Inhibitory Effects of Lycopene on the Induction of NO;Cytokines;and Mitogen-Activated Protein Kinase Expressions by Lipopolysaccharide in Primary Cultured Microglia

李玲玟

Kou G. Shyu;Wen C. Huang;Po A. Tai;George Hsiao;Duen S. Chou;Lin W. Lee;Jin S. Chen;Joen R. Sheu

摘要

Abstract

AbstractMicroglia are activated in response to brain injury and release neurotoxic factors including nitric oxide (NO) and proinflammatory cytokines such as tumor necrosis factor-alpha (TNF-alpha) and interleukin-lbeta (IL-10). Lycopene, a potent antioxidant, is known to inhibit brain injury. In this study, we found that lycopene (5-20muM) significantly inhibited lipopolysaccharide (LPS)-induced NO release in primary cultured microglia. Lycopene (5-20 muM) also concentration-dependently diminished the LPS-induced production of proinflammatory cytokines such as TNF-alpha and IL-lbetain microglia. Further study of the molecular mechanisms revealed that lycopene markedly inhibited extracellular signal-regulated kinase (ERK1/2) but not c-Jun N-terminal kinase (JNK1/2) or p38 mitogen-activated protein kinase (MAPK) phosphorylation stimulated by LPS in microglia. These results suggest that mi-croglial inactivation by lycopene is at least partially due to activation of ERK1/2 phosphorylation Therefore, inhibition of NO and proinflammatory cytokine production in activated microglia by lycopene may represent a powerful and potential therapeutic strategy for various neurodegen-erative diseases including ischemia-reperfusion cerebral infarction.