

INTESTINAL IMMUNE REGULATION ACTIVITY AND MECHANISM OF POLYSACCHARIDE FROM LONGAN PULP

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ABSTRACT

The numerous health benefits of longan (*Dimocarpus longan* Lour.) pulp are related to its polysaccharides which exhibited immunomodulatory activities. Since the human genome does not encode adequate carbohydrate active enzymes, it is difficult to digest and absorb orally polysaccharides in the gastrointestinal system. How does longan polysaccharides (LP) with oral administration exert its immunomodulatory activities in vivo is unknown. Therefore, the cyclophosphamide-induced immunosuppressed Balb/c mice model was performed to investigate the immunomodulatory mechanism of LP. Different doses of LP (100, 200 and 400 mg/kg) was treated with mice for 4 weeks. Then serum samples and intestinal washes were collected for Ig and cytokines analysis, and small-intestine walls were excised for gene expression assessment and intestinal architecture analysis, while mesenteric lymph nodes (MLNs) and spleen were removed to detect cell proliferation and the distribution of cell subsets. Results showed that LP exerted the humoral immunity regulation in intestinal immune system via increasing the TGF β , CCR9, CCL28 and CCR10 mRNA expression to promote the class switching and homing of IgA-antibody-secreting cells, and upregulating the pIgR and IgA mRNA expression to produce more S-IgA in a dose-dependent manner. Moreover, LP strengthened intestinal mucosal barrier by increasing the expression of ZO-1, claudin-1, occludin, and E-cadherin. In addition, LP regulated the cellular immunity by stimulating the lymphocyte proliferation, increasing the number of CD3+CD4+ T cells and the ratio of CD3+CD4+/CD3+CD8+, regulating Th1/Th2 cytokines balance from MLNs cell in intestinal immune system. LP increased the thymus and spleen indices, elevated IgA, IgG and IgM levels in serum, stimulated spleen lymphocyte proliferation to exert the systemic immunomodulatory regulation. In summary, LP can regulate the immune status of the body by promoting intestinal mucosal immunity and mucosal barrier. The results may have important implications for longan application as an immune-enhancing functional food ingredient.

Keywords: Longan polysaccharide; intestinal immune; systemic immune