

Product Data Sheet

Product Name: Liquiritigenin

Cat. No.: GN10673

Chemical Properties

Cas. No. 578-86-9

Chemical Name (2S)-7-hydroxy-2-(4-hydroxyphenyl)-2,3-dihydrochromen-4-one

SMILES C1C(OC2=C(C1=O)C=CC(=C2)O)C3=CC=C(C=C3)O

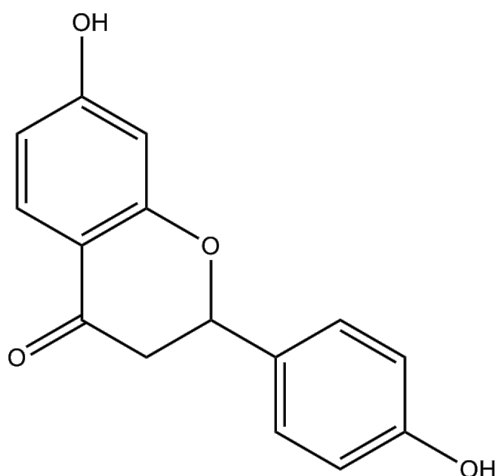
Formula $C_{15}H_{12}O_4$ M.Wt 256.25

Solubility DMF: 30 mg/ml, DMSO: 30 mg/ml, Ethanol: 25 mg/ml Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

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Cell lines Murine macrophage cell line Raw264.7

Preparation Method The murine macrophage cell line Raw264.7 was obtained and cells were grown to 80–90% confluence and subjected to no more than 20 passages. Cells were cultured in serum-free medium for 12 hours before the experiment. They were then pretreated with liquiritigenin (3, 10 and 30μM) for 1 hour and the cells were co-incubated with LPS.

Reaction
Conditions 3, 10 and 30μM; 1h

Applications LPS treatment alone significantly increased the levels of TNF-α, IL-1β, and IL-6 compared with the vehicle control group. Liquiritigenin dose-dependently inhibited the production of these three cytokines.

Animal experiment [1]:

Animal models 6-week-old male Sprague-Dawley (SD) rats

Preparation Method To assess whether liquiritigenin suppresses carrageenan-induced paw edema, 24 rats were randomly assigned to four groups of six each including a vehicle control, an oral liquiritigenin group (50mg/kg/day; 3 days; p.o.), an intravenous liquiritigenin group (15mg/kg/day; 2 days; i.v.), and a positive control. Acute paw edema was induced by subcutaneous injection of 1% carrageenan solution (0.1 mL per animal) into the right hind paw at 30 minutes after the last treatment. Paw volume was measured before carrageenan injection and at 1, 2, 3, and 4 hours post-injection using a plethysmometer. The swelling volume was calculated based on the pre-injection volume.

Dosage form 50mg/kg/day; 3 days; p.o.
15mg/kg/day; 2 days; i.v.

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Applications In a carrageenan-induced rat paw edema model, oral or intravenous administration of liquiritigenin significantly reduced paw swelling volume ($P < 0.01$), with efficacy comparable to the positive control dexamethasone.

References:

[1] Kim, Y.W., et al., Anti-inflammatory effects of liquiritigenin as a consequence of the inhibition of NF-kappaB-dependent iNOS and proinflammatory cytokines production. *Br J Pharmacol*, 2008. 154(1): p. 165-73.

Background

Liquiritigenin is a natural flavonoid compound derived from licorice (*Glycyrrhiza*) that selectively activates estrogen receptor β (ER β), with a half-maximal effective concentration (EC₅₀) of 36.5nM. Various biological activities of liquiritigenin, including anti-inflammatory [1, 2], antioxidant [3], anticancer [4], organ-protective [5], bone growth-promoting [6], anti-infection [7], and antithrombotic [8] effects have been validated in both cell and animal models. Liquiritigenin is primarily metabolized in the liver by CYP3A enzymes, with marked inter-individual differences [9].

