E223 Acetate-mediated change of proton gradient across plasma membrane is responsible for inhibition of glucose uptake and preferential use of acetate during acetate/glucose diauxic growth.

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We recently reported that suspension-cultured rice cells grown on mixed carbon sources of Glc and acetate exhibited diauxic growth in which Glc was used only after acetate was consumed (Lee and Lee, 1996). Carrot (*Daucus carota* L.) suspension cells, showing a very similar diauxic growth on Glc and acetate, were used to delineate mechanisms underlying diauxic growth. It was shown that acetate transported protons in medium into cells, altering proton gradient across plasma membrane. It was also strongly suggested that Glc was cotransported with proton, as known in many other systems in plants, and its uptake was hampered by alkalization of medium. It thus appears conclusive that acetate-mediated alkalization of growth medium and simultaneous acidification of cytosol is responsible for inhibition of Glc uptake and subsequent Glc utilization during the first growth phase at which only acetate is utilized. Indistinguishable uptake rates of Glc and 3-0-methylglucose (OMG), a non-metabolizable Glc analogue, in the presence of acetate strongly suggested that acetate-mediated catabolite repression of the Glc-utilizing enzymes was not a contributor to the observed diauxic growth. It was also demonstrated that Glc was used earlier than another weak acid malate in Glc/malate diauxie growth, and that malate, unlike acetate, was not able to alter proton gradient. These results strongly suggest that Glc utilization of plant cells can be affected by copresenting carbon source which can alter proton gradient across plasma membrane.

E224 cDNA cloning and characterization of ornithine transcarbamylase (*argF*) from *Canavalia lineata*

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Ornithine transcarbamylase (OTC) catalyzes the first reaction of biosynthetic pathway of arginine in plants. In *Canavalia lineata*, the OTC participates not only in the biosynthesis of arginine, but also in that of canavanine. In order to understand the function and regulation mechanism of OTC in canavanine synthesis, we undertook cloning of OTC cDNA from *C. lineata*. We used immunoscreening method to isolate a 1.4 kb *C. lineata* leaf cDNA encoding OTC. The cDNA contains a single major ORF of 369 amino acids whose deduced sequence exhibits a high degree of homology with other OTCs. The predicted molecular mass of this protein is 40,622 Da. *In vivo*, OTC occurs as a trimer of identical 36 kDa polypeptides, suggesting that this enzyme is snythesized as a cytosolic precursor protein. "This research was supported by KOSEF through SRC for Cell Differentiation(96-5-1)"