP). We show that MADS-box binding sites on the STK promoter region are necessary for STK correct spatial expression. To study the contribution of BPCs of class II to the regulation of the homeotic gene we generated the quintuple *bpc12346* mutant. Through ChIP experiments, we found that SVP binds the genomic region of STK even in the absence of BPCs, whereas BPCs need SVP for the binding of the STK promoter. Besides, BPCs mutations affect STK expression in the flower. Moreover we analyzed the repressive trimethylation mark at Lys-27 in histone H3 in STK regulatory regions and we found that it's reduced in *bpc12346* mutant suggesting a direct role of chromatin modification in the regulation of STK expression mediated by BPCs. Our results provide insights into the molecular mechanisms that drive transcription regulation in plants and investigate the involvement of a protein complex in which BPCs and MADS-box might cooperate to regulate the expression of homeotic genes during development.