CHARACTERIZATION OF INDUCIBLE AND ROOT-SPECIFIC PROMOTERS FROM SOYBEAN

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Promoters play a central role in the regulation of gene expression, determining when, where and to what extent a gene is expressed. Transgenic plants with a strong constitutive expression of functional genes and/or transcription factors often suffer from undesirable phenotypes. The use of differentially regulated promoters is drawing increasing attention from research groups interested in controlling transgene expression in response to environmental stimuli, wounding or in specific tissues. The aim of this study is to isolate and characterize putative root-specific and drought-inducible promoters from soybean [*Glycine max* (L.) Merr.]. Four genes expressed predominantly in roots and five genes induced by drought-stress were identified. The expression profile of the five genes related to drought stress was analyzed in a highly sensitive and a slightly sensitive soybean cultivar submitted to dehydration stress. The coding sequences of the putative root-specific and inducible genes were aligned to the soybean genome and about 1000 to 2000 bp upstream of the start codon were used for primers design. *In silico* analysis showed that *cis*-elements related to root-specific expression and involved in different stress responses were identified in the putative root-specific and drought-induced studied promoters, respectively. To analyze their activities, the promoters were subcloned into pCAMBIA1300 vectors upstream of the GUS reporter gene. *Agrobacterium rhizogenes* containing the recombinant plasmids were used to induce transformed hairy roots in soybean. Preliminary results have shown that three root-specific promoters directed GUS expression in stably-transformed soybean hairy roots. Tobacco and soybean transformation experiments are being carried out in order to confirm the predominant root gene expression in complete transgenic plants. Our expectation is that, in the future, these promoters could be used for soybean genetic engineering.

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