

Expression Patterns of the Mitochondrial Uncoupling Protein Isoforms from *Arabidopsis thaliana*

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Uncoupling proteins (UCP) belong to the mitochondrial anion carrier family and uncouple respiration from ATP synthesis. Several evidences suggest that in plants, UCPs play a role as an early antioxidant defense system in response to environmental stresses. In this study, the expression profiles of six genes that encode pUCPs in *Arabidopsis thaliana* (*AtUCP1-6*) in response to treatments leading to salt (NaCl) and osmotic (mannitol) stress, and to the plant hormone abscisic acid (ABA), were investigated. These stresses impair mitochondrial function and induce oxidative stress in plant cells. Globally, all genes were expressed at very low levels. Moreover, no significant change in the expression profile of such genes in response to the applied treatments was observed, with the exception of *AtUCP1* (induced by mannitol) and *AtUCP5* (induced by mannitol and repressed by ABA). In search for a better understanding of the transcriptional activation of these genes, the promoter sequences of *AtUCP1* and *AtUCP2*, respectively, were transcriptionally fused to the *uidA* reporter gene (GUS) and stably transformed into tobacco plants (generating lines AtP1 and AtP2). Histochemical analysis showed that in AtP1 plants, GUS activity was detected in all organ/tissues examined. In AtP2 plants, however, GUS staining was observed only in roots. These tobacco lines were subjected to treatment with ABA, mannitol and cold for further analysis of GUS expression.

Key words: Uncoupling proteins, mitochondria, quantitative gene expression, transgenic