MAKING A FLOWER: MOLECULAR MECHANISMS CONTROLLING EARLY STAGES OF FLOWER DEVELOPMENT

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The formation of flowers starts when floral meristems develop on the flanks of the inflorescence meristem. In Arabidopsis the identity of floral meristems is promoted and maintained by APETALA1 (AP1) and CAULIFLOWER (CAL). In the ap1 cal double mutant the meristems that develop on the flanks of the inflorescence meristem are unable to establish floral meristem identity and develop as inflorescence meristems on which subsequently new inflorescence meristems proliferate forming a cauliflower like curd.

By performing a genome wide analysis of the Arabidopsis MADS-box transcription factor family and a matrix based MADS-box transcription factor interaction study we identified two candidate genes, AGAMOUS-LIKE 24 (AGL24) and SHORT VEGETATIVE PHASE (SVP), for the control of floral meristem identity. We demonstrated, in contrast to previous models, that AGAMOUS-LIKE 24 (AGL24) and SHORT VEGETATIVE PHASE (SVP) are indeed floral meristem identity genes since the ap1-10 agl24-2 svp-41 triple mutant continuously produces inflorescence meristems in place of flowers. We will further show that AP1, AGL24 and SVP directly regulate genes that control the formation of floral organs. We are now combining Chromatin Immuno Precipitation with deep sequencing (ChIP-seq) to identify the genome-wide targets of SVP, the first results will be presented.