Kim Yu Mi°, Lee Jae Joon, Yin Shou Yu, Hong Jin Tae, Lee Myung Koo

College of Pharmacy, Chungbuk National University, Cheongju 361-763, Republic of Korea

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

Mechanosensitive Ion Channels in Sensory Neurons

Cho HaWon°, Koo JaeYeon, Kim SangSeong, Shin JiEun, Hwang SunWook, Lee SoonYoul, Oh Uhtaek

Sensory Research Group, National Creative Research Initiatives, College of Pharmacy, Seoul National University, San 56-1, Shinlim, Kwanak-Gu, Seoul 151-742, Korea

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

Cho JungSook°, Dok Go Hyang, Lee KwangHeun

School of Medicine, Dongguk University

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