on the pathogenesis of MeHg-induced central neuropathy, no useful mechanism of toxicity has been established so far. In this study, two methods, cDNA Microarray and SSH, were performed to assess the expression profile against MeHg and to identify differentially expressed genes by MeHg in neuroblastoma cell line. TwinChip Human-8K (Digital Genomics) was used with total RNA from SH-SY5Y (human neuroblastoma cell line) treated with solvent (DMSO) and 6.25 uM (IC_{50}) MeHg. And we performed forward and reverse SSH method on mRNA derived from SH-SY5Y treated with DMSO and MeHg (6.25 uM). Differentially expressed cDNA clones were sequenced and were screened by dot blot and ribonuclease protection assay to confirm that individual clones indeed represent differentially expressed genes. These sequences were identified by BLAST homology search to known genes or expressed sequence tags (ESTs). Analysis of these sequences may provide an insight into the biological effects of MeHg in the pathogenesis of neurodegenerative disease and a possibility to develop more efficient and exact monitoring system of heavy metals as common environmental pollutants.

Poster Presentations - Field B1. Physiology

[PB1-1] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Effects of protein kinase inhibitors on mellitin-induced histamine release in RBL 2H3 mast cells

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It has been previously reported that silica dose-dependently caused the increase of histamine release and arachidonic acid release in RBL 2H3 cells. In this study, to investigate role of arachidonic acid in inflammatory response including histamine release and reactive oxygen species (ROS) generation, we observed effects of mellitin on histamine release and ROS generation in RBL 2H3 cells. Mellitin, an endogenous phospholipase A2 activator, dose-dependently increased both histamine release and arachidonic acid release, whereas decreased the generation of ROS and peroxynitrite. Mellitin-induced histamine release was significantly inhibited by MAFP (cPLA2 inhibitor, 10 μM) and bromoenol lactone (iPLA2 inhibitor, 10 μM), but not by OPC and mepacrine (secretory PLA2 inhibitor). Arachidonic acid release induced by mellitin was augmented by histamine receptor antagonists (pyrilamine and cimetidine), which indicate that histamine may be involved in arachidonic acid release via negative feedback machanism. On the other hand, mellitin-induced histamine release was significantly inhibited by DHC (tyrosine kinase inhibitor, 10 μM) and worthmannin (phosphatidylinositol 3-kinase inhibitor, 10 μM), and mellitin-induced arachidonic acid release was significantly inhibited by bisindolmaleimide (protein kinase C inhibitor, 10 μM) and worthmannin (10 μM). These results indicate that phosphatidylinositol 3-kinase plays an important role in both arachidonic acid release and histamine release induced by mellitin in RBL 2H3 mast cells.

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[PB1-2] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Sodium Chloride Regulation of COX-2 gene expression is independent of aldosterone activated mineralocorticoid receptor

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Production of prostaglandins involved in renal salt and water homeostasis is modulated by regulated expression of the inducible form of cyclooxygenase-2 (COX-2) at restricted sites in the rat kidney. COX-2 expression in the kidney is regulated by dietary salt intake, but the mechanism of its action is not fully understood. We have previously that high salt regulates COX-2 expression in rat kidney. The aim of the present study was to examine the role of mineralocorticoid receptor (MR) in regulation of COX-2 in kidney cell line (COS). In COS cells, TPA and hypertonicity induced a marked increase in COX-2 promoter activity. Spironolactone antagonized the aldosterone-induced trans-activation activity of the rMR transiently expressed in COS cells lacking steroid receptors. But stimulation of COX-2 promoter activity by hypertonicity was not reduced by inhibition of MR (spironolactone, 100 nM) in COS cells transiently transfected with COX-2 and rMR. We conclude that COX-2 is regulated by hypertonicity and this regulation is not occurred through MR. Currently, we are searching for regulatory region responsible for salt-induced COX-2 gene expression using several luciferase constructs containing COX-2 promoter. This work was supported in part by grants from the Korean Ministry of Health and Welfare (01-PJ1-Pg1-01CH06-0003; YJL).

[PB1-3] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Anti-inflammatory activity of organic germanium

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Germanium is present in all living plant and animal matter in micro-trace quantities. Clinical trials and use in private practices for more than a decade have demonstrated germanium's efficacy in treating a wide range of serious afflications, including cancer, arthritis and senile osteoporosis. To investigate anti-inflammatory activity of organic germanium, we measured the effect of organic germanium on histamine release, ROS generation, arachidonic acid release in RBL 2H3 cells, and caragennin-induced paw edema in rats. Organic germanium inhibited caragennin-induced paw edema in a dose-dependent manner, suggesting that organic germanium has anti-inflammatory activity. Although organic germanium alone slightly increased ROS and peroxynitirte generation in RBL 2H3 cells, it dose-dependently inhibited mellitin-induced arachidonic acid release in RBL 2H3 mast cells. These results suggest that anti-inflammatory effect of organic germanium may be due to the inhibition of phospholipase A2 activity and organic germanium may be used as anti-inflammatory agent.

[PB1-4] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Effects of aloesin on physiological changes in rats after multiple oral administration

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This study was conducted to examine the effect of subchronic oral administration of aloesin on