

## Could an extra shot of TPS confer better tolerance to water deficit stress in *Medicago truncatula*?

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### Abstract

Drought is the major environmental constraint affecting plant growth and production yield, and considering the pronounced global environmental changes, water deficit will be evermore a challenge to be overcome. Consequently, it becomes urgent to develop crops showing a better tolerance to water deficit stress (WDS).

Studies from our group highlighted that the accumulation of trehalose-6-phosphate synthase (TPS) may improve plant tolerance to water stress. The goal of this study was to investigate the effect of the ectopic expression of the functional *A. thaliana* TPS in the response to water stress of the model legume *Medicago truncatula*. To accomplish that goal, we transformed M9-10a embryogenic line with the constitutive driven AtTPS cDNA using the *Agrobacterium*-mediated transformation and the resulting transgenic lines were characterized by measuring its expression by qRT-PCR. The results showed that we were able to obtain lines with different AtTPS expression, being grouped concerning their expression level: low, medium and high.

This gave us means to proceed with further studies about how different levels of the transgene can have an impact on the response of *M. truncatula* to WDS conditions. In this context, experiments are being performed to study the response of these different transgenic and wild type plants submitted to moderate and severe WDS and also to recovery from it. The physiological and molecular studies will help us to understand how the alteration of the trehalose metabolism can interfere with the response of plants to water deficit.