P4

Inhibitory effects of xanthorrhizol on inducible cyclooxygenase (COX-2) and nitric oxide synthase (iNOS) activity in RAW264.7 cells

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Prostaglandins and nitric oxide produced by inducible cyclooygenase (COX-2) and nitric oxide synthase (iNOS), respectively, have been implicated as important mediators in the process of inflammation and carcinogenesis. On this line, the potential COX-2 or iNOS inhibitors have been considered as anti-inflammatory or cancer chemopreventive agents. In this study, we investigated the effect of a natural sesquiterpenoid isolated from plants of Zingiberaceae family on the activities of COX-2 and iNOS in cultured lipopolysaccharide (LPS)-activated mouse macrophage cell RAW 264.7. Xanthorrhizol, a sesquiterpenoid, isolated from the rhizome of *Curcuma xanthorrhiza* Roxb. (Zingiberaceae), exhibited a potent inhibition of COX-2 (IC_{50} = 0.2 μg/ml) and iNOS activity (IC_{50} = 1.0 μg/ml) in the assay system of prostaglandin E_2 (PGE_2) accumulation and nitric oxide production, respectively. Western blot analyses revealed that the inhibitory potential of xanthorrhizol on the COX-2 and iNOS activity was well coincided with the suppression of COX-2 and iNOS protein expression. In addition, xanthorrhizol also suppressed the COX-2 mRNA expression in a dose-dependent manner. These results suggest that a natural sesquiterpenoid from *C. xanthorrhiza* might be a potential lead candidate for further developing COX-2 or iNOS inhibitor possessing cancer chemopreventive or anti-inflammatory activities.