

GUARD CELLS: TRANSCRIPTION FACTORS REGULATE STOMATAL MOVEMENTS AND WATER LOSS

E. COMINELLI, M. GALBIATI, T. SALA, C. TONELLI

Department of Biomolecular Sciences and Biotechnology, University of Milan, Via Celoria 26, 20133 Milano, Italy

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The regulation of the opening of stomata allows the plant to cope with the conflicting needs of ensuring a sufficient uptake of CO₂ for photosynthesis and of minimizing water loss. Guard cells integrate internal signals and environmental stimuli to modulate stomatal aperture for plant survival under diverse conditions. Evidence suggests that modulation of transcription plays an important role in controlling guard cell activity, even though the details of this level of regulation remain mostly unknown. Recent work from different groups shows that two members of the R2-R3MYB transcription factors family of *Arabidopsis thaliana*, AtMYB60 and AtMYB61, are necessary for stomatal movements. Here we report the characterization of *AtMYB60* gene and of its promoter sequence. *AtMYB60* is specifically expressed in guard cell and its expression is negatively modulated during drought. A null mutation in *AtMYB60* results in the constitutive reduction of stomatal opening and in decreased wilting under water stress conditions. Transcript levels of a limited number of genes are altered in the mutant, many of which involved in the plant response to stress. We also report the deletion analysis of *AtMYB60* gene promoter through transgenic lines harbouring different portions fused to the *GUS* reporter gene. We identified the minimal promoter fragment necessary and sufficient for *AtMYB60* gene expression in guard cells and some putative regulators proteins binding to this portion. Our data indicate that AtMYB60 is a transcriptional modulator of physiological responses in guard cells and open new possibilities to engineering stomatal responses to improve plant survival during drought.