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Objective and Design: The underlying mechanism of HCl in oesophagitis caused by the reflux of gastric juice, especially HCl, remains unclear. To investigate the underlying mechanism of HCl in oesophagitis, we observed the inflammatory responses to HCl in RBL-2H3 mast cells.
Materials and Methods: The rat basophilic leukemia (RBL-2H3) cells were used for measurements of histamine release, arachidonic acid (AA) release and reactive oxygen species (ROS) and peroxynitrite generation induced by HCl.
Results: Exogenous HCl dose-dependently increased the histamine release and ROS generation, whereas it decreased spontaneous release of [3H] AA and spontaneous production of peroxynitrite. Mepacrine (10 μM), oleyloxyethyl phosphorylcholine (10 μM) and bromoenol lactone (10 μM) did not affect both histamine release and ROS generation induced by HCl. U73122 (1 μM), a specific phospholipase C (PLC) inhibitor did not have any influence on histamine release and ROS generation. Propranolol (200 μM), a phospholipase D (PLD) inhibitor, and neomycin (1 mM), an nonspecific PLC and PLD inhibitor, significantly inhibited both histamine release and ROS generation. Diphenyleneiodonium (10 μM), an NADPH oxidase inhibitor, and tiron (5 mM), an intracellular ROS scavenger significantly inhibited HCl-induced histamine release and ROS generation.
Conclusion: These findings suggest that inflammatory responses to HCl is related to histamine release and ROS generation, and that ROS generation by HCl may be involved in histamine release via PLD pathway in RBL-2H3 cells.

Poster Presentations - Field B3. Neuroscience

[PB3-1] [10/18/2001 (Thr) 14:00 - 17:00 / Hall D]

Effects of tributyltin compounds on catecholamine biosynthesis in PC12 cells.

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The effects of tributyltin (TBT) compounds on dopamine biosynthesis in PC12 cells were investigated. Treatments of PC12 cells with tributyltin acetate (TBTA) and tributyltin chloride (TBTC) showed 42.8% and 44.9% inhibition of dopamine content at a concentration of 0.1 μM and 0.5 μM for 48h. IC50 values of TBTA and TBTC were 0.12 μM and 0.6 μM, respectively. Next, the intracellular mechanisms of TBT compounds were examined. Dopamine content decreased at 6h and reached a minimal level at 24h after the exposure to 0.1 μM TBTA and 0.5 μM TBTC. The decreased dopamine level was maintained for up to 48h. TH activity was inhibited at 6h following the treatment with TBT compounds and was maintained at a reduced level for up to 36h (20-40% inhibition at 0.1 μM of TBTA and 0.5 μM of TBTC). TH mRNA level also started to decrease at about 6h and reached a minimal level at 24h after exposure of PC12 cells to TBT compounds. These results suggest that TBT compounds contribute to the decrease in dopamine content by the inhibition of TH activity and the regulation of TH gene expression in PC12 cells.
* This work was supported by the Brain Korea 21 project.

[PB3-2] [10/18/2001 (Thr) 14:00 - 17:00 / Hall D]

Effects of tributyltin compounds on L-DOPA-induced neurotoxicity in PC12 cells.

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There is little information concerning the effects of tributyltin (TBT) compounds, which are the endocrine disrupters on living organisms. TBT compounds and L-DOPA both induce apoptosis in catecholaminergic PC12 cells. In this study, the effects of TBT compounds on L-DOPA-induced neurotoxicity were investigated. Tributyltin acetate (TBTA) and tributyltin chloride (TBTC) at concentration ranges of 0.05-0.75 μM decreased dopamine content in a concentration-dependent manner in PC12 cells. TBTA (0.1 μM) and TBTC (0.5 μM) showed 42.8% and 44.9% inhibition of dopamine content. Exposure of PC12 cells to 0.1 μM TBTA, 0.5 μM TBTC or 20 and 50 μM L-DOPA neither affected cell viability, determined by MTT assay, nor induced apoptosis, tested by TUNEL technique and flow cytometry. However, at concentrations higher than 0.5 μM TBTA and 1.5 μM TBTC caused a neurotoxicity through an apoptotic process. In addition, TBTA at 0.1 μM and TBTC at 0.5μM also enhanced L-DOPA-induced neurotoxicity (L-DOPA concentration, 50 μM). These results suggest that TBT compounds stimulate L-DOPA-induced neurotoxicity in PC12 cells.
* This work was supported by the Brain Korea 21 project.

[PB3-3] [10/18/2001 (Thr) 14:00 - 17:00 / Hall D]

Mechanosensitive Ion Channels in Sensory Neurons

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Mechanosensitive (MS) ion channels are present in a variety of cells. However, very little is known about the ion channels that are responsible for mechanical sensitivity in sensory neurons. In this study, we have identified two distinct types of MS channels in membrane patches of cultured sensory (DRG) neurons of the neonatal rat. The two most frequently encountered MS channels were identified in 2125 membrane patches tested: one activated at low pressure (threshold: ?0 ~ ?0 mmHg, low-threshold (LT)), another channel activated only at high negative pressure (threshold: ?0 mmHg, high-threshold (HT)). In symmetrical 140 mM Na+ solution in inside-out patches, single-channel conductances of LT and HT MS channels were obtained. The current-voltage relationships of the LT and HT MS channels were outwardly-rectifying and linear, respectively. Both of the two channels were permeable to monovalent cations and Ca2+, and reversibly blocked by gadolinium. Colchicine and cytochalasin D reduced the activities of the two MS channels, indicating that cytoskeletal elements support mechanosensitivity. In DRG neurons, both types of MS channels were found primarily in neurons with diameters less than 30 ?. Our study identifies two distinct types of MS channels in sensory neurons that probably give rise to the observed mechanosensitive whole-cell current. Thus, these MS channels in sensory neurons may transduce mechanical stimuli to neural signals involved in somatosensation including pain.

[PB3-4] [10/18/2001 (Thr) 14:00 - 17:00 / Hall D]

Effects of cholinesterase inhibitors on neuronal injuries induced by glutamate, NMDA, Ab25-35, and oxidative insults

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Alzheimer's disease (AD) involves neuronal degeneration with impaired cholinergic transmission, particularly in areas of the brain associated with learning and memory. Several cholinesterase inhibitors