

Product Data Sheet

Product Name: Hinokitiol
Cat. No.: GC11302

Chemical Properties

Cas. No. 499-44-5

Chemical Name 2-hydroxy-4-isopropylcyclohepta-2,4,6-trienone

SMILES OC1=CC(C(C)C)=CC=CC1=O

Formula $C_{10}H_{12}O_2$

M.Wt 164.2

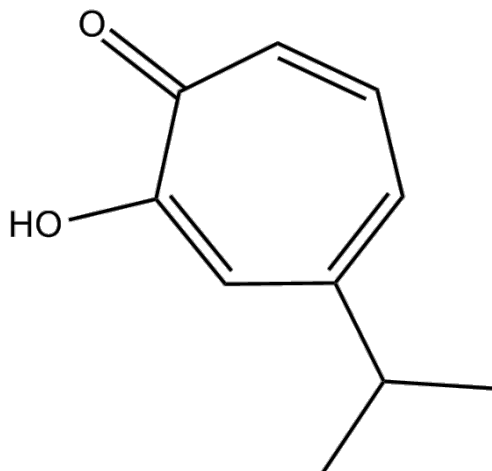
Solubility $\geq 16.4\text{mg/mL}$ in DMSO

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]:

Cell lines KLE cells

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

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Preparation Method KLE cells were seeded in 96-well plates at a density of 3×10^3 cells in DMEM/Ham's F-12 with 10% (v/v) fetal bovine serum (FBS), 100U/ml penicillin, and 100µg/ml streptomycin in a humidified atmosphere containing 5% CO₂ for 24h. After 48h of treatment with different concentrations of Hinokitiol (1, 5, 10, 25, and 50µM), the cell viability was measured.

Reaction Conditions 1, 5, 10, 25, and 50µM; 48h

Applications Hinokitiol treatment significantly inhibited the cell viability of KLE cells in a dose-dependent manner.

Animal experiment [2]:

Animal models Male BALB/c-nude mice

Preparation Method Male BALB/c-nude mice (6 weeks old; 22-25g) were housed in a room with controlled temperature (21-23°C), humidity (55-60%), and lighting (12h light/dark cycle) and were supplied with water. After being acclimated for 1 week, nude mice were randomly distributed in 3 groups: normal (n=10), HCT-116 xenograft (n=10), HCT-116 xenograft-Hinokitiol treatment (n=10). The mice were inoculated with HCT-116 cells by intradermal injection (2×10^6 tumor cells in 0.2ml of PBS/mouse) with a 26-gauge needle into the flank. After 2 days, mice were orally administered Hinokitiol (100mg/kg; every other day for 3 weeks). Tumor volumes were periodically measured.

Dosage form 100mg/kg; every other day for 3 weeks; p.o.

Applications Hinokitiol treatment significantly decreased the tumor volumes in mice with HCT-116 xenografts.

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References:

- [1] Chen H Y, Cheng W P, Chiang Y F, et al. Hinokitiol exhibits antitumor properties through induction of ROS-mediated apoptosis and p53-driven cell-cycle arrest in endometrial cancer cell lines (Ishikawa, HEC-1A, KLE)[J]. International journal of molecular sciences, 2021, 22(15): 8268.
- [2] Lee Y S, Choi K M, Kim W, et al. Hinokitiol inhibits cell growth through induction of S-phase arrest and apoptosis in human colon cancer cells and suppresses tumor growth in a mouse xenograft experiment[J]. Journal of natural products, 2013, 76(12): 2195-2202.

Background

Hinokitiol is a naturally occurring tropolone compound from the *Formosan cypress* with antibacterial and anticancer properties [1]. Hinokitiol induces oxidative stress, cytotoxicity, and autophagy through modulation of PI3K/Akt/mTOR, p38/ERK/MAPK, nuclear factor kappa B, and c-Jun N-terminal kinase signaling pathways [2]. Hinokitiol has been widely used to inhibit the metabolic processes of bacterial cell membranes, regulate respiration and membrane permeability, thereby effectively killing various bacteria[3].

In vitro, Hinokitiol treatment for 48 hours significantly reduced the cell viability of Ishikawa cells, HEC-1A cells, and KLE cells, with IC₅₀ values of 13.33μM, 49.51μM, and 4.69μM, respectively [4]. Treatment with 30μg/ml Hinokitiol for 24 hours led to the loss of cell membrane integrity and cell cycle arrest in KB-1 cells[5]. Treatment with 40μM Hinokitiol for 24 hours blocked the process of HeLa cells transitioning from the G2/M phase to the G1 phase, increased the expression levels of p21 and p53, promoted cytoplasmic expansion and enhanced SA-β-gal activity, and induced cell senescence[6].

In vivo, Hinokitiol treatment via oral administration at a dose of 100mg/kg every other day for 3 weeks significantly reduced tumor volume and tumor weight in the HCT-116 xenograft mouse model[7]. A single intravenous injection of 1.7mg/kg dose of Hinokitiol can alleviate liver injury induced by hemorrhagic shock/resuscitation in mice within 24 hours[8].

References:

- [1] El Hachlafi N, Lakhdar F, Khouchlaa A, et al. Health benefits and pharmacological properties of

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hinokitiol[J]. Processes, 2021, 9(9): 1680.

[2] Bhuia M S, Chowdhury R, Afroz M, et al. Therapeutic efficacy studies on the Monoterpenoid Hinokitiol in the treatment of different types of cancer[J]. Chemistry & biodiversity, 2025, 22(5): e202401904.

[3] Morita Y, Sakagami Y, Okabe T, et al. The mechanism of the bactericidal activity of hinokitiol[J]. Biocontrol Science, 2007, 12(3): 101-110.

[4] Chen H Y, Cheng W P, Chiang Y F, et al. Hinokitiol exhibits antitumor properties through induction of ROS-mediated apoptosis and p53-driven cell-cycle arrest in endometrial cancer cell lines (Ishikawa, HEC-1A, KLE)[J]. International journal of molecular sciences, 2021, 22(15): 8268.

[5] Roy A, Cheriyan B V, Perumal E, et al. Effect of hinokitiol in ameliorating oral cancer: in vitro and in silico evidences[J]. Odontology, 2025, 113(2): 750-763.

[6] Wang C C, Chen B K, Chen P H, et al. Hinokitiol induces cell death and inhibits epidermal growth factor-induced cell migration and signaling pathways in human cervical adenocarcinoma[J]. Taiwanese Journal of Obstetrics and Gynecology, 2020, 59(5): 698-705.

[7] Lee Y S, Choi K M, Kim W, et al. Hinokitiol inhibits cell growth through induction of S-phase arrest and apoptosis in human colon cancer cells and suppresses tumor growth in a mouse xenograft experiment[J]. Journal of natural products, 2013, 76(12): 2195-2202.

[8] Lu W J, Lin K H, Tseng M F, et al. New therapeutic strategy of hinokitiol in haemorrhagic shock-induced liver injury[J]. Journal of Cellular and Molecular Medicine, 2019, 23(3): 1723-1734.

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