1-P-016

Poster Sessions

Activation of toll-like receptor 4 induces downregulation of $\alpha 7$ nicotinic acetylcholine receptor in microglia

Yoki Nakamura¹, Sayuri Kimura¹, Masatoshi Takemura¹, Keitaro Kodama¹, Momoka Iwamoto¹, Kazue Nakashima¹, Yoshihiro Nakata¹, Norimitsu Morioka¹

¹*Dept. Pharmacol., Grad. Sch. Biomed. & Health Sci., Hiroshima Univ.*

Background: Inflammatory responses could be involved in induction of Alzheimer's disease (AD). Microglia are known to act as the main immunologic effector cell in the central nervous system, and contribute to the pathological states of AD. Activation of $\alpha 7$ nicotinic acetylcholine receptor ($\alpha 7$ -nAChR) potentiated microglial phagocytosis of amyloid- β . By contrast, $\alpha 7$ -nAChR was decreased along with the progression of AD in rodent models. The current study has investigated the mechanisms underlying downregulation of microglial $\alpha 7$ -nAChR expression by activation of toll-like receptor 4 (TLR4).

Method: Mice microglial cell-line BV2 cells were used for investigation of downregulation of $\alpha 7$ -nAChR expression. The mRNA expression levels of $\alpha 7$ -nAChR was measured by the real-time PCR.

Results: Treatment of BV2 cells with lipopolysaccharide (LPS) significantly decreased the expression of $\alpha 7$ -nAChR in dose- and time dependent manner. The LPS-induced downregulation of $\alpha 7$ -nAChR mRNA was mediated by TLR4 and histone deacetylase (HDAC), but not DNA methyltransferase.

Conclusion: The current study demonstrated that the TLR4-HDAC pathway might contribute to the downregulation of $\alpha 7$ -nAChR in microglia.