Improvement of immunity in the elderly by probiotic bacteria

Mitsuo Maruyama

Deputy Director, Department Head of Mechanism of Ageing, Research Institute,
National Center for Geriatrics and Gerontology, Japan

E-mail: michan@ncgg.go.jp

Abstract

With advancing age, immune function and responses, for instance, lymphocyte activation and antibody or cytokine secretion are gradually fragile and reach immunosenescence, which contributes to increased number of age-related diseases such as infectious disease or cancer in the elderly. Currently the mechanisms of immune fragility especially, aged immunological responses, such as susceptibility to infection or reduced response to vaccination has been focused in not only innate and acquired immunity but also in gut immunity through external infection or nutrition intervention. It has been shown that some probiotic bacteria were effective in the robustness of host immune defense against infection. Age-related alterations of microbial flora in the gut have an impact on the gut immune system and therefore, it is proposed that changes of the gut microbiota by pre- and probiotics could offer an opportunity to improve immune responses against viral infection and vaccination in the elderly. Here, I would like to introduce our recent topics about effective roles of probiotic bacteria (Bifidobacterium and Lactobacillus) in enrichment of influenza virus vaccination efficacy and mucosal IgA secretion in animal or clinical study. Actually we revealed that oral administration of *Lactobacillus paracasei* MCC1849 promotes not only IgA secretion but also IgA+ cell proliferation in peyer's patchs from aged mice. Furthermore, MCC1849 enhances antibody responses against the influenza virus vaccination in the elderly. These findings provide immunomodulatory effects of probiotics in the elderly immune function.

Biography

Mitsuo Maruyama was awarded a degree of Ph.D at division of Molecular Biology, Osaka University in 1989. During the following more than ten years, he has continued to study and work in molecular virology and molecular immunology with mouse genetics as a faculty member in Kyoto University and Cologne University, Germany, respectively. Since he was recruited as a principle investigator of NILS in 2001, he has devoted his research interest into molecular aging researches, such as molecular mechanisms of cellular senescence, aging and age-related diseases or molecular analysis of immunosenescence. Currently he is also strongly involved in molecular mechanism of gut immunity with nutritional intervention. Mitsuo is currently a member of an executive board of Japan Society for Biomedical Gerontology as well as visiting professor in the Nagoya university graduate school of medicine.