

Characterization of Ethanol Inducible Gene Expression System in Transgenic Sugar Beet Calli Derived From Stomatal Guard Cells

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Abstract

Controlled gene expression of transgenic plants is one of the main aim of genetic manipulations. This control can be done in transcriptional level. Ethanol inducible promoter system is suitable for external regulation of gene expression. In this study, *GUS* gene expression under the control of ethanol inducible promoter was evaluated in calli derived from sugar beet stomatal guard cell protoplasts. Protoplasts of stomatal guard cells from sugar beet leaves were isolated and calli derived from these protoplasts, were infected with *Agrobacterium* harboring *GUS* gene under the control of ethanol inducible promoter. Transformed calli were treated with ethanol and histochemical GUS assay carried out before and after treatment of calli with ethanol. Some transformed calli showed high level expression of *GUS* gene after treatment with ethanol. These calli didn't show any *GUS* gene expression before applying ethanol. The level of GUS expression after ethanol induction was comparable to constitutive *GUS* gene expression mediated by CaMV 35S promoter. Furthermore high level GUS expression in these calli demonstrated the activity of this system in sugar beet.

Keywords: Sugar beet, Gene transformation, Ethanol- inducible promoter, Protoplast, Stomatal guard cells, *GUS* reporter gene

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