Ameliorating effect of Maoto on the production of inflammatory cytokines induced by polyI:C stimulation

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Maoto, a traditional Japanese medicine, is widely used for treatment of upper respiratory tract infections including influenza. In our previous study, we showed maoto significantly improved the acute inflammatory response and flu-like symptoms in a polyI:C (Toll-like receptor 3 ligand) challenged rat model. Here, we examined the mechanism of action of maoto by analyzing its effect on the immune cell response associated with acute inflammation.

Maoto (2 g/kg) was orally administered to mice concurrently with an i.p. injection of PolyI:C (6 mg/kg), and blood samples were obtained two hours later. Plasma cytokine levels were measured by ELISA. A marked reduction in the amount of polyI:C-induced tumor necrosis factor (TNF)-a production was observed in maoto-treated mice along with significant production of interleukin-10 (IL-10). In nude mice and IL-10 blocking antibody-treated mice, maoto significantly reduced the level of polyI:C induced TNF-a. These results suggested that maoto suppressed systemic inflammation through a T cell- and IL-10-independent mechanism. We further analyzed the direct anti-inflammatory effect of maoto *in vitro* using splenocytes following stimulation with polyI:C by fluorescence-activated cell sorting (FACS). Intracellular staining demonstrated that maoto inhibited production of TNF-a by monocytes and neutrophils. Taken together, these findings indicate that maoto modulates the secretion of inflammatory cytokines in response to polyI:C stimulation.