

Product Data Sheet

Product Name: Farnesol
Cat. No.: GC32387

Chemical Properties

Cas. No. 4602-84-0

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

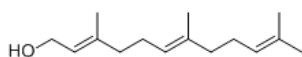
Formula $C_{15}H_{26}O$ M.Wt 222.37

Solubility DMF: 20 mg/ml, DMSO: 10 mg/ml, Ethanol: 30 mg/ml, Ethanol: PBS (pH 7.2) (1:3): 0.25 mg/ml
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.

Structure



Protocol

Cell experiment [1]:

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Cell lines Caco-2 cells

The growth and maintenance of Caco-2 cells were carried out in a modified Dubecco Eagle medium (DMEM) containing 10% FBS and 1% antibiotics, and the cells were cultured at 37°C, 5% CO₂ and humidity conditions. Adjust the cell

Preparation Method concentration to 5×10^4 cells/ml, and inoculate it in 96-well plates at a volume of 100µl/well. Treat the cells with different concentrations of Farnesol (0.01, 0.025, 0.05, 0.1, 0.5, 1, 2, 5, and 10mM) for 24 hours, and then analyze the cell viability.

Reaction Conditions 0.01, 0.025, 0.05, 0.1, 0.5, 1, 2, 5, and 10mM; 24h

Applications Farnesol treatment inhibited the cell viability of Caco-2 cells in a dose-dependent manner.

Animal experiment [2]:

Animal models Male nude mice

Five-week-old male nude mice weighing 20-30 grams were raised in a standard sterile environment with a temperature of $23 \pm 5^\circ\text{C}$ and a relative humidity of

Preparation Method $40 \pm 10\%$. A density of 5×10^6 cells/ml of DU145 cells were injected subcutaneously into the lateral abdomen of the nude mice. All mice received oral treatment starting from the day of tumor implantation and continued for 5 weeks. The control group mice were orally administered 0.2ml of corn oil daily for 5 weeks. The treatment group mice were orally administered 50mg/kg of Farnesol daily for 5 weeks, and the tumor growth was analyzed.

Dosage form 50mg/kg/day for 5 weeks; p.o.

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Applications Farnesol treatment significantly decreased the tumor volume in the DU145 cell-xenograft mouse models.

References:

- [1] Yilmaz Öztürk B, Feyzullazade N, Dağ İ, et al. The investigation of in vitro effects of farnesol at different cancer cell lines[J]. Microscopy Research and Technique, 2022, 85(8): 2760-2775.
- [2] Park J S, Kwon J K, Kim H R, et al. Farnesol induces apoptosis of DU145 prostate cancer cells through the PI3K/Akt and MAPK pathways[J]. International journal of molecular medicine, 2014, 33(5): 1169-1176.

Background

Farnesol, a C15 terpene alcohol that is ubiquitous in nature, is a component of plant essential oils and is a quorum sensing molecule in *Candida albicans* [1]. Farnesol exerts the pro-inflammatory effect by increasing the levels of IL-6, TNF- α , and COX-2 in macrophage cells [2]. Farnesol has been widely used in various cell models and animal models to inhibit tumor growth [3].

In vitro, Farnesol treatment for 24 hours significantly inhibited the viability of A549 cells and Caco-2 cells, with IC₅₀ values of 4.6mM and 3.9mM, respectively [4]. Treatment with 20 μ M Farnesol for 48 hours significantly inhibited the growth of MCF-7 cells, induced the expression of THR β 1 mRNA and protein, and prevented the binding of THR β 1 to DNA [5]. Treatment of H460 cells with 250 μ M Farnesol for 24 hours induced endoplasmic reticulum stress and unfolded protein response, promoted cell apoptosis, accompanied by the activation of MEK1/2 [6].

In vivo, Farnesol treatment via oral administration at a dose of 100mg/kg/day for 5 weeks restored the cytokine secretion capacity of peritoneal macrophages in asthmatic mice, and reduced the levels of IL-6, TNF- α and inducible nitric oxide synthase (iNOS) [7]. Oral administration of 50mg/kg Farnesol daily for 5 weeks significantly reduced tumor growth in a prostate cancer mouse model [8].

References:

- [1] Chandran S S, Kealey J T, Reeves C D. Microbial production of isoprenoids[J]. Process biochemistry, 2011, 46(9): 1703-1710.

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- [2] Ghosh S, Howe N, Volk K, et al. Candida albicans cell wall components and farnesol stimulate the expression of both inflammatory and regulatory cytokines in the murine RAW264. 7 macrophage cell line[J]. FEMS Immunology & Medical Microbiology, 2010, 60(1): 63-73.
- [3] Jung Y Y, Hwang S T, Sethi G, et al. Potential anti-inflammatory and anti-cancer properties of farnesol[J]. Molecules, 2018, 23(11): 2827.
- [4] Yilmaz Öztürk B, Feyzullazade N, Dağ İ, et al. The investigation of in vitro effects of farnesol at different cancer cell lines[J]. Microscopy Research and Technique, 2022, 85(8): 2760-2775.
- [5] Duncan R E, Archer M C. Farnesol induces thyroid hormone receptor (THR) β 1 but inhibits THR-mediated signaling in MCF-7 human breast cancer cells[J]. Biochemical and biophysical research communications, 2006, 343(1): 239-243.
- [6] Joo J H, Liao G, Collins J B, et al. Farnesol-induced apoptosis in human lung carcinoma cells is coupled to the endoplasmic reticulum stress response[J]. Cancer research, 2007, 67(16): 7929-7936.
- [7] Ku C M, Lin J Y. Farnesol, a sesquiterpene alcohol in herbal plants, exerts anti-inflammatory and antiallergic effects on ovalbumin-sensitized and-challenged asthmatic mice[J]. Evidence-Based Complementary and Alternative Medicine, 2015, 2015(1): 387357.
- [8] Park J S, Kwon J K, Kim H R, et al. Farnesol induces apoptosis of DU145 prostate cancer cells through the PI3K/Akt and MAPK pathways[J]. International journal of molecular medicine, 2014, 33(5): 1169-1176.

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