



ABSTRACT

“POLYCOMB and THRITHORAX regulate MADS-family transcription factor genes to ensure plant reproduction”

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Despite the difference in sequence and structure, many plant MADS-box genes including *FLOWERING LOCUS C (FLC)*, like animal homeotic (*HOX*) genes, are controlled by factors belonging to Polycomb group (PcG) and Trithorax group (TrxG). Several PcG and TrxG genes are involved in *FLC* transcriptional regulation and in several cases chromatin remodeling by histone covalent modifications (methylation and monoubiquitylation) is characterized in detail, making *FLC* one of the most studied loci in current topic of epigenetic research. Our more recent data identified new MADS-box genes as being embedded in a ‘bivalent domain’ chromatin enriched for both the active mark H3K4-trimethylation and the repressive mark H3K27-trimethylation. Through regulation of MADS-family genes PcG and TrxG play crucial roles in control of transition of stem cells from vegetative to reproductive growth (flowering) and in regulation of gametophyte development.