

The *MtWOX* and *MtCLE* genes in the regulation of *Medicago truncatula* somatic embryogenesis

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Plant somatic cells can be reprogrammed into totipotent embryonic cells that are able to form differentiated embryos in a process called somatic embryogenesis (SE). SE can occur naturally in various plant species and it is widely used for clonal propagation, transformation and regeneration of different crops. This process is regulated by hormone treatment and many proteins, among which WUSCHEL-related homeobox (WOX) transcription factors are believed to play crucial roles. The WOX family is involved in the regulation of a wide range of key developmental programs in different plant organs and tissues. CLE peptides are well-known hormonal regulators of plant development. *WOX* and *CLE* genes can be related to each other through feedback regulatory loops.

Our previous studies have shown that *MtWOX9-1* stimulates SE in *Medicago truncatula* [1] and overexpression of the *MtWOX9-1* gene increases the expression level of the *MtCLE08*, *MtCLE16*, *MtCLE18* genes in SE. In this study, we examine the overexpression effect of *MtCLE08*, *16*, and *18* on the expression level of *MtWOX9-1* gene and a number of other *MtWOX* genes, which were shown to change expression in SE according to the transcriptomic data. No significant impact of *MtCLE* overexpression on any *MtWOX* gene under study was found.

Our findings could be a helpful point for searching and studying new morphogenetic regulators controlling SE and could have a positive impact on plant biotechnology in improving the transformation and regeneration capacity for other legumes.

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REFERENCE

1. Tvorogova VE, Fedorova YA, Potsenkovskaya EA, et al. The WUSCHEL-Related Homeobox Transcription Factor *MtWOX9-1* Stimulates Somatic Embryogenesis in *Medicago truncatula*. *Plant Cell, Tissue and Organ Culture (PCTOC)*. 2019;138(3):517–527. DOI: 10.1007/s11240-019-01648-w

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