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Naringin Attenuates the Development of Carrageenan-Induced Acute Lung Inflammation Through Inhibition of NF-κb, STAT3 and Pro-Inflammatory Mediators and Enhancement of IκBα and Anti-Inflammatory Cytokines (Article)

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Abstract

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Naringin has been reported to possess diverse pharmacological properties, including anti-arthritic and anti-inflammatory activities. The aim of the present study was to determine the potential anti-inflammatory effect of naringin in a mouse model of carrageenan-induced pleurisy. A single dose of naringin (40 and 80 mg/kg) was administered per oral (p.o.) 1 h before carrageenan (Cg) administration. Pro- and anti-inflammatory cytokines were analysed in pleural fluid. We also assessed the effects of naringin on the expression levels of iNOS, inducible cyclooxygenase isoform (COX-2), ICAM-1, MIP-2, PGE2, STAT3, TGF-β1, nuclear factor kappa B (NF-κB) and inhibitor of kappa B (IκBα) in lung tissue. The histological examinations revealed anti-inflammatory effect of naringin while Cg group deteriorated. Naringin downregulated Th1 and upregulated Th2 cytokines. Western blot analyses revealed increased protein expression of NF-κB, STAT3 and COX-2 and decreased IκBα in response to Cg treatment, which were reversed by the treatment with naringin. In the Cg group, mRNA expression levels of pro-inflammatory mediators upregulated and anti-inflammatory mediators downregulated. Naringin reversed these actions. © 2014, Springer Science+Business Media New York.

SciVal Topic Prominence

Topic: Flavanones | Flavonoids | diabetic rats

Prominence percentile: 84.588

Author keywords

Carrageenan | Inflammatory mediators | Naringin | NF-κB p65 | STAT3

Indexed keywords

EMTREE drug terms: aurantiin | cyclooxygenase 2 | I kappa B alpha | immunoglobulin enhancer binding protein | inducible nitric oxide synthase | intercellular adhesion molecule 1 | macrophage inflammatory protein 2 | messenger RNA | prostaglandin E2 | STAT3 protein | transforming growth factor beta1 | antiinflammatory agent | aurantiin | autacoid | carrageenan | Chuk protein, mouse | cytokine | flavanone derivative | I kappa B kinase | immunoglobulin enhancer binding protein | STAT3 protein | Stat3 protein, mouse

EMTREE medical terms:

adult | animal cell | animal experiment | animal model | animal tissue | antiinflammatory activity | Article | carrageenan-induced pleurisy | controlled study | down regulation | enzyme inhibition | enzyme linked immunosorbent assay | female | histopathology | lung parenchyma | mouse | nonhuman | pleura fluid | protein expression | single drug dose | Th1 cell | Th2 cell | upregulation | Western blotting | animal | antagonists and inhibitors | Bagg albino mouse | dose response | metabolism | pleurisy

MeSH:

Animals | Anti-Inflammatory Agents | Carrageenan | Cytokines | Dose-Response Relationship, Drug | Female | Flavanones | I-kappa B Kinase | Inflammation Mediators | Mice | Mice, Inbred BALB C | NF-kappa B | Pleurisy | STAT3 Transcription Factor

Chemicals and CAS Registry Numbers:

aurantiin, 10236-47-2, 12619-61-3, 29658-83-1, 82350-96-7; I kappa B alpha, 151217-48-0; inducible nitric oxide synthase, 501433-35-8; intercellular adhesion molecule 1, 126547-89-5; prostaglandin E2, 363-24-6; carrageenan, 9000-07-1, 9049-05-2, 9061-82-9, 9064-57-7; I kappa B kinase, 209902-66-9;

Anti-Inflammatory Agents; Carrageenan; Chuk protein, mouse; Cytokines; Flavanones; I-kappa B Kinase; Inflammation Mediators; naringin; NF-kappa B; Stat3 protein, mouse; STAT3 Transcription Factor

Manufacturers:

Drug manufacturer:

Sigma Aldrich, United States

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