

# Effect of LAB Probiotic Strains on Cytokines Synthesis in Mouse Macrophage

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## Abstract

The balance between immunogenic and tolerogenic activities in human immune system strongly depends on microflora-induced pro- and anti-inflammatory activities. Lactic acid bacteria (LAB) are important components of microflora. LAB could modulate the gut mucosal immune system via activation of macrophages and production of cytokines. In several cytokines, IL-6 is a pleiotropic cytokine that can affect T cells, B cells, and macrophages, IL-12 is a heterodimer that can upregulation of the Th1 response via induction of TNF- $\gamma$  production, T-cell proliferation, and NK cell-mediated cytotoxicity, and IL-10 was anti-inflammatory cytokine which secreted by Th2 phenotype cells reduces secretion of Th1 cytokines, suppresses macrophage activation, and possibly even influences cytotoxic T cells and NK cells. In this study, we use an in vitro assay system with mouse macrophage cell culture. The concentrations of IL-12 p40p70, IL-10 and IL-6, which was released from macrophage by stimulating with probiotic, were determined.

Twenty-four strains were isolated from some Taiwanese local fermented vegetable and some animal excreta. These strains could tolerance low pH and high concentration bile salt and were tested with stimulate immune response ability. As the results, all strains could stimulate macrophage to release cytokines IL-12 p40p70, IL-10 and IL-6. Three strains (E30, E33, and B7) could produce higher concentration of cytokines whether IL-12 p40p70 and lower levels of IL-10 compared to commercial probiotic strain *Lactobacillus* GG (LGG) and *Lactobacillus casei* Shirota (LcS). These strains were identified as *Lb. casei*, and *Lb. rhamnosus* by 16S rRNA PCR product and API CHL50 system analysis.

**Key words:** probiotic, immune response, IL-12 p40p70, IL-10, IL-6