

Integrative Approach to “Healthy Aging” in Japan: Role of Food Factors

Toshikazu Yoshikawa

Graduate School of Medicine, Kyoto Prefectural University of Medicine

An energetic and long-lived society could be created with preventing the occurrence of lifestyle related diseases, including cancer, diabetes and cerebral and cardiovascular disorder. Therefore, the project for the prevention of lifestyle-related disease is listed as one of the priority research subjects not only in Japan but also in Western countries. The aim of “anti-aging medicine” is to promote “health longevity”, by the intervention in a biological process of the aging and by lowering the onset of age-associated diseases including atherosclerosis and cancers. Although multiple factors are involved in the development of these diseases, a key future challenge is to clarify these factors, invent a method detecting any changes in the initial phase, and establish a diagnostic approach that applies to prevention studies by food factors. Especially, the use of disease prevention biomarkers are considered particularly effective to evaluation of functional food designed for the pre-disease status, which currently attracts massive attention.

One of the mass spectrometry methods, the SELDI-TOF-MS technology (ProteinChip system) is very effective in the comprehensive analysis of proteins and peptides in the body fluid specimen. Recent our investigation has revealed that the ingestion of water-soluble dietary fiber prevents the development of symptoms of metabolic syndrome and insulin resistance in Otsuka Long-Evans Tokushima Fatty (OLETF) rat. Using the serum obtained from this experiment, we have succeeded to determine two candidates as a biomarker to diagnose the pre-disease status (high-risk group for metabolic syndrome); apolipoprotein CII and cysteinylated transthyretin. In addition, these two proteins were determined in human serum and the preliminary study has demonstrated that these markers are decreased after the 4-weeks treatment with the water-soluble dietary fiber in human. In conclusion, the comprehensive discovery of disease prevention markers associated with lifestyle related diseases will pave the way for the profiling of the risk of disease occurrence with the use of these markers and lead to the development of a new health check system that will contribute to preventive medicine in the field of food factor research.