

과제 일련번호: 2

ATAF2, a stress-responsive NAC transcriptional activator, directly regulates *NIT2* gene encoding a nitrilase catalyzing indole-3-acetic acid biosynthesis in *Arabidopsis*

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Using mRNA suppression subtractive hybridization method, we isolated a cDNA fragment showing sequence identity to *ATAF2*, a gene encoding a NAC domain transcription factor. Transient expression analysis using *ATAF2::GFP* fusion gene in *Arabidopsis* protoplasts indicated that ATAF2 protein was targeted to the nucleus. Using a microarray analysis, we found *NIT2* gene was repressed in *ataf2* knock-out plants comparing to wild-type. *NIT2* gene encodes a nitrilase which converts indole-3-acetonitrile (IAN) to indole-3-acetic acid. Expression of both *ATAF2* and *NIT2* genes was induced not only by osmotic stress but also by salicylic acid, nitric oxide-donor sodium nitroprusside, and IAN. Transgenic plants over-expressing *ATAF2* were highly sensitive to IAN, and showed an up-regulated *NIT2* expression. Furthermore, ATAF2 activated the promoter of *NIT2* gene in *Arabidopsis* protoplasts. From electrophoretic mobility shift assays, we also showed that a *NIT2* promoter region from positions -113 to -90 contained an ATAF2 binding site. These results suggest that ATAF2 might be involved in the modulation of auxin biosynthesis via transcriptional regulation of nitrilase under biotic and abiotic stress.

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