【P-21】

A Toxicogenomic Study to Assess Neurotoxic Mechanism of Methylmercury

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Methylmercury (MeHg) is a well-known neurotoxicant that causes severe damage to the central nervous system in humans. Many reports have shown that MeHg is poisonous to human body through contaminated foods and has released into the environment. Despite many studies on the pathogenesis of MeHg-induced central neuropathy, no useful mechanism of toxicity has been established so far. In this study, suppressive subtractive hybridization (SSH) was performed to identify differentially expressed genes on human neuroblastoma cell line, SH-SY5Y treated with DMSO and MeHg (6.25 uM) for 6 hr. Differentially expressed cDNA clones were sequenced and were screened by dot blot to eliminate false positive clones. 13 of 35 screened genes were confirmed using real time RT-PCR. These genes include EB1, 90-kDa heat-shock protein, chromosome condensation-related SMC-associated protein and brain peptide A1, etc. Analysis of these genes may provide an insight into the neurotoxic effects of MeHg in human neuronal cells and a possibility to develop more efficient and exact monitoring system of heavy metals as ubiquitous environmental pollutants.

Keyword : Methylmercury, suppressive subtractive hybridization,neuronal cells