Toxicogenomic Solution (I) on Neurotoxicity of Methylmercury : Selenoprotein W as Molecular Target at the Late Phase after Mehtylmercury Exposure in SH-SY5Y human neuroblastoma cell line

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From our previous transcriptional profiling study, we identified that selenoprotein W was down-regulated in SH-SY5Y neuroblastoma cells exposed 1.4 uM methylmercury (MeHg) for 12, 24, 48hr. To further investigate the effects of MeHg on selenoenzymes in the human neuroblastoma cells and especially, to understand the mechanism on down-regulation of selenoprotein W by MeHg, mRNA levels of selenoenzymes, selenoprotein P (SelP), W (SelW), glutathione peroxidase 4 (GPX4), 5-iodothyronine deiodinases (5-DI) and 5'-DI were evaluated using real time RT-PCR. In early phase, MeHg did not affect the level of SelW and 5-DI, while it significantly inhibited expression of SelP, but increased in the level of 5'-DI. And in the late phase, MeHg did not affect the level of SelP and 5'-DI, while it significantly inhibited expression of SelW. GPX4 decreased in the early and late phase. This results suggest that MeHg specifically altered the metabolism of Se and regulation of selenoenzymes in neuronal cells. Significance of the phase dependent alteration of the activities of selenoenzymes such as SelP, SelW, GPX4, DIs by MeHg exposure, especially sel W as molecular target in the late phase are discussed in relation to the neurobehavioral toxicity of MeHg.