

Product Data Sheet

Product Name: α -Humulene

Cat. No.: GC40262

Chemical Properties

Cas. No. 6753-98-6

SMILES C/C1=C\CC/C(C)=C/CC(C)(C)/C=C/C1

Formula C₁₅H₂₄

M.Wt 204.4

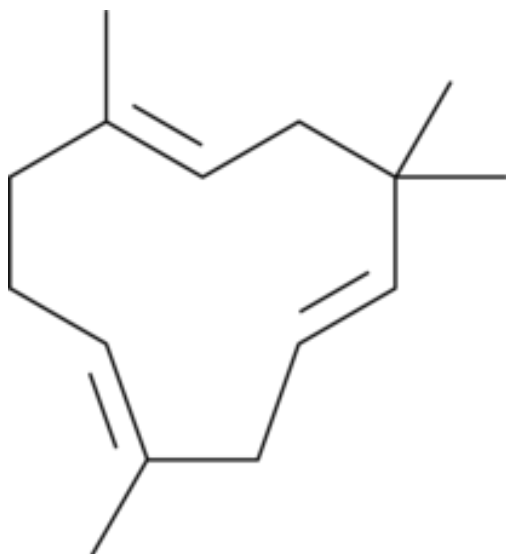
Solubility Methanol: 10 mg/ml

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	Huh7 cells
Preparation Method	Huh7 cells were cultured in DMEM medium, supplemented with 10% fetal bovine serum (FBS), 100U/ml penicillin, and 100µg/ml streptomycin, at 37°C in an incubator with 5% CO ₂ . Cells (1×10^4 /well) were seeded in 96-well plates, allowed to adhere overnight, and treated for 24h at 37°C with different concentrations of α-Humulene (0, 1, 5, 10, 50, 100, and 200µg/ml), the cell proliferation was tested.
Reaction Conditions	0, 1, 5, 10, 50, 100, and 200µg/ml; 24h
Applications	α-Humulene treatment reduced cell proliferation of Huh7 cells in a dose-dependent manner.
Animal experiment [2]:	
Animal models	Female BALB/c mice

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Preparation Method	Female BALB/c mice (8 weeks old; 20-25g) were kept in controlled room temperature (22±2°C) and humidity (60-80%) under a 12:12h light-dark cycle (lights on 06:00). Mice were immunized on days 0 and 7 by subcutaneous injection of 4µg of ovalbumin plus 1.6mg of aluminium hydroxide in 0.4ml of saline followed by two intranasal challenges (on post-immunization days 14 and 21) with 10µg of ovalbumin in 50µl of saline, delivered into the nostrils under light ether anaesthesia with the aid of a micropipette. To study the preventive anti-inflammatory effects, α-humulene or trans-caryophyllene were given orally by gavage at a dose of 50mg/kg for 22 days, starting from the day of immunization. Mice were killed by isoflurane overdose. Subsequently, a polyethylene cannula was introduced into the trachea, and phosphate-buffered saline (PBS) containing heparin (10UI/ml) was instilled in three aliquots (0.3, 0.3, and 0.4ml) to a total of 1ml. The bronchoalveolar lavage fluid (BALF) was recovered and placed on ice for analysis.
Dosage form	50mg/kg/day; 22 days; p.o.
Applications	α-Humulene treatment reduced the eosinophil recruitment to the BALF in mice with allergic airway inflammation.
References:[1] Chen H, Yuan J, Hao J, et al. α-Humulene inhibits hepatocellular carcinoma cell proliferation and induces apoptosis through the inhibition of Akt signaling[J]. Food and Chemical Toxicology, 2019, 134: 110830.[2] Rogerio A P, Andrade E L, Leite D F P, et al. Preventive and therapeutic anti-inflammatory properties of the sesquiterpene α-humulene in experimental airways allergic inflammation[J]. British journal of pharmacology, 2009, 158(4): 1074-1087.	

Background

α-Humulene is a sesquiterpene found in essential oils of various plant species with an IC₅₀ value of 15µg/ml for anti-inflammatory activities^[1]. α-Humulene strongly inhibits the expression of multidrug efflux pump genes (bmeB1 and bmeB3), prevents the formation of bacterial biofilms, restrains

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bacterial metabolic activity, and hinders bacterial growth^[2]. α -Humulene exerts anti-inflammatory effects by regulating intracellular calcium ion and cAMP levels, thereby reducing the expression level of IL-6 mRNA and histamine levels^[3]. α -Humulene has been widely used in anti-proliferation studies to kill various cancer cells and regulate oxidative stress^[4].

In vitro, α -Humulene treatment for 12 hours significantly inhibited the viability of Huh7, SMMC-7721, HepG2, and Hep3B cells, with IC₅₀ values of 15.09 μ g/ml, 17.31 μ g/ml, 11.22 μ g/ml, and 13.78 μ g/ml, respectively^[5]. Incubation with 200 μ M α -Humulene for 4 hours induced an increase in reactive oxygen species (ROS) in L-929 cells and a decrease in intracellular glutathione (GSH) content^[6].

In vivo, Single intragastric administration of α -Humulene at a dose of 100mg/kg 30 minutes before HCl/ethanol injection alleviated HCl/ethanol-induced gastric mucosal injury and increased the levels of mucus-stabilizing factors in rats^[7]. Daily oral administration of α -Humulene at a dose of 50mg/kg for 22 consecutive days reduced eosinophil counts and decreased the expression of inflammatory mediators and adhesion molecules as well as transcription factor activation in a mouse model of allergic airway inflammation^[8].

References:

- [1] Coté H, Boucher M A, Pichette A, et al. Anti-inflammatory, antioxidant, antibiotic, and cytotoxic activities of *Tanacetum vulgare* L. essential oil and its constituents[J]. *Medicines*, 2017, 4(2): 34.
- [2] Jang H I, Rhee K J, Eom Y B. Antibacterial and antibiofilm effects of α -humulene against *Bacteroides fragilis*[J]. *Canadian Journal of Microbiology*, 2020, 66(6): 389-399.
- [3] Becker L, Holtmann D. Anti-inflammatory effects of α -humulene on the release of pro-inflammatory cytokines in lipopolysaccharide-induced THP-1 cells[J]. *Cell Biochemistry and Biophysics*, 2024, 82(2): 839-847.
- [4] Dalavaye N, Nicholas M, Pillai M, et al. The clinical translation of α -humulene—A scoping review[J]. *Planta medica*, 2024, 90(09): 664-674.
- [5] Chen H, Yuan J, Hao J, et al. α -Humulene inhibits hepatocellular carcinoma cell proliferation and induces apoptosis through the inhibition of Akt signaling[J]. *Food and Chemical Toxicology*, 2019, 134: 110830.
- [6] Legault J, Dahl W, Debiton E, et al. Antitumor activity of balsam fir oil: Production of reactive oxygen species induced by α -humulene as possible mechanism of action[J]. *Planta medica*, 2003, 69(05): 402-407.

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[7] Yeo D, Hwang S J, Song Y S, et al. Humulene inhibits acute gastric mucosal injury by enhancing mucosal integrity[J]. Antioxidants, 2021, 10(5): 761.

[8] Rogerio A P, Andrade E L, Leite D F P, et al. Preventive and therapeutic anti-inflammatory properties of the sesquiterpene α -humulene in experimental airways allergic inflammation[J]. British journal of pharmacology, 2009, 158(4): 1074-1087.

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