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Biochemical characterization of an Arabidopsis jasmonic acid glucosyltransferase

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Objectives

We have tried to isolate a Arabidopsis *UDP-glucose:jasmonic acid glucosyltransferase* (*AtJGT*) gene to understand the role of jasmonic acid-glucose in plant.

Materials and Methods

1. Material:

Plant - *Arabidopsis thaliana* (Col.)

E. coli- *Escherichia coli* BL21 (DE3) pLysS

2. Methods:

The recombinant genes out of the Arabidopsis glucosyltransferase multigene family were overexpressed in *E. coli* and their products were purified with glutathione-agarose beads.

Results and Discussion

Biochemical characterization of recombinant gene products out of the Arabidopsis glucosyltransferase multigene family has identified one enzyme with high activity toward the plant cellular regulator jasmonic acid (JA). The protein AtJGT1 (UDP-glucose:JA glucosyltransferase) had also significant activities with other substrates such as dihydrojasmonic acid, indole-3-acetic acid (IAA), indole-3-propionic acid and indole-3-butyric acid. The K_m values of AtJGT1 for JA or IAA were similar to those of an Arabidopsis IAA glucosyltransferase UGT84B1 from the previously published report. Northern blot analysis showed that *AtJGT1* was highly expressed in leaves, but little detectable in other tissues including root, stem and inflorescence. This study describes the first biochemical analysis of a recombinant glucosyltransferase with JA activity and provides the foundation for future genetic approaches to understand the role of JA-glucose in Arabidopsis.

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