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HOS12, a putative *Arabidopsis* homolog of yeast perinuclear *Mlp1* mediates stress-regulated gene expression and tolerance to freezing stress

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Objectives

We identified and characterizedone mutant, *hos12-1* (for high expression of osmotically responsive genes), which displays the super-induction of luminescence by low temperature and NaCl.

Materials and Methods

1. Material

Plant-*Arabidopsis thaliana* plants (ecotype C24) expressing *RD29A* promoter:luciferase (provided by Jian-Kang Zhu). Tagging vector-pSK1015 (provided by Prof. Detlef Weigel)

2. Methods

Arabidopsisplants were mutagenized with an *Agrobacterium tumefaciens*-mediated T-DNA transformation using the ctivation tagging vector pSK1015. Seeds from T2 plants which are resistance to bialaphos (30mg/L) were used for screening mutants sensitive to NaCl.

Results and Discussion

One of the mutants, *hos12-1*, showed highly enhanced induction of luciferace activity by cold or salt stress, but not by ABA treatment. The *hos12-1* mutation also enhanced other stress responsive genes such as *RD22, COR15A, KIN1* and *ADH* on cold or salt stress. The expression patterns of *CBF2* and *CBF3* were not changed by the *hos12-1* mutation. Interestingly, *hos12-1* plants were less tolerant to freezing or salt stress, despite of the enhanced induction of stress-responsive genes. The *HOS12* gene was identified by TAIL-PCR and *hos12*-1mutation was confirmed to be allelic with the corresponding insertion mutants obtained from SALK institute. *HOS12* gene encodes a protein homologous to yeast perinuclear proteins Mlp1p and Mlp2p. Like the yeast *mlp1/mlp2* mutant, the *hos12-1* plants were more sensitive to DNA double-strand breakage induced by bleomycin. We are now characterizing the function of *HOS12* gene in the plant stress responses. [Supported by EB-NCRC and Biogreen 21 program]

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