(05-1-29)

The *Arabidopsis* ENH3, enhancer of *sos3*, is required for plant salt tolerance.

Hyo-jung Lee, Dongwon Baek, Ji Yeon Kim, Wonkyun Choi, and Dae-Jin Yun*

Division of Applied Life Science, Graduate School of Gyeongsang National University, Jinju 660-701, Korea

Objectives

We screened enhancer mutants of *sos3-1* and isolated genes involved in NaCl sensitivity in *Arabidopsis*.

Materials and Methods

1. Material

Plant-*Arabidopsis thaliana* Col-gl1 *sos3-1* (provided by Prof. Jian-Kang Zhu)

Tagging vector-pSK1015 (provided by Prof. Detlef Weigel)

2. Methods

*Arabidopsisplant*s 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

A protein kinase complex consisting of the myristoylated calcium-binding protein SOS3 and the serine/threonine protein kinase SOS2 is activated by a salt-stress-elicited calcium signal. The protein kinase complex phosphorylates and activates various ion transporters, such as the plasma membrane Na+/H+antiporter SOS1. We screened enhancer mutants of sos3-1 that increase NaCl sensitivity from a T-DNA insertion population in *Arabidopsis* Col-gl1 *sos3-1* genetic background. Among the mutants we isolated, *enh3*, enhancer of *sos3*, exhibited greater root growth inhibition phenotype on the NaCl media. However, it wasnot sensitive to LiCl, KCl, and mannitol. Genetic analysis indicated it to be a single locus, recessive mutation. Analysis of the genomic fragment in the flanking region of T-DNA left border of *enh3* was isolated by TAIL-PCR. The protein of AtENH3 has two phosphorylation sites, two glycosylation sites and one ER signal peptide. Consistent with these observations, AtENH3 fusedwith sGFP was localized to ER. Expression of AtENH3 mRNA was induced by various stresses, such as NaCl, temperature, GA3 and cytokinine. Together, our results suggest that AtENH3 is required for NaCl tolerance in plant. [Supported by EB-NCRC and Biogreen 21 program]

* *Corresponding author* : Dae-Jin Yun, TEL: 055-751-6256, E-mail: djyun@gsnu.ac.kr