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atsmr17 modulates glucose responses through cysteine- and AMP-dependent manner in *Arabidopsis*

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Cysteine (Cys) and AMP are products of sulfate metabolism. Cys is an essential amino acid for protein and peptide synthesis or reduced sulfur donor for biosynthesis of methionine, coenzyme or cofactor, while AMP (Adenosine Monophosphate) is a monomer in the production of RNA and joins in many metabolism processes. However, whether theirs metabolism involved in abiotic stress adaptation in *Arabidopsis* remains largely unclear. Here, we identified *atsmr17 (Arabidopsis thaliana sulfate metabolism related 17),* a double mutant, that suppressed the insensitively of the parental line *atrzf1 (Arabidopsis thaliana ring zinc finger 1)* to glucose (Glc) treatment via reducing Cys and AMP accumulations. Under high Glc condition, the level of *atsmr17* was significant induced. Losing function of *atsmr17* leads to decrease the physiological phenotype including the germination rate, cotyledon greening, root and shoot differentiation. Interestingly, Glc response differently exhibited between root and shoot depend on *atsmr17* levels. Besides, qPCR analysis of the genes involved in primary sulfate pathway exhibited significantly lower in *atsmr17* leads to reduced 60% and 80% Cys contents compare to WT and *atrzf1*, respectively. Moreover, the *atsmr17*-overexpressing line displayed hyper-insensitive under high Glc concentration treatment manifested by the stress insensitive parameters and also by increased the proline, Cys, and AMP contents. Noticeably, apply exogenous Cys and AMP lead to rescue the phenotype of *atsmr17* under high Glc treatment. Taken together, our results indicate that *atSMR17* plays a role in high Glc response through modulating the sulfate metabolism in which related to Cys and AMP accumulations in *Arabidopsis.*

Biography

Van Tinh Nguyen is currently pursuing PhD in Department of Applied Biology of Chonnam National University, South Korea. His major is plant genomics functional researches which involved in abiotic stress.

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