

Screening of anti-inflammatory active compound from *Agaricus brasiliensis*

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Introduction

The mushrooms have been used as traditional medicine in the Asian countries. *Agaricus brasiliensis* is a basidiomycete that is well known as God's mushroom and Himematsutake in Japan. Many biological effects of mushroom extracts have been reported such as anti-cancer, immunostimulatory activity and antiviral activity. However, the only polysaccharides from this mushroom have been report as anti-inflammatory. In this study, we isolated and purified new active compound that has anti-inflammatory in human and mouse macrophage cells. We also characterized structure of active compound by NMR and MASS. Furthermore, we are investigating mechanism of anti-inflammatory by new compound.

Results

1. Inhibition of nitric oxide (NO) production

A. blazei powder was extracted and isolated. The compound A was purified and characterized structure by NMR and MASS. The compound A from *A. blazei* was evaluated NO production in Lipopolysaccharide (LPS)-stimulated mouse leukemic monocyte macrophage cell lines (RAW 264.7). The results showed that compound A at 50 μM to 600 μM reduce NO production significantly in Figure 1.

2. Anti-inflammatory by inhibition of TNF α production

The human monocytic cell lines (THP-1) were induced by 100 nM Phorbol 12-myristate 13-acetate (PMA) for macrophage differentiation. The macrophage differentiation THP-1 cells were treated with LPS and different concentrations of compound A. The production of TNF α was measured by ELISA. The results showed that TNF α production was reduced by compound A at 150 μM to 600 μM significantly in Figure 2.

Discussion

Macrophage cells play important roles in inflammatory through production of proinflammatory mediators, including NO and TNF α . LPS are gram-negative bacteria that activate macrophage to induce proinflammatory cytokines. The conjugated compound A has been reported as anti-inflammatory in bowel disease, diabetes and allergy. In this study, natural compound A from *A. blazei* decreased proinflammatory production of NO and TNF α significantly. This study may lead to discover prevention of inflammatory disease by compound A in further. Moreover, we are investigating their anti-inflammatory mechanisms via NF- κ B pathway that regulate the expression of inducible NO synthase and TNF α .

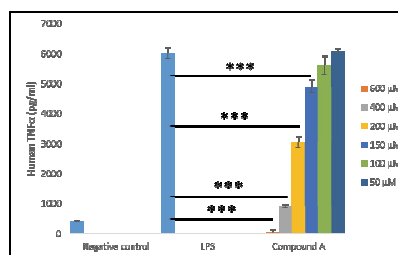
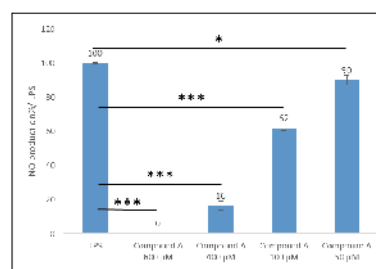


Figure 1. Percentage of NO production compared with LPS

Figure 2. The production of TNF α by ELISA

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 (2) *Agaricus brasiliensis*
 (3) mushroom
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