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The role of AtRZF1-coupling protein 1 (AtRCP1) and its genetic interacting *Arabidopsis thaliana* RING zinc finger 1 (AtRZF1) during abiotic stress response in *Arabidopsis*

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The E3 ligase AtRZF1 is a component of drought-induced proline biosynthesis and drought sensitivity in *Arabidopsis*. In this study, we found that a novel AtRZF1-Coupling Protein 1 (AtRCP1) interacting with AtRZF1 by using Yeast two-hybrid and GST-pull down assays. Expression of AtRCP1 was strongly induced by Abscisic Acid (ABA), osmotic stress treatments. The green fluorescent protein-AtRCP1 fusion protein is localized in nucleus. Also, AtRCP1 has transcriptional activation activity and contains DNA binding domain indicating this functions as a transcription factor. The atrcp1 RNAi mutants were less sensitive to osmotic stress than the wild-type, whereas transgenic plants overexpressing AtRCP1 were hypersensitive during early seedling development, indicating AtRCP1 negatively regulates drought-mediated signaling. The expression levels of the stress markers or proline metabolism genes were altered both in AtRCP1 overexpressing and knockdown plants. Biochemical study through ubiquitin binding assay and ubiquitination assay implied that UBA domain in AtRCP1 is required for binding of Ub chains and increase of the amount of ubiquitinated AtRZF1. Moreover, genetic studies showed that the AtRZF1 gene could rescue the ABA- and osmotic-insensitive phenotype of atrcp1 RNAi mutant suggesting E3 ubiquitin ligase AtRZF1 is epistatic to AtRCP1 in osmotic stress signaling. Our findings provide new insight into the mechanism by which water deficit controls proline accumulation and drought response in *Arabidopsis*.

Biography

Ji-Hee Min is currently pursuing her PhD in Applied Biology at Chonnam National University, South Korea under the direction of Professor Cheol Soo Kim. She is interested in plant stress responses via ubiquitination system which determine protein stability or degradation. Her research was concentrated upon defining the role of interactor of E3 ubiquitin ligase *Arabidopsis thaliana* RING zinc finger 1 (AtRZF1) in the abiotic stress response.

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