

Product Data Sheet

Product Name: Chicoric acid

Cat. No.: GC64993

Chemical Properties

Cas. No. 6537-80-0

Formula $C_{22}H_{18}O_{12}$

M.Wt 474.37

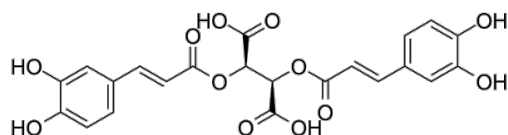
Solubility Water : 100 mg/mL (210.81 mM;
Need ultrasonic)|DMSO : 1 mg/mL
(2.11 mM; Need ultrasonic)

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



Caution: Product has not been fully validated for medical applications. For research use only.

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Protocol

Cell experiment [1]:

Cell lines Human umbilical vein endothelial cells (HUVECs)

Preparation Method Cells were pretreated with different doses of chicoric acid (25, 50, 100, 200 μ M) for 30min before exposure to high glucose/high fat (HGpHF) medium supplemented with glucose (25mM) and saturated free fatty acid palmitate (500 μ M) for 24h. The cells in the control group were incubated with an equal amount of palmitate-free BSA and glucose (5mM). The apoptosis of HUVECs was determined by terminal deoxynucleotidyl transferase-mediated dUTP nick end-labeling (TUNEL) assay.

Reaction
Conditions 25, 50, 100, 200 μ M; 30min

Applications Chicoric acid inhibited HG1HF-induced apoptosis in HUVECs.

Animal experiment [2]:

Animal models ICR mice

Preparation Method ICR mice were injected intraperitoneally with PBS or compound 48/80 (8mg/kg dissolved in PBS). Chicoric acid at doses of 20mg/kg, 1h before compound 48/80 was injected. Mortality was monitored for 1h after induction of anaphylactic shock, after which blood was collected from the heart of each rat to measure serum histamine content. The blood was clotted for 1h at room temperature and centrifuged for 20min at 3,000g at 4°C to obtain the serum.

Dosage form 20mg/kg; i.p.

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Applications Chicoric acid at a dose of 20mg/kg decreased the compound 48/80-induced serum histamine levels. The results of the mortality test correlated with the measured serum histamine levels.

References:

- [1] Ma X, Zhang J, Wu Z, et al. Chicoric acid attenuates hyperglycemia-induced endothelial dysfunction through AMPK-dependent inhibition of oxidative/nitrative stresses[J]. Journal of Receptors and Signal Transduction, 2021, 41(4): 378-392.
- [2] Lee N Y, Chung K S, Jin J S, et al. Effect of chicoric acid on mast cell-mediated allergic inflammation in vitro and in vivo[J]. Journal of natural products, 2015, 78(12): 2956-2962.

Background

Chicoric acid is a hydroxycinnamic acid, belonging to the phenylpropanoid class of organic compounds. Chicoric acid is found in various plants, including chicory, dandelion, and basil, and possesses multiple biological activities such as antioxidant, anti-inflammatory, anti-diabetic, and antiviral effects^[1, 2]. Chicoric acid can promote insulin release and glucose uptake^[3]. Chicoric acid can alleviate cognitive impairment caused by oxidative stress^[4].

In vitro, pretreatment of human umbilical vein endothelial cells (HUVECs) with Chicoric acid (25-200μM) for 30min inhibited apoptosis induced by high glucose/high fat (HG+HF) medium, and reduced HG+HF-induced IκBα phosphorylation and degradation, as well as subsequent p65 NFκB nuclear translocation^[5]. Treatment of 3T3-L1 preadipocytes with Chicoric acid (10-200μM) for 24-72h inhibited cell viability in a dose- and time-dependent manner, induced apoptosis, and reduced mitochondrial membrane potential (MMP)^[6].

In vivo, Chicoric acid (20mg/kg) administered via intraperitoneal injection to mice with compound 48/80-induced anaphylactic shock reduced serum histamine levels and mortality^[7].

References:

- [1] Duda Ł, Kłosiński K K, Budryn G, et al. Medicinal use of chicory (Cichorium intybus L.)[J]. Scientia Pharmaceutica, 2024, 92(2): 31.
- [2] Ferrare K, Bidel L P R, Awwad A, et al. Increase in insulin sensitivity by the association of chicoric acid and chlorogenic acid contained in a natural chicoric acid extract (NCRAE) of chicory (Cichorium

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- intybus L.) for an antidiabetic effect[J]. Journal of ethnopharmacology, 2018, 215: 241-248.
- [3] Tousch D, Lajoix A D, Hosy E, et al. Chicoric acid, a new compound able to enhance insulin release and glucose uptake[J]. Biochemical and biophysical research communications, 2008, 377(1): 131-135.
- [4] Wang Y, Diao Z, Li J, et al. Chicoric acid supplementation ameliorates cognitive impairment induced by oxidative stress via promotion of antioxidant defense system[J]. RSC advances, 2017, 7(57): 36149-36162.
- [5] Ma X, Zhang J, Wu Z, et al. Chicoric acid attenuates hyperglycemia-induced endothelial dysfunction through AMPK-dependent inhibition of oxidative/nitrative stresses[J]. Journal of Receptors and Signal Transduction, 2021, 41(4): 378-392.
- [6] Xiao H, Wang J, Yuan L, et al. Chicoric acid induces apoptosis in 3T3-L1 preadipocytes through ROS-mediated PI3K/Akt and MAPK signaling pathways[J]. Journal of agricultural and food chemistry, 2013, 61(7): 1509-1520.
- [7] Lee N Y, Chung K S, Jin J S, et al. Effect of chicoric acid on mast cell-mediated allergic inflammation in vitro and in vivo[J]. Journal of natural products, 2015, 78(12): 2956-2962.

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