

## **COP1 Controls Stress Responses by Regulation of the Level of E3 SUMO Ligase AtSIZ1**

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Ubiquitin and its cousin SUMO as small peptides regulate protein activities and stabilities by attachment to target substrates in yeast and animal. However, little is known about how they participate in cell signaling by modulating protein functions in plants. Here, we show that E3 SUMO ligase AtSIZ1 directly interacts with COP1 WD40 domain and is poly-ubiquitinated by COP1 *in vitro* and *in vivo*. In addition, AtSIZ1 level in *esd4* mutant is high compared to it in WT, and AtSIZ1 is accumulated as a mono- or di-sumoylated form in *esd4* mutant and *cop1-4* mutant, which indicate that AtSIZ1 might be stabilized by sumoylation and thereby protected from degradation by 26S proteasome complex. Moreover, levels of SUMO-conjugated proteins in dominant-negative COP1-overexpressing plants mutated in RING finger motif and *cop1-4* mutants are much higher than those in WT under stress conditions such as drought, cold and high salt. Thus, our results suggest that COP1 negatively controls SUMO-mediated plant development and stress responses by regulation of the level of AtSIZ1 through its E3 ubiquitin ligase activity.