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# THE *ARABIDOPSIS THALIANA* TRANSCRIPTION FACTOR MYB59 REGULATES CALCIUM SIGNALLING DURING PLANT GROWTH AND STRESS RESPONSE

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The *Arabidopsis thaliana* transcription factor MYB59 is induced by cadmium (Cd) and plays a key role in the regulation of cell cycle progression and root elongation, but its mechanism of action is poorly understood. We investigated the expression of MYB59 and differences between wild-type plants, the myb59 mutant and MYB59-overexpressing lines during plant growth and in response to various forms of stress. We also compared the transcriptomes of wild-type and myb59 mutant plants to determine putative MYB59 targets. The myb59 mutant has longer roots, smaller leaves and smaller cells than wild-type plants and responds differently to stress in germination assay. Transcriptomic analysis revealed the upregulation of multiple genes involved in calcium (Ca) homeostasis and signalling in the myb59 mutant, including those encoding calmodulin-like proteins and Ca transporters. Notably, MYB59 was strongly induced by Ca deficiency, and the myb59 mutant was characterized by higher levels of cytosolic Ca in root cells and showed a modest alteration of Ca transient frequency in guard cells, associated with the absence of Ca-induced stomatal closure. These results indicate that MYB59 negatively regulates Ca homeostasis and signalling during Ca deficiency, thus controlling plant growth and stress responses.