

Modulation of cytokine secretion by garlic oil derivatives is associated with suppressed nitric oxide production in stimulated macrophages

陳玉華;黃士懿

Hsiao-Pei Chang;Shih-Yi Huang;Yue-Hwa Chen

Abstract

We previously described that garlic oil derivatives differentially suppress the production of nitric oxide (NO) and prostaglandin E(2) (PGE(2)) in activated macrophages. In the present study, we investigated the effects of the garlic derivatives, diallyl sulfide (DAS), diallyl disulfide (DADS), and allyl methyl sulfide (AMS), on cytokine production in lipopolysaccharide (LPS)-stimulated RAW 264.7 cells, and the association between modulation of cytokines and inhibition of NO production was also assessed. The results indicated that these garlic compounds had different effects on the secretion of activated cytokines, including proinflammatory tumor necrosis factor-alpha (TNF-alpha), interleukin (IL)-1beta, and IL-6, as well as the antiinflammatory, IL-10. DAS inhibited the production of all stimulated cytokines in a concentration-dependent manner, and the inhibition was closely associated with the suppression of NO and PGE(2) production. DADS repressed the production of stimulated TNF-alpha and IL-10 and increased the production of activated IL-1beta and, to a lesser extent, IL-6; but only the decreased IL-10 production was associated with DADS-induced NO inhibition. Yet, the DAS- and DADS-suppressed NO production was independent of TNF-alpha. AMS, on the other hand, slightly suppressed the stimulated TNF-alpha but enhanced IL-10 production, and such modulation was closely associated with the decrease in NO production.