Sigmal transuction in a protozoa, *Euglena gracilis*, under salt stress.

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Euglena gracilis Z is a protozoa, living in fresh water. When *Euglena* are transferred to stressed conditions, for example, salt or heat stress, *Euglena* synthesize and accumulate trehalose as a compatible solute to adapt environmental changes. Although the regulation of this pehnomenon is not well known, we have reported that fructose-2,6-bisphosphate (Fru-2,6-P_2), which is known as a regulator of sugar to metabolism in mammalians, is a key regulator in trehalose synthesis under salt stress in this organism. Here, we report that the signal transduction involved in the trehalose synthesis of *Euglena* under salt stress.

E. gracilis treated with protein kinase inhibitors, staurosporine, calphostin C, 2,5-Mec and harbimycin, were transferred to a medium containing salt and then the trehalose content in the cell was measured. Trehalose accumulation was markedly inhibited in the cells treated with staurosporine, 2,5-Mec and harbimycin. The Fru-2,6-P_2 content in the cells not treated with them in the salt stressed conditions decreased rapidly, while the content of Fru－2,6－P2 in the cells treated with the protein kinase inhibitors decreased gradually. Furthermore, decrease of F-6-P 2-kinase activity under the salt stress was moderated in the cells treated with the protein kinase inhibitors. We also found that cyclic AMP dependent protein kinase catalytic subunit suppressed F-6-P 2-kinase activity *in* vitro. These results showed that the protein kinase cascade is involved in the signal transduction regarding the trehalsoe accumulation of *E. gracilis* under salt stress and that phosphorylation of serine/threonine residue regulate the F-6-P 2-kinase activity directly.

We detected tyrosine phosphorylated peptide by immunoblot technique with an anti-phosphotyrosine antibody. Several peptides were found in the extract of *E. gracilis* under salt stress and the N-terminal amino acid sequence of one of the protein was determined.