

## Anti-tumor/metastatic activity of $\beta$ -glucan purified from mutated *Saccharomyces cerevisiae*

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### Abstract

We here demonstrate the evidence of increased anti-tumor and immunostimulating activities of  $\beta$ -glucan (IS2) purified from mutated *Saccharomyces cerevisiae* compared to the wild type *S. cerevisiae*. In experimental lung metastasis of colon26-M3.1 carcinoma or B16-BL6 melanoma cells, prophylactically intravenous (i.v.) administration of  $\beta$ -glucan purified from mutated *S. cerevisiae* significantly inhibited lung metastasis in a dose-dependant manner. In an assay of liver and spleen metastasis produced by i.v. inoculation of L5178Y-ML25 cells, IS2 also significantly protected the metastasis in CDF1 mice. Furthermore, pretreatment with IS2 2 day before tumor inoculation resulted in a significantly prolonged survival time of tumor-bearing mice, although all mice had virtually succumbed with 36 days after tumor inoculation. In an *in vitro* cytotoxicity analysis, IS2 at the concentration up to 500 mg/ml did not affect the growth of colon26-M3.1 cells. In contrast, IS2 showed the enhancement of splenocyte proliferating activity in a dose-dependent manner. Peritoneal macrophage stimulated with IS2 produced various cytokines such as IL-1 $\beta$ , TNF- $\alpha$ , IFN- $\gamma$  and IL-12. The depletion of NK cells by injection of rabbit anti-asialo GM1 serum abolished the inhibitory effect of IS2 on lung metastasis of colon26-M3.1 cells. These data suggest that IS2 has antitumor activity to inhibit tumor metastasis, and its antitumor effects is associated with activation of macrophages and NK cells.