

Product Data Sheet

Product Name: Echinatin

Cat. No.: GC38226

Chemical Properties

Cas. No. 34221-41-5

SMILES O=C(C1=CC=C(O)C=C1)/C=C/C2=CC=C(O)C=C2OC

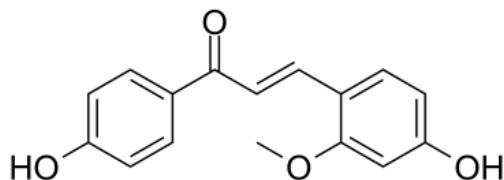
Formula $C_{16}H_{14}O_4$ M.Wt 270.28

Solubility DMSO: 250 mg/mL (924.97 mM) 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]:

Cell lines HepG2 cells

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

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HepG2 cells were cultured in DMEM medium containing 10% fetal bovine serum (FBS) and placed in an incubator at 37°C with 5% CO₂ saturation.

2.5×10³ HepG2 cells were seeded in 96-well plates and allowed to adhere completely before subsequent operations. Cells were treated with Echinatin (0, 10, 15, 20, and 25μM) in different concentration gradients. After waiting for 24 hours, 10μl of predissolved MTT solution (5mg/ml) was added to the wells and the incubation was continued for another 4 hours. Subsequently, 100μl of DMSO solution was added after the liquid in the wells was completely aspirated. Finally, the absorbance value at the wavelength of 492nm was recorded.

Reaction Conditions 0, 10, 15, 20, and 25μM; 24h

Applications Echinatin treatment significantly inhibited the cell viability of HepG2 cells in a dose-dependent manner.

Animal experiment [2]:

Animal models Female BALB/c nude mice

BALB/c nude mice (female, 4 weeks of age) were maintained under SPF grade conditions. After acclimatization to the experimental environment for 1 week, the mice were subcutaneously injected with 80μl sterile PBS solution containing 143B osteosarcoma cells suspension (cell density of 2×10⁶ cells/mL). Ten mice were randomly divided into two groups (n=5 in each group) and treated with Echinatin (60mg/kg) or 0.5% carboxymethylcellulose sodium (CMC-Na) by gavage once every two days. Body weight and tumor volume were recorded, and after 2 weeks, all mice were sacrificed by cervical dislocation. Finally, tumor samples were collected for analysis.

Dosage form 60mg/kg; every two days for 2 weeks; p.o.

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Applications Echinatin inhibited the growth of xenograft tumors in mice, decreased the expression levels of PCNA, Bcl-2, vimentin, MMP2, Snail and β -catenin, and increased the expression levels of p-p38 and GSK3 β .

References:

- [1] Wang J, Li Z, Han X, et al. Echinatin inhibits the growth and metastasis of human hepatocellular carcinoma cells through p38 and JNK signaling pathways[J]. Tissue and Cell, 2025, 95: 102907.
- [2] Lu Q, Huang H, Wang X, et al. Echinatin inhibits the growth and metastasis of human