

Product Data Sheet

Product Name: Hesperidin

Cat. No.: GN10613

Chemical Properties

Cas. No. 520-26-3

Chemical Name (2S)-5-hydroxy-2-(3-hydroxy-4-methoxyphenyl)-7-[(2S,3R,4S,5S,6R)-3,4,5-trihydroxy-6-[[[(2R,3R,4R,5R,6S)-3,4,5-trihydroxy-6-methyloxan-2-yl]oxymethyl]oxan-2-yl]oxy-2,3-dihydrochromen-4-one

SMILES CC1C(C(C(C(O1)OCC2C(C(C(C(O2)OC3=CC(=C4C(=O)CC(OC4=C3)C5=CC(=C(C=C5)OC)O)O)O)O)O)O)O)O

Formula C₂₈H₃₄O₁₅

M.Wt 610.56

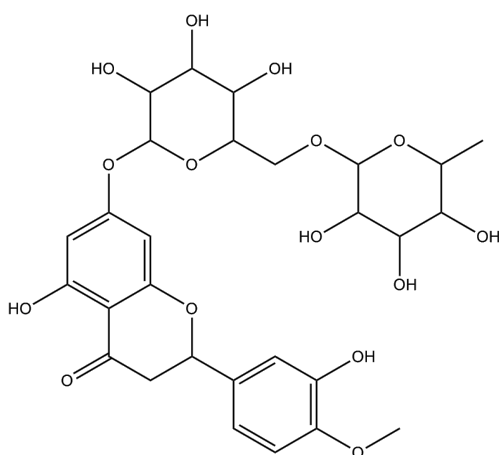
Solubility ≥ 72.67 mg/mL in DMSO with ultrasonic, <5.46 mg/mL in EtOH

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]:

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Cell lines MDA-MB231 cell

Preparation Method The human breast cancer cell line MDA-MB231 was cultured in the Dube modified Eagle's high glucose medium (DMEM-HG), supplemented with serum, 10% fetal bovine serum and antibiotics penicillin/streptomycin, and placed in a humidified incubator at 37°C with 5% CO₂. When the cell confluence reached 70% to 80%, the cells were used for the corresponding treatment or passage culture. The cytotoxicity of Hesperidin on MDA-MB231 cells was determined by the MTT method. The cells (5×10^3 cells/well) were inoculated in a 96-well culture plate, and treated with different concentrations of Hesperidin (50, 100, 150, 200μM) for 24, 48 or 72 hours. After incubation, 500μg/mL of MTT dye at the final concentration was added to the cells and incubated in a 37°C CO₂ incubator for 4 hours. After 4 hours of incubation, the supernatant was discarded, and the formed purple methylene blue crystals were dissolved in DMSO. The absorbance was measured at 540nm using a spectrophotometer, with a reference wavelength of 630nm. The cell viability calculation formula is: cell survival rate% = (sample OD value / control OD value) × 100. The data of each parameter are expressed as the mean ± standard deviation (SD). The experiment was conducted three independent experiments, with three replicates each time.

Reaction Conditions 50, 100, 150, 200μM; 24, 48 and 72h

Applications Hesperidin significantly inhibited the viability of MDA-MB231 cells in a time- and dose-dependent manner.

Animal experiment [2]:

Animal models Male BALB/c mice

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

The 6-week-old male BALB/c mice weighing 30 grams were anesthetized by intraperitoneal injection of a mixture of ketamine (80mg/kg) and xylazine (30mg/kg). LPS was intratracheally injected using a bent 27G curved tuberculosis syringe (volume 50μL). The neck incision was sutured with 5-0 silk thread, and the mice were returned to the cage. The mice were stimulated by intratracheal injection of LPS (100μg/kg) or treated orally with 200mg/kg

Preparation Method Hesperidin for 30 minutes before LPS treatment. The histological changes in the lungs of Hesperidin-treated mice and vehicle-treated mice under LPS induction were evaluated. At 24 hours after the surgery, the mice were sacrificed by bloodletting after anesthesia and the lung tissues were fixed with 4% paraformaldehyde. The wax-embedded lung tissues were cut into 3μm thick sections, stained with hematoxylin and eosin, and subjected to morphological analysis.

