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In vivo immunostimulatory activity of chitosan oligosaccharides

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Background & Aim: Chitooligosaccharides (COS) are hydrolyzed products of chitosan and have been reported to have various biological functions. The aim of this study was to evaluate the immunostimulatory activity of COS *in vivo*.

Methods: Immunomodulation activities of COS were detected using normal mice, cyclophosphamide-treated immunosuppressed mice and irradiation injury mice. The effect of COS in the immune organs index and phagocytic rates of peritoneal macrophages were measured in the normal mice. The white blood cell counts, lymphocytes proliferation, natural killer cell activity and antioxidant enzyme activity were evaluated after COS administration in the cyclophosphamide-treated immunosuppressed mice. The effect of COS in survival period in the irradiation injury mice was also studied.

Key findings: In the normal mice model, the administration of COS didn't have adverse effect on immune organs and improved the phagocytic rates of peritoneal macrophages ($P < 0.05$ at 80 mg/kg). Similarly, we manifested that the COS significantly restored the decreased white blood cell counts, lymphocytes proliferation ($P < 0.01$ at 80 mg/kg), natural killer cell activity ($P < 0.01$ at 80 mg/kg) and antioxidant enzyme activities ($P < 0.01$ at 80 mg/kg) in the cyclophosphamide-induced immunosuppressed mice model. COS can also improve the survival rate in irradiation injury mice, significantly increase the spleen indices and up-regulate the CD4+/CD8+ ratio in the splenocytes.

Significance: The COS had potential immunostimulatory activities, and it may be applied to patients with inadequate immune functions or developed as an agent in the functional food and pharmaceutical industries.

Biography

Xingchen Zhai, a 2nd year PhD candidate from Department of Food Science and Engineering, School of Chemical Engineering & Technology, Harbin Institute of Technology (HIT), Harbin, P.R. China. At present, she has been working as a visiting student at Beijing Institute of Radiation Medicine to develop her PhD project since last year. During the period, she has learned various skills in animal experiments, including establishment of animal model (such as subcutaneous tumor model, orthotopic tumor model and residual tumor model after surgical treatment), multiple drug administration methods, and a variety of techniques for tumor pharmacology (flow cytometric analysis, fluorescent quantitative real-time PCR and *in vivo* imaging etc. are included). Now her research is focused on the immunomodulation and antitumor effect of chitosan oligosaccharide.

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