

Product Data Sheet

Product Name: Naringenin chalcone

Cat. No.: GC38972

Chemical Properties

Cas. No. 73692-50-9

SMILES OC(C=C1)=CC=C1/C=C/C(C2=C(C=C(O)C=C2O)O)=O

Formula $C_{15}H_{12}O_5$ M.Wt 272.25

Solubility DMF: 15 mg/ml, DMSO: 10 mg/ml, Ethanol: 1 mg/ml, PBS (pH 7.2): slightly soluble
Storage 4°C, protect from light

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.

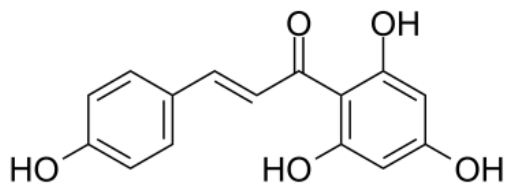
Caution: Product has not been fully validated for medical applications. For research use only.

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Structure



Protocol

Cell experiment [1]:

Cell lines 3T3-L1 cells

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3T3-L1 cells grew in Dulbecco's Modified Eagle Medium (DMEM) which included 10% fetal bovine serum (FBS). Cells began differentiation into adipocytes two days post-confluence when differentiation medium composed of DMEM with 10% FBS and 0.5mmol/L 3-isobutyl-1-methylxanthine along with 1µmol/L dexamethasone and 10µg/ml insulin was added together with specific Naringenin chalcone concentrations (25, 50, 100µmol/L) on day 0. On the second day, 3T3-L1 cells moved to adipocyte-growing medium (DMEM with

Preparation Method 10% FBS and 5µg/ml insulin) and received various Naringenin chalcone concentrations (25, 50, 100µmol/L), which was replenished every 48 hours. Use dimethyl sulfoxide to serve as the vehicle control for Naringenin chalcone at a 0.1% concentration. The culture medium was gathered on day 8 to measure adiponectin secretion during differentiation days 6 to 8 using enzyme-linked immunosorbent assay (ELISA). Extract total RNA for use in quantitative reverse transcription-polymerase chain reaction (RT-PCR) and DNA microarray analysis.

Reaction
Conditions 25, 50, 100µmol/L; 0-8 days

Applications Naringenin chalcone stimulated adiponectin gene expression and protein secretion in 3T3-L1 cells while simultaneously boosting genes involved in mitochondrial energy metabolism.

Animal experiment [2]:

Animal models BALB/c nude mice

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BALB/c nude mice received an intraperitoneal injection of 100µg of Ovalbumin (OVA) bound to 1mg of alum on day 0 followed by another dose on day 7. The mice received aerosolized OVA dissolved in saline at 10mg/mL concentration through inhalation for 30 minutes by means of a supersonic nebulizer on both day 21 and day 23. During the entire experimental period the mice received 0.8mg/kg of Naringenin chalcone through oral delivery using a 0.5% carboxymethyl cellulose sodium salt solution at a volume of 5mL/kg of body weight each day. Use a 0.5% carboxymethyl cellulose sodium salt solution lacking Naringenin chalcone as the placebo treatment. The metabolites of

Preparation Method Naringenin chalcone maintained a half-life of 5.5 ± 1.7 hours in rat blood while approximately 60% of the administered compound was absorbed. After 48 hours from the final OVA challenge the mice underwent asphyxiation before the lungs of mice received a 10% (v/v) formalin PBS buffer infusion to enable tissue fixation. The lung samples underwent sectioning and staining with either hematoxylin and eosin (H&E) reagents or periodic acid-Schiff (PAS) reagent before examination under a light microscope at $\times 100$ magnification to identify pathological changes. Determine the number of infiltrated mononuclear cells in the peribronchiolar regions through direct counting in four separate fields for each slide.

Dosage form 0.8mg/kg/day for 23 days; p.o.

