E239 **Activation of Figleaf Root Plasma Membrane H^+-ATPase Is Not Induced by Enhanced Gene Expression, But by the Enzyme Conformational Changes**

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The plasma membrane (PM) H^+-ATPase has been proposed to play important transport and regulatory roles in plant physiology. Enzyme activity is controlled by an autoinhibitory C-terminal regulatory domain. The H^+-ATPase is activated by trypsin digestion of C-terminal or fusicoccin/14-3-3 protein complex binding to this part. Also, lysophosphatidylcholine (lysoPC) activates the H^+-ATPase by a mechanism involving the C-terminal part of the protein, but not the autoinhibitory domain. We examine whether activation of the H^+-ATPase (FHA) of a figleaf root PM by conditioning at low temperature is resulted from the increased gene expression or from the conformational changes of the enzyme. RNA gel blot analysis and western blot analysis using an *Arabidopsis* H^+-ATPase antibody indicated that FHA expression was not changed by cold treatment, but fatty acid desaturase (*fad3*) gene expression was increased. While the enzyme activity of control roots was increased by trypsin or lysoPC treatment, that of cold conditioned roots was not changed any further. Taken together, our data suggest that activation of figleaf root PM H^+-ATPase may conform to the C-terminal modulation that lysoPC or fusicoccin displays.

E240 Structure and Expression Pattern of a cDNA Clone Encoding Glutamine Synthetase from Root Nodule of *Elaeagnus umbellata*

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We have isolated a cytosolic glutamine synthetase (GS1) cDNA clone by screening cDNA library constructed from mRNA of the root nodule of *Elaeagnus umbellata*. The nucleotide and amino acid sequences of the GS1 showed the highest homology with that of *Lotus japonicus*. Southern-blot analysis of genomic DNA revealed the presence of at least two GS genes on the genome of *E. umbellata*. Northern analysis of GS1 expression was performed on RNAs extracted from different tissues and nodules on various developmental stages. GS1 expression was similar in the leaf, root, and root nodule but, a little bit enhanced in the root nodule. Also its expression increased with nodule development with the highest level at 6 and 8 weeks after inoculation and decreased thereafter. *In situ* hybridization result showed that in the root nodule GS1 transcript was detected at the fixation zone of infected cells, meristem and vascular bundles.