

제목 : Inactivation of Brain Succinic Semialdehyde Reductase by o-Phthalaldehyde

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Succinic semialdehyde reductase, one of key enzyme of GABA shunt in CNS, is inactivated by o-phthalaldehyde. The inactivation followed pseudo first-order kinetics, and the second-order rate constant for the inactivation process was $28 \text{ M}^{-1}\text{s}^{-1}$ at pH 7.4 and 25°C.

The absorption spectrum($\lambda_{\text{max}}=377 \text{ nm}$), fluorescence excitation($\lambda_{\text{max}}=340 \text{ nm}$) and fluorescence emission spectra ($\lambda_{\text{max}}=409 \text{ nm}$) were consistent with the formation of an isoindole derivative in the catalytic site between a cysteine and a lysine residues about 3Å apart.

The substrate, succinic semialdehyde, did not protect the enzymatic activity against inactivation, whereas the coenzyme, NADPH, protected against o-phthalaldehyde induced inactivation of the enzyme. About 1 isoindole group per mol of the enzyme was formed following complete loss of the enzymatic activity.

These results suggest that the amino acid residues of the enzyme participating in reaction with o-phthalaldehyde more likely residues at or near the coenzyme binding site.