

*Forum Minireview***Neuroprotective and Ameliorative Actions of Polyunsaturated Fatty Acids Against Neuronal Diseases — Evidence From Basic to Clinical Studies:****Preface**Tomohito Hamazaki^{1,*} and Michio Hashimoto²¹*Department of Clinical Sciences, Institute of Natural Medicine, University of Toyama, 2630 Sugitani, Toyama-city, Toyama 930-0194, Japan*²*Department of Environmental Physiology, Shimane University Faculty of Medicine, 89-1 Enyacho, Izumo, Shimane 693-8501, Japan*

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The brain is completely different from other tissues. One of the most distinct aspects of the brain is its abundance in membranes, which contain tremendous amounts of cholesterol and phospholipids with arachidonic and docosahexaenoic acids. Those fatty acids are sold as brain supplements. However, scientific evidence for the effects of those fatty acids on brain functions is not necessarily sufficient. A symposium was held to clarify the neuroprotective and ameliorative actions of polyunsaturated fatty acids (PUFA) at the 83rd Annual Meeting of The Japanese Pharmacological Society held in March 2010, in Osaka, Japan.

Four invited scientists discussed animal and human studies about the effects of PUFA on brain functions. M. Hashimoto showed the protective effects of n-3 PUFA, especially docosahexaenoic acid (DHA), against Alzheimer's disease using a rat model and the DHA-induced inhibition of amyloid fibrillation and discussed the mechanism of the protective effect of DHA. T. Moriguchi showed the change in the emotional behavior as a brain function in n-3 PUFA-deficient mice, and discussed the relation between the fatty acid composition and the sensitivity of the mild stress (1). T. Hamazaki conducted a number of intervention trials with fish oil and discussed the beneficial effects of fish oil administration on hostility (2). T. Yamashima focused on the functions of a fatty acid receptor, GPR40 (G protein-coupled

receptor 40), in the brain and proposed new links between PUFA, GPR40, and adult hippocampal neurogenesis.

Among these four presentations in the symposium, we show two topics with their detailed discussions and proposals here in this Forum Minireview series (3, 4). We hope that these inspire pharmacology researchers to find new facets of brain research.

References

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