Dosage form 200mg/kg for 30min; p.o.

Applications Hesperidin treatment significantly mitigated morphologic damage in lungs of mice exposed to LPS.

References:

- [1] Kongtawelert P, Wudtiwai B, Shwe T H, et al. Inhibitory effect of hesperidin on the expression of programmed death ligand (PD-L1) in breast cancer[J]. *Molecules*, 2020, 25(2): 252.
- [2] Yeh C C, Kao S J, Lin C C, et al. The immunomodulation of endotoxin-induced acute lung injury by hesperidin in vivo and in vitro[J]. *Life sciences*, 2007, 80(20): 1821-1831.

Background

Hesperidin, a flavonoid from the peel of navel orange, inhibits lipid peroxidation with an IC₅₀ value of 179.1μM^[1]. Hesperidin possesses strong antioxidant, anti-inflammatory and neuroprotective properties and has been widely used in anti-cancer researches^[2-3].

In vitro, Hesperidin treatment for 24h exhibited strong cytotoxic effects on the Caco-2, CEM/ADR5000 and CCRF-CEM cancer cell lines, with IC₅₀ values of 195, 230 and 95μM, respectively^[4].

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Pretreatment of RAW 264.7 cells with 50μM Hesperidin for 24 hours significantly inhibited the production of NO and PGE2 induced by lipopolysaccharide (LPS) treatment (1μg/mL; 24h), and reduced the levels of pro-inflammatory cytokines (such as TNF-α and IL-6)^[5]. Hesperidin treatment (80μM; 24h) significantly increased the expression of PinX1 protein, and inhibited cell proliferation and invasion of Lewis lung carcinoma (LLC) cells, without affecting the viability of normal lung cells^[6].

In vivo, Hesperidin treatment at dose of 25mg/kg (1h; p.o.) prevented mechanical ventilation-induced lung damage and improved antioxidant defense in C57BL/6 mice^[7]. Oral administration of 100mg/kg/day of Hesperidin to male C57BL/6 mice for seven consecutive days promoted the transport and excretion of bile acids from the liver to the feces, thereby alleviating bile stasis in the mice^[8].

References:

- [1] Cho J. Antioxidant and neuroprotective effects of hesperidin and its aglycone hesperetin[J]. Archives of pharmacal research, 2006, 29(8): 699-706.
- [2] Hajialyani M, Hosein Farzaei M, Echeverría J, et al. Hesperidin as a neuroprotective agent: a review of animal and clinical evidence[J]. Molecules, 2019, 24(3): 648.
- [3] Rahmani A H, Babiker A Y, Anwar S. Hesperidin, a bioflavonoid in cancer therapy: a review for a mechanism of action through the modulation of cell signaling pathways[J]. Molecules, 2023, 28(13): 5152.
- [4] El-Readi M Z, Hamdan D, Farrag N, et al. Inhibition of P-glycoprotein activity by limonin and other secondary metabolites from Citrus species in human colon and leukaemia cell lines[J]. European Journal of Pharmacology, 2010, 626(2-3): 139-145.
- [5] Choi S S, Lee S H, Lee K A. A comparative study of hesperetin, hesperidin and hesperidin glucoside: antioxidant, anti-inflammatory, and antibacterial activities in vitro[J]. Antioxidants, 2022, 11(8): 1618.
- [6] Yao Y, Lin M, Liu Z, et al. Hesperidin inhibits lung cancer in vitro and in vivo through PinX1[J]. Frontiers in pharmacology, 2022, 13: 918665.
- [7] de Souza A B F, de Matos N A, de Freitas Castro T, et al. Effects in vitro and in vivo of hesperidin administration in an experimental model of acute lung inflammation[J]. Free Radical Biology and Medicine, 2022, 180: 253-262.
- [8] Zhang G, Sun X, Wen Y, et al. Hesperidin alleviates cholestasis via activation of the farnesoid X

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

receptor in vitro and in vivo[J]. European journal of pharmacology, 2020, 885: 173498.

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA