

*Forum Minireview***Pharmacology in Health Foods:
Preface**Masanori Yoshizumi^{1,*} and Yasuo Matsumura²¹Department of Pharmacology, Nara Medical University, School of Medicine, Nara 634-8521, Japan²Laboratory of Pathological and Molecular Pharmacology, Osaka University of Pharmaceutical Sciences, Osaka 569-1094, Japan

Received December 6, 2010; Accepted December 7, 2010

Keywords: health food, Flavangenol, quercetin glucuronide, polyunsaturated fatty acid, metabolic syndrome

Since the people of Japan are becoming more and more concerned about their health, the consumption of health foods, including dietary supplements, functional foods, and food constituents has increased. In 2010, the Japanese health food market amounted to 3 trillion yen, and it continues to expand. However, health damage by bad quality health foods or believing in untrue marketing statements is now a nationwide problem in Japan.

In this Forum Minireview series, we have discussed the pharmacological benefits and risks of health foods from the aspects of basic research, product development, and post-marketing surveillance. We objectively evaluated health foods in pharmacology to provide the current status of health foods in Japan.

Ohkita et al. showed improvement in vascular endothelial function by treatment with French maritime pine bark extract (Flavangenol) (1). They also showed that Flavangenol suppresses activation of nuclear factor- κ B (NF- κ B) and expression of adhesion molecules in cultured vascular endothelial cells. Antihypertensive effects of Flavangenol were observed, which suggested that Flavangenol supplementation may be a promising candidate for endothelial dysfunction improvement and vascular disease prophylactic treatment.

Ishizawa et al. revealed quercetin metabolism in vivo and its protective effect against arteriosclerosis (2). Quercetin aglycone is metabolized to quercetin 3-*O*- β -D-glucuronide (Q3GA) in vivo. They showed that platelet-derived growth factor-induced cell migration and proliferation were inhibited by Q3GA in cultured vascular smooth muscle cells (VSMCs). Q3GA attenuated angio-

tensin II-induced VSMC hypertrophy via its inhibitory effects on the JNK and AP-1 signaling pathways. They suggested that Q3GA may be an active metabolite of quercetin in plasma and may possess preventative effects against arteriosclerosis relevant to VSMC disorders.

Kiso showed the beneficial effects of arachidonic acid (ARA) and docosahexaenoic acid (DHA) for age-related decline in brain and cardiovascular system function (3). He showed that ARA supplementation can improve cognitive function in healthy elderly men and that supplementation with both ARA and DHA can improve cognitive dysfunction due to organic brain damage or aging. ARA and DHA supplementation also increases coronary flow velocity reserve in elderly individuals; this suggests beneficial effects of polyunsaturated fatty acids on coronary microcirculation. He suggested that ARA and DHA may be beneficial in preventing and/or improving age-related declines in brain and cardiovascular system function.

Sakane described merits and demerits of “food with health claims” for prevention of obesity and metabolic syndrome (4). He emphasized that it is necessary to provide information to consumers through the media about the safety/effectiveness of health foods and food elements and laws pertaining to these foods. Consumers should also be made aware of reports on health disturbances associated with health foods around the world.

This Forum Minireview series is based on the symposium “Pharmacology in Health Foods” at the 83rd Annual Meeting of The Japanese Pharmacological Society held on March 17, 2010.

*Corresponding author. yoshizu@naramed-u.ac.jp

Published online in J-STAGE on March 24, 2011 (in advance)

doi: 10.1254/jphs.10R35FM

References

- 1 Ohkita M, Kiso Y, Matsumura Y. Pharmacology in health foods: Improvement of vascular endothelial function by French maritime pine bark extract (Flavangenol). *J Pharmacol Sci.* 2011;115:461–465.
- 2 Ishizawa K, Yoshizumi M, Kawai Y, Terao J, Kihira Y, Ikeda Y, et al. Pharmacology in health foods: Metabolism of quercetin in vivo and its protective effect against arteriosclerosis. *J Pharmacol Sci.* 2011;115:466–470.
- 3 Kiso Y. Pharmacology in health foods: Effects of arachidonic acid and docosahexaenoic acid on the age-related decline in brain and cardiovascular system function. *J Pharmacol Sci.* 2011;115:471–475.
- 4 Sakane N. Pharmacology in health foods: Merits and demerits of food with health claims for the prevention of metabolic syndrome. *J Pharmacol Sci.* 2011;115:476–480.