

## ***MtWOX2* gene in somatic embryogenesis of *Medicago truncatula***

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Somatic embryogenesis (SE) is one of the plant regeneration pathways. This process is very similar to zygotic embryogenesis, but embryos develop not from zygote, but from vegetative tissues. This process is widely used in biotechnology for plant transformation and propagation. Somatic embryos can derive directly from the vegetative tissues or through the formation of callus. The search for SE stimulators is very important for plant biotechnology.

Several genes were reported to be the regulators of this process, among them the *WOX* (*WUSCHEL-RELATED HOMEODOMAIN*) family members are presented. These genes encode homeodomain-containing transcription factors, participating in different developmental processes. *WOX2* is known for its participation in zygotic embryogenesis. It is expressed in the zygote and later in the apical domain of the embryo. We study the role of this gene in the somatic embryogenesis. Overexpression of *MtWOX2* in some cases leads to the development of embryogenic calli with increased size. We performed transcriptome analysis of *Medicago truncatula* calli with overexpression of this gene compared to the calli overexpressing *GUS*.

It was shown that *MtWOX2* overexpression led to the changes in expression levels of genes, enriched with several GO pathways, including groups related to oxidative stress and ROS formation, response to toxic substance and auxin-activated signaling pathway. Among differentially expressed genes there are members of several TF families, e.g. MADS-box, BHLH, MYB, bZIP and others. These genes may regulate embryogenic callus development. Together, these results can be used for the search of new morphogenic regulators applicable for plant transformation.

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