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Modulatory Effect of Hot Water Extract from *Scutelaria barbata* on the Functional Activation of Macrophages induced by Lipopolysaccharide

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Objectives

Scutellaria barbata was examined to evaluate its modulatory effects on the functional activation of macrophages under lipopolysaccharide (LPS) treatment. To do this, hot water extract (Sb-HWE) was prepared from *Scutelaria barbata* and several inflammatory parameters such as nitric oxide (NO) production, phagocytosis, reactive oxygen species (ROS) determination and intracellular signaling pathway were selected to be tested.

Materials and Methods

○ Materials

Hot water extract of *Scutellaria barbata* (Sb-HWE) was identified by Prof. Sun Gu Lee. DHR123 (Dihydrorhodamine123), sodium nitroprusside (SNP), FITC-dextran, MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphinyltetrazolium bromide), and lipopolysaccharide (LPS, E. coli 0111:B4) were purchased from Sigma (St. Louis, MO). LY294002, wortmannin, U0126, SP600125, and SB203580 were obtained from Calbiochem (La Jolla, CA). Fetal bovine serum (FBS) was obtained from Hyclone (Hyclone, South Logan, UT, USA). All other chemicals were Sigma grade.

○ Methods

To do these experiments, anti-inflammatory effects such as nitric oxide (NO) production, MTT assay, Luciferase Reporter Gene Activity Assay, phagocytosis, ROS determination and RT-PCR were tested according to previous methods using murine macrophage cell line and Human embryonic kidney cell line.

Results

Sb-HWE strongly blocked NO production in LPS-activated RAW264.7 cells in a dose-dependent manner. However, it did not suppress inducible NO synthase (iNOS). In agreement, Sb-HWP did not diminish inflammatory signaling composed of NF-kB and its upstream activation signaling enzymes such as Akt and IkBa. Sb-HWE protected RAW264.7 cells from LPS-induced cytotoxicity up to 80% at 400 mg/ml. Furthermore, this extract blocked phagocytic uptake of FITC-dextran, while sodium nitroprusside (SNP)-induced ROS generation in RAW264.7 cells was not decreased. fore, our data suggest that Sb-HWP may have differential immunoregulatory Therefunction depending on macrophage-mediated immune responses.

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Fig. 1 LPS-induced NO production and cell viability of Sb-HWE in RAW264.7 cells in a dose-dependent manner.

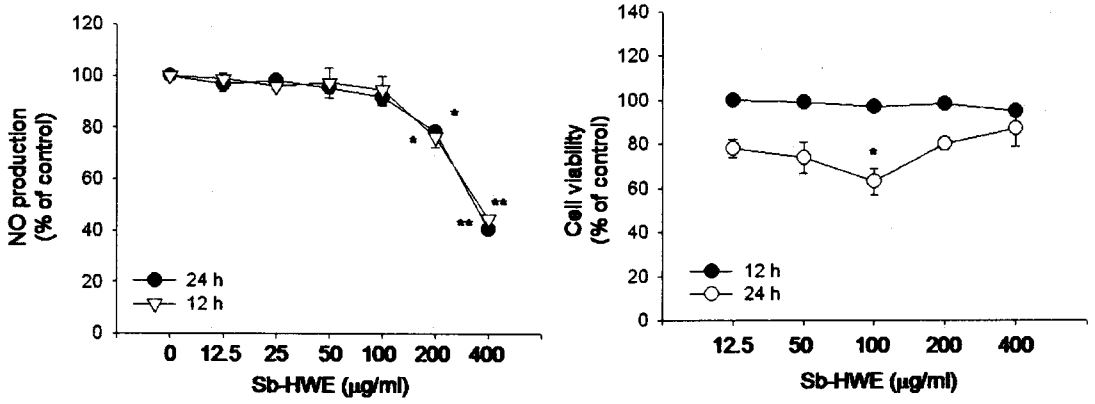

Fig.2 SNP-induced ROS generation and phagocytic uptake of Sb-HWE in RAW264.7 cells.