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Effect of Ginsenosides and Red Ginseng Water Extract on Tumor Necrosis Factor- α Production by Rat Peritoneal Macrophages

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The effects of ginsenosides and extracts containing melanoidins, which are components of red ginseng, on TNF- α production by rat peritoneal macrophages were examined. The ginsenosides by themselves had no effect on TNF- α production, whereas water extract containing melanoidins, which are Maillard reaction products, stimulated TNF- α production by rat peritoneal macrophages. The total ginsenoside fraction and ginsenoside Rc increased TNF- α production with LPS, as did stimulation by ginsenosides with the water extract. These results suggest that for a healthy immune response it might be better to consume red ginseng itself, which contains a mixture of ginsenosides, polysaccharides and Maillard reaction products, rather than ingesting pure ginseng alone. Red ginseng as an immunomodulator may be effective in defending against infections or tumors.

Keywords: [red ginseng](#), [macrophage](#), [tumor necrosis factor](#), [ginsenoside](#), [polysaccharide](#), [melanoidin](#)

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