Genetics, Seoul National University

8-Cl-cAMP has been known to induce growth inhibition and differentiation in a variety of cancer. To further understand the mechanisms of anticancer activity of 8-Cl-cAMP, we tried to find the genes whose expressions are influenced by 8-Cl-cAMP treatment. DT cells were treated with 8-Cl-cAMP for 72 h and then the RNA expression levels were compared with those of control cells through DD-PCR. By analyzing the expression patterns, we were able to select several genes whose expressions are increased or decreased after 8-Cl-cAMP treatment. Among these genes, we chose CD98 heavy chain for further analysis. CD98 is a type II integral membrane protein consisting of an 80 kDa heavy chain and a 40 kDa light chain. CD98 is strongly expressed on the surface of activated lymphocytes and various tumor cells. The expression of CD98 heavy chain is augmented up to 3 folds after 72 h-treatment of 8-Cl-cAMP, which was reversed to the basal level by PKC inhibition but was not affected by PKA or MAPK inhibition. Furthermore, a potent PKC activator PMA alone could increase CD98 heavy chain expression. The present results suggest that 8-Cl-cAMP increases CD98 heavy chain expression via PKC pathway.

E143 Lipid Transfer Particle Mediates the Delivery of Diacylglycerol from Lipophorin to Fat Body in Larval Manduca sexta

Hwa Kyung Yun*, Lilian E. Canavoso[1], Zeina E. Jouni[2] and Michael A. Wells[2]
Department of Biology, Hanseo University; [1]Biochemistry Department, Universidad Nacional Cordoba; [2]Department of Biochemistry and Molecular Biophysics, The University of Arizona

This work analyzed the process of lipid storage in fat body of larval *Manduca sexta*, focusing in the role of lipid transfer particle(LTP). The transfer of DAG from Lp to fat body and its storage as TAG was significantly inhibited(60%) by preincubation of the tissue with anti-LTP antibody. Lipid transfer was restored to control values by the addition of purified LTP to fat body that had been treated with anti-LTP antibody. Incubation of fat body with dual labeled-DAG-Lp or the tissue treatment with ammonium chloride showed that neither a membrane-bound lipoprotein lipase nor Lp endocytosis are relevant pathways to tranfer or to storage lipids into fat body, respectively. The treatment of fat body with lipase after its incubation with [^{3}H]-DAG-Lp significantly reduces the amount of labeled-DAG associated with the tissue, suggesting the lipid is still on the external surface of the membrane. These results indicate that the main pathway for the transfer DAG from Lp to fat body is via a LTP-mediated process.

E144 Effects of ATP on the stability of liver and pectoral muscle enzymes in 6-aminonicotinamide treated quail against heat and trypsin digestion

Sung Joon Ahn, and In Kook Park*
동국대학교 생물학과

The stabilities of liver and pectoral muscle enzymes in 6-aminonicotinamide (6-AN) treated quail against heat and trypsin treatment in the presence and absence of ATP were investigated. In the thermal stability of liver enzymes, ATP provided a high level of protection for glyceraldehydes-3-phosphate dehydrogenase over the incubation temperature but virtually exerted no effects for lactate dehydrogenase and acetylcholinesterase. Similar observations were also made with the pectoral muscle but the degree of protection was greater. In the susceptibility towards trypsin digestion there was a substantial protection against trypsin digestion by ATP of liver glyceraldehydes-3-phosphate dehydrogenase and lactate dehydrogenase but almost no protection of acetylcholinesterase. In the

muscle, however, glyceraldehydes-3-phosphate dehydrogenase, lactate dehydrogenase and acetylcholinesterase all were substantially protected to a similar degree. Both in heat and trypsin treatment the stability of pectoral muscle enzymes appeared to be more substantially protected by ATP compared to liver enzymes among which glyceraldehydes-3-phosphate dehydrogenase revealed the greatest protection. Overall results suggest that the effect of 6-aminonicotinamide treatment on the stability of enzymes in liver and muscle appears to be specifically and selectively affected by exogenous ATP.

E145 Identification of Calcium Channel Subtypes in Human Spermatozoa

Jin-Yong Park*[1], Hyun-Jong Ahn[2], Eun-Jung Lee[1], Jung-Gue Ku[1] and Jung-Ha Lee[1]

[1]Department of Life Science, Sogang University, Seoul 121-742, Korea; [2]Depart of Microbiology, Kyung Hee University Medical School

The acrosome reaction is a calcium-required exocytotic event for which external calcium entry through voltage-activated calcium channels have been known to be critically involved in mammalian sperm. Here we identified calcium channel subtypes expressing in human spermatozoa. T-type and non-L-type channel messages were detected by RT-PCR using degenerate primers, while L-type channel messages were rarely detected. Sequencing of the PCR products displayed 1B, 1E, 1G, 1H, and 1C sequences. RT-PCR using specific primers showed the similar results as those detected by the degenerate primers. These results indicated that human spermatozoa express multiple subtypes of voltage-activated calcium channels. Taken together, we propose that T-type and non-L-type channels expressing in human sperm might be main gates for external calcium entry, evoking the acrosome reaction. Relative expression levels of 1B, 1E, 1G, 1H, and 1C mRNA messages in human sperm will be evaluated by RNase protection assays.

E201 Salicylic acid and Paraquat Tolerance in Arabidopsis thaliana Plants

Hyesook Kim*, Hyun-Ki Chun and Chang-Duck Jin

Division of Life Sciences, Kangwon National University

This study was aimed to investigate the physiological role of salicylic acid(SA), with special regard to the interaction among SA, H_2O_2 levels and antioxidant enzymes, in the protection from paraquat(PQ)-induced oxidative damages in *Arabidopsis thaliana* leaves. Foliar spraying of *A. thaliana* plants with 1.0 mM SA solution significantly improved their tolerance to a subsequent PQ-induced oxidative stress. This observation was confirmed by reduction of leaf injuries such as the decrease of leaf fresh weight and the loss of chlorophyll and proein. The analysis of antioxidant enzymes showed that whereas SA pretreatment effectively retarded the rapid decrease of superoxide dismutase(SOD), catalase and ascorbate peroxidase activities due to 10 M PQ treatment, there was an increase in guaiacol peroxidase activity. However, we also found that 12 h pretreatment of plants with SA alone caused a mild leaf injury symptoms along with a small increase of H_2O_2 content. This enhanced H_2O_2 levels occurred in parallel with the inrease of SOD and the catalase inhibition. From our results it can be assumed that due to an increase of SOD and a catalase inhibition by SA pretreatment, a moderate increase in H_2O_2 levels may occur, which can cause a developmental change of antioxidant enzymes leading to enhanced PQ tolerance in *A. thaliana* plants.