Screening and Studying Anti-inflammatory Effects of Various Herbal Extracts in Mouse Macrophages

許貴媄、蔡明勳

E-mail: 364812@mail.dyu.edu.tw

ABSTRACT

The inflammatory response is a part of the human immune system, and is also a necessary process of cure. However, when a persistent chronic inflammation happen, it will not only cause organ/tissue damage but also promote the proliferation of abnormal cells, then leading to many common diseases by scientific studies. Therefore, if we can prevent or treat inflammation, we can prevent or cure these diseases. However, some anti-inflammatory drugs have significant toxicity or side-effects. Accordingly, natural or herbal extracts with anti-inflammatory effects have become a good choice for anti-inflammatory pharmaceutical research and development. In this study, we evaluate twenty-one ethanol extracts of Chinese herbals or plants as research subjects. We use lipopolysaccharide (LPS)-induced RAW264.7 mouse macrophage as inflammatory cell model. We screened all these extracts to select which with anti-inflammatory activity according to their inhibition rates of NO productions. Preliminary results showed that four extracts, including Schisandra chillensis, Artemisia indica, Colocasia esculenta leaves and Alpinia officinarum, at concentration of 250 μg/mL exhibited significant anti-inflammatory activities. Therefore, we analyzed the anti-inflammatory effects of these four extracts at various concentrations (6.25~25 μg/mL) in LPS-induced macrophages. Results show that both extracts of Schisandra chillensis and Colocasia esculenta leaves not only promote the production of an anti-inflammatory interleukin-10 (IL-10), but also suppress LPS-induced inflammatory factors including Tumor Necrosis Factor-α (TNF-α), NO, Cyclooxygenase-2 (COX-2) and Prostaglandin E2 (PGE2). Extract of Artemisia indica suppresses LPS-indused NO, and reduces PGE2 production by inhibiting LPS-induced COX-2 level, but it doesn’t promote IL-10 and suppress LPS-indused TNF-α. Extract of Alpinia officinarum promotes IL-10 and suppresses the LPS-induced NO and PGE2, but it doesn’t suppress LPS-induced TNF-α and COX-2 level. In brief, we identify that ethanol extracts of Schisandra chillensis, Artemisia indica, Colocasia esculenta leaves and Alpinia officinarum have anti-inflammatory activities in LPS-induced RAW264.7 mouse macrophage model. The anti-inflammatory mechanisms of extracts from Schisandra chillensis and Colocasia esculenta leaves are clearer than the other two extracts. These four extracts may have potential to develop anti-inflammatory foods or drugs. Further researches are needed to decipher their anti-inflammatory mechanisms and effective concentrations.

Keywords : RAW264.7 mouse macrophages、anti-inflammatory activity、herbal and plant extracts

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