

**E229** Wall-localized cellulase from maize coleoptiles

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Wall-localized cellulase was partially purified from freeze-dried maize coleoptiles by a combination of DEAE-Sepharose, Superdex-200 gel filtration and Hydroxyapatite column chromatography. Activity was measured by both reducing sugar assay and dot assay on agarose gel containing carboxymethylcellulose(CMC). *In situ* activity staining on a nondenaturing gel overlaid on agarose gel containing CMC turned out to be a quite reliable method to detect cellulase activity. The molecular weight of partially purified cellulase was determined to be about 53 kD based on SDS-PAGE. The enzyme catalyzed CMC with an optimal pH of 4.5 and optimal temperature at 40°C. It also catalyzed CMC with a  $K_m$  of 2.02 mg/ml, and a  $V_{max}$  of 160 ug/hr/ml. The 1,4- $\beta$ -glucosyl linkages of CMC, fibrous cellulose and lichenan were cleaved specifically by this enzyme. The reducing reagents strongly enhanced the activity, suggesting that SH-groups of the enzyme were protected from oxidation. These results will be valuable to understand the structure of wall-localized cellulase in maize coleoptiles and to predict its possible function in the cell wall. Supported by a grant from KOSEF 951-0504-013-2.

**E230** Adaptive Recovery of Gravitropic Response Inhibited by NPA in Maize (*Zea mays* L.) Roots

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We have investigated the effect of NPA on gravitropism of maize root. The inhibitory effect of gravicurvature prevented by NPA was recovered on critical concentration of NPA after 4-5 h. Gravicurvature was inhibited about 60% after 2 h application of  $3 \times 10^{-7}$  M of NPA on both side of root elongation zone but the degree of curvature was recovered to the control level after 5 h even though NPA was continuously applied until this time. Asymmetric movement of lateral from  $^{45}\text{Ca}^{2+}$  across the elongation zone of gravistimulated maize roots were reduced by NPA at first 2 h of transport period but the movement also recovered to the control level after 5 h. This is corresponded with the result that the inhibitory effect by NPA was recovered. Gravicurvature of maize root pretreated with  $10^{-5}$  M staurosporine or  $10^{-5}$  M okadaic acid was not recovered in case of applying of agar with  $3 \times 10^{-7}$  M NPA. This results may suggest that protein phosphorylation and dephosphorylation process are also involved in gravitropic recovering responses.