https://doi.org/10.17816/MAJ191S115

PLASMALOGENS ENHANCE SPATIAL MEMORY BY INCREASING SYNAPTIC PLASTICITY

Md. Sh. Hossain[1], T. Fujino[2]

[1] Department of Neuroinflammation and Brain Fatigue Science, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan;
[2] Institute of Rheological Functions of Food, Fukuoka, Japan

It was previously known that the plasmalogens (Pls) are reduced in the Alzheimer's disease (AD) brains. The clinical study showed that the oral intake of sPls (Pls extracted from the scallop) improved the cognition among mild AD patients. To examine whether Pls regulate memory processes, we reduced the Pls in murine brain hippocampus by shRNA against *Gnpat* (shGNPAT) and observed a significant reduction of spatial memory. This evidence suggest that Pls have an important role in the hippocampal dependent memory. This was further supported by our recent findings that Pls drinking for three months in adult B6 mice improved spatial memory by enhancing the BDNF-TrkB signaling which was associated with an increased expression of synaptic related gene expression. The Pls treatments increased the dendritic spines in the cultured neuronal cells and also in the murine brain. Our research findings indicate that Pls regulate the spatial memory in mice by regulating the gene expression related to memory processes. Our results may suggest that Pls drinking may also increase the memory related gene expression in the AD patients to improve the cognitive function.

Keywords: plasmalogenes; synaptic plasticity; Alzheimer's disease; neurodegenerative disease.