No. 1837

# Study on Novel Food-Derived Antihypertensive Molecules Acting on the Gastrointestinal Tract

Kousaku Ohinata

Division of Food Science and biotechnology, Graduate School of Agriculture, Kyoto University

Summary

The gastrointestinal tract, an interface between external and internal milieu, defends against pathogens and potentially injurious chemicals, and absorbs nutrients. It is also known that the gut senses ingested ruminal contents and the gut-derived signal is conveyed to the central nervous system (CNS) via neuronal or hormonal pathways. We found that Phe-Trp (FW), induced the most potent enteroendocrine cell responses out of total 338 dipeptides. In this study, we investigated effect of food protein-derived peptide with FW sequence on the cardiovascular system.

A pentapeptide with FW sequence, which was effectively produced by enzymatic digestion of bovine serum albumin, decreased blood pressure after oral administration in spontaneously hypertensive rats (SHRs). The pentapeptide exhibited vasorelaxing activity isolated from mesenteric artery of SHRs. Nitric oxide (NO) and prostaglandins (PGs) are known to be vasorelaxing factors; however, the vasorelaxing activity was inhibited by neither *N*G-nitro-L-arginine methyl ester (L-NAME), a NO synthase inhibitor, nor indomethacin, a COX inhibitor. Interestingly, this activity was blocked by lorglumide, an antagonist of the cholecystokinin $(CCK)_1$ receptor; It stimulated cholecystokinin (CCK) secretion in the enteroendocrine cells and exhibited vasorelaxing and antihypertensive effects via the CCK1 system. Taken together, a novel CCK-dependent vasorelaxing pentapetide decreases blood pressure in SHRs.