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Abiotic stress related genes confer tolerance to drought, salt, and low temperature in soybean

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GmNFYB and *miR1508a* were cloned and analyzed in transgenic soybeans under abiotic stress. In present study, the expression level of *GmNFYB* increased after treatments of ABA, NaCl, and PEG6000, which plays an important role in salt or drought stress responses. The *GmNFYB* transgenic plants appeared to grow better, with lower degree of leaf damage and higher RWC under the water-limited condition. The activity of SOD and proline was higher, while the concentration of MDA was lower.
The *GmNFYB* transgenic plants gained higher yield. Consequently, *GmNFYB* gene positively regulated drought stress resistance and modulated root growth in soybean.
MicroRNAs (miRNA) play crucial roles in many aspects of development and response to environment in plant. miR1508a is soybean-specific, and it's expression level was up-regulated by low temperature and ABA stresses in soybean. Five predicted target genes were down-regulated by *gma-miR1508a*, and 5'RACE experiments identified, which directly regulated by *gma-miR1508a*. *gma-miR1508a* inhibited genes by degrading mRNA of *Glyma13g01150* and *Glyma14g36930*, then partaken resistance of cold stress throw *CBF/DREB* and ABA-dependent pathway. Moreover, transgenic plants showed that *gma-miR1508a* could make plant delay germination, grown shorter and early flowering but enhancing cold tolerance in soybean.