

Probiotic Interventions for Inflammatory Metabolic Disorders

Sae-Hun Kim

Department of Food Bioscience and Technology, College of Life Science and Biotechnology,
Korea University, Seoul 136-701, South Korea

Email: saehkim@korea.ac.kr

Abstract

The current global metabolic syndrome pandemic is accompanied by an alarming increase in the prevalence of a wide range of metabolic diseases, especially atherosclerotic cardiovascular disease, diabetes, osteoporosis, liver disease, chronic kidney disease, and male hypogonadism. Recent discoveries have often highlighted that inflammation could serve as the prominent pathogenetic denominator and/or predictor of human longevity in these metabolic diseases. Consequently, much effort is being devoted to the development of an anti-inflammatory diet targeting both innate and adaptive immunity which play pivotal roles in regulating inflammation. It has been proposed that a diet containing probiotics may lower levels of pro-inflammatory markers in the body, which in turn attenuates metabolic syndrome and extends life span. More recent studies have associated probiotics with improved obesity-induced metabolic diseases. *In vivo* and some clinical studies have demonstrated that probiotics could downregulate C-reactive protein, adipokine-produced pro-inflammatory cytokines, and monocyte inflammation protein. Probiotics have also been shown to improve gut microbiota, intestinal IgA⁺, and phagocytic activity of macrophages in the intestine, and thereby lower the incidence of systemic inflammation in diabetes and cardiovascular diseases. Furthermore, probiotics were also shown to be capable of reducing oxidative stress and intestinal TNF- α level, and enhancing bone density in subjects with inflammatory bowel disease associated osteoporosis. In addition, *in vivo* studies have also revealed that probiotics could treat liver disease by suppressing circulating pro-inflammatory markers, and modulating both gut microbiota and intestinal metabolites. Probiotics have also been suggested to modulate toll-like receptor/transcription factor-mediated inflammatory signaling pathways that are responsible for male hypogonadism and kidney disease. My talk highlights the biological mechanisms underlying inflammation in metabolic disease, and putative role of probiotics in the modulation of both immune and metabolic homeostasis.

Biography

Sae-Hun Kim is a Professor in the Department of Food Bioscience and Technology, College of Life Science and Biotechnology, Korea University, South Korea. He completed his PhD majoring in Food Science at Oklahoma State University, Oklahoma, USA in 1992. He has published over 55 papers in SCI journals, and 5 book chapters. He was the chairman of Korean Dairy Technology and Science Association. He also serves as an Editorial Board member of Current Topics in Lactic Acid Bacteria and Probiotics. Prof. Kim has also attended and delivered lecturers at domestic and international academic conferences and congresses. His research interests focus on probiotics and probiotic-derived bioactives for inflammatory and age-related diseases, and the development of functional bio-products.