STRATEGIES FOR THE EXPRESSION IN TOBACCO OF THE PROTEIN TYROSINE PHOSPHATASE 7 GENE FROM THE POLYDNAVIRUSES OF THE PARASITOID TOXONEURON NIGRICEPS

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The PTP7 gene from the polyDNAvirus of the parasitoid Toxoneuron nigriceps (Hymenoptera, Braconidae) codes for a Protein Tyrosine Phosphatase. The PTP7 protein is probably involved in the underphosphorylation of regulatory proteins of the prothoracicotropic hormone signal transduction pathway, which culminates with a translational block of protein synthesis in the parasitized H. virescens larvae (Falabella et al. 2006). The PTP7 displays an high similarity to well characterised protein tyrosine phosphatases of the Meg2 subtype, which can negatively or positively regulate diverse signalling pathways in eukaryotes. Here we report on the expression of the PTP7 gene in tobacco aimed to evaluate its potential utility for crop protection and investigate a possible role in planta. To this aim, we constructed a chimaeric gene encoding a fusion protein, in which the PTP7 is fused to SP1 signal peptide of the tobacco Pathogenesis-Related protein-1. Furthermore, an ER-retention signal peptide was added at the C-terminus. These signal peptides should ensure an efficient translation of this viral gene in tobacco while minimising the risk of putative detrimental effect. Stable genetic transformation of tobacco originated putative transgenic plants without obvious phenotypic abnormalities. Out of 67 plantlets, 56 regenerants were PCR positive. These plants were screened by RT-PCR to verify the transcription of the PTP7 gene and by Western to verify the expression of this protein in plant cells. Only 7 plants transcribed the transgene and accumulated the PTP7 protein in very low quantity. Concurrently, the PTP7 gene was cloned in a binary vector of a new chemically-inducible transgene expression system based on the used pOp/LhG4 transcription activation system and stable transformation of tobacco is presently in progress.