In vitro, pre-incubation with liquiritigenin (3, 10 and 30 μ M) for 1 hour dose-dependently reduced the levels of the inflammatory cytokines TNF- α , IL-1 β , and IL-6 in LPS-stimulated Raw264.7 cells, with the most significant inhibition observed at 30 μ M [1]. HT22 cells were pretreated with liquiritigenin (10, 25 and 50 μ M) for 12h and then stimulated with glutamate. This treatment dose-dependently inhibited glutamate-induced ROS elevation, decreasing from 4.69-fold to 1.89-fold at 50 μ M. Liquiritigenin also slightly reduced lipid peroxidation levels (from 1.60-fold to 1.45-fold) at 50 μ M [3]. Treatment with liquiritigenin for 24 h significantly inhibited the viability of colorectal cancer cells (IC₅₀ of 13.70 μ M for SW480 and 15.28 μ M for DLD1) with low toxicity to normal colonic epithelial NCM460 cells (IC₅₀ = 111.41 μ M) [4].

In vivo, oral administration of liquiritigenin to male SD rats (50mg/kg/day for 3 days) or intravenous injection (15mg/kg/day for 2 days) significantly attenuated carrageenan-induced paw edema [1]. Pneumonia was induced in mice by lipopolysaccharide or *Staphylococcus aureus*. A mixture containing six components including liquiritigenin (12.4 μ g/mL), was administered at 0.3mL/day for 7

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consecutive days, which markedly reduced both mRNA and protein levels of iNOS in lung tissue and alleviated pulmonary inflammation [2]. A CCl₄-induced mouse model of liver fibrosis was established. Oral administration of liquiritigenin (10mg/kg/day for 4 weeks) significantly decreased hepatic hydroxyproline content and reduced collagen deposition. α -SMA expression was also suppressed, which alleviated liver fibrosis [5].

References:

- [1] Kim, Y.W., et al., Anti-inflammatory effects of liquiritigenin as a consequence of the inhibition of NF-kappaB-dependent iNOS and proinflammatory cytokines production. Br J Pharmacol, 2008. 154(1): p. 165-73.
- [2] Jiang, X., et al., Identification of potential anti-pneumonia pharmacological components of Glycyrrhizae Radix et Rhizoma after the treatment with Gan An He Ji oral liquid. J Pharm Anal, 2022. 12(6): p. 839-851.
- [3] Yang, E.J., G.H. Park, and K.S. Song, Neuroprotective effects of liquiritigenin isolated from licorice roots on glutamate-induced apoptosis in hippocampal neuronal cells. Neurotoxicology, 2013. 39: p. 114-23.
- [4] Li, R., et al., Liquiritigenin targets transferrin receptor to potentiate ferroptosis sensitivity in colorectal cancer cells. Phytomedicine, 2026. 154: p. 158057.
- [5] Geng, W., et al., Liquiritigenin suppresses the activation of hepatic stellate cells via targeting miR-181b/PTEN axis. Phytomedicine, 2020. 66: p. 153108.
- [6] Qiu, Y., et al., Liquiritigenin promotes osteogenic differentiation and prevents bone loss via inducing auto-lysosomal degradation and inhibiting apoptosis. Genes Dis, 2023. 10(1): p. 284-300.
- [7] Kumar, S., et al., Effect of liquiritigenin on chloroquine accumulation in digestive vacuole leading to apoptosis-like death of chloroquine-resistant P. falciparum. Phytomedicine, 2023. 114: p. 154738.
- [8] Cheng, L., et al., Liquiritigenin attenuates thrombosis by inhibiting P2Y(12)R-mediated Src/PLC γ 2 signaling and cytoplasmic Ca(2+) mobilization in platelets. Phytomedicine, 2025. 149: p. 157553.
- [9] Tsukamoto, S., et al., CYP3A4 inhibitors isolated from Licorice. Biol Pharm Bull, 2005. 28(10): p. 2000-2.

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