

***Lactobacillus paracasei* subsp. *paracasei* NTU 101 Enhance Innate Immunity Accompany Regulation of Intestinal Probiotics**

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Lactic acid bacteria (LAB) have been suggested to confer a range of health benefits including immunomodulation of intestine microflora. In the present study, the mechanism of enhancing innate immunity by *Lactobacillus paracasei* subsp. *paracasei* NTU 101 (LP-101) which isolated from human infant feces was investigated. Sprague-Dawley (SD) rats and BALB/c mice that received 10^9 CFU/mL LP-101 in 0.1 mL MRS broth by oral administration once a day for 0, 3, 6 and 9 weeks. The effect of LP-101 on regulation of intestinal microorganisms were determined by cultivation of fecal or cecum materials and the enhancements of innate immune response in spleen were assayed by flow cytometry. In the experiments of SD rats, the numbers of bifidobacteria and lactobacilli in fecal were increased after fed for 6 and 9 weeks, respectively. Whereas, the numbers of *Clostridium perfringens* were decreased after fed for 6 weeks. The numbers of lactobacilli and bifidobacteria in cecum specimens were also increased and *C. perfringens* decreased after fed for 9 weeks. The results of innate immune response assay indicated that LP-101 significantly enhanced MHC (major histocompatibility complex) class II expression on dendritic cell and macrophage when compared with the control group after fed for 3 and 6 weeks. Moreover, the MHC class II activities were continued expression even at later 7 days after 6 and 9 weeks feeding. On the other hand, the phagocytosis of macrophages were decreased when fed with LP-101 for 3, 6 and 9 weeks, but their ability was recovered to normal level when the feeding terminated. The activities of natural killer (NK) cells were evaluated by NKG2D (natural killer group-2 D) expression that could further trigger NKG2D-mediated cytotoxicity. The data indicated that NKG2D expression increased after fed for 9 weeks, and expressed continuously after fed terminated. The findings in this study demonstrated that supplementation of the diet with LP-101 was able to enhance innate immune responses that accompany regulation of intestine microorganisms.