Applications Naringenin chalcone significantly inhibited eosinophilic airway inflammation, airway hyperresponsiveness and Th2 cytokine production by CD4⁺ T cells in the experimental mouse model, resulting in a slight reduction in mucus overproduction.

References:

- [1] Horiba T, Nishimura I, Nakai Y, et al. Naringenin chalcone improves adipocyte functions by enhancing adiponectin production[J]. Molecular and Cellular Endocrinology, 2010, 323(2): 208-214.
- [2] Iwamura C, Shinoda K, Yoshimura M, et al. Naringenin chalcone suppresses allergic asthma by inhibiting the type-2 function of CD4 T cells[J]. Allergology International, 2010, 59(1): 67-73.

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Background

Naringenin chalcone functions as an anti-allergic compound that can be taken orally and has shown effectiveness in reducing human placental CYP19A1 activity with an IC₅₀ value of 2.6μmol/L^[1].

Naringenin chalcone is a flavonol biosynthesis intermediate that converts into Naringenin through spontaneous metabolism by chalcone isomerase and serves as a common research subject for anti-inflammatory studies^[2].

In vitro, Naringenin chalcone treatment (100μmol/L; 48h) significantly promoted the apoptosis of U87MG human glioblastoma cells, inhibited chromatin condensation, DNA fragmentation and membrane blistering of the cells, and upregulated the expression of all PI3K-related proteins^[3]. Naringenin chalcone inhibited the histamine release from rat peritoneal mast cells with IC₅₀ value of 68μg/ml for 24h^[4]. After treating 3T3-L1 cells with 100μmol/L Naringenin chalcone for 24h, the genes related to mitochondrial energy metabolism were upregulated and the metabolic function of the cells was improved^[5].

In vivo, Naringenin chalcone treatment (80mg/kg/day; p.o.) for 24 days significantly inhibited tumor weight and tumor volume in xenograft tumor model of nude mice^[3]. After oral administration of Naringenin chalcone (20mg/kg) to male Sprague-Dawley rats for 24 hours, the level of Naringenin chalcone 2'-O-β-D-glucuronide in the rat serum increased, inhibiting histamine release^[6]. Oral administration of Naringenin chalcone (0.8mg/kg/day) for 23 days can alleviate allergic respiratory tract inflammation in the experimental mouse model of allergic asthma^[7].

References:

- [1] Wang Y, Pan P, Li X, et al. Food components and environmental chemicals of inhibiting human placental aromatase[J]. Food and Chemical Toxicology, 2019, 128: 46-53.
- [2] Kolot C, Rodriguez-Mateos A, Feliciano R, et al. Bioavailability of naringenin chalcone in humans after ingestion of cherry tomatoes[J]. International Journal for Vitamin and Nutrition Research, 2019.
- [3] Zhang S, Jiang Z F, Pan Q, et al. Anti-cancer effect of naringenin chalcone is mediated via the induction of autophagy, apoptosis and activation of PI3K/Akt signalling pathway[J]. Bangladesh Journal of Pharmacology, 2016, 11(3): 684-690.
- [4] Yamamoto T, Yoshimura M, Yamaguchi F, et al. Anti-allergic activity of naringenin chalcone from a tomato skin extract[J]. Bioscience, biotechnology, and biochemistry, 2004, 68(8): 1706-1711.

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- [5] Escribano-Ferrer E, Queralt Regue J, Garcia-Sala X, et al. In vivo anti-inflammatory and antiallergic activity of pure naringenin, naringenin chalcone, and quercetin in mice[J]. Journal of natural products, 2019, 82(2): 177-182.
- [6] Yoshimura M, Sano A, Kamei J I, et al. Identification and quantification of metabolites of orally administered naringenin chalcone in rats[J]. Journal of agricultural and food chemistry, 2009, 57(14): 6432-6437.
- [7] Iwamura C, Shinoda K, Yoshimura M, et al. Naringenin chalcone suppresses allergic asthma by inhibiting the type-2 function of CD4 T cells[J]. Allergology International, 2010, 59(1): 67-73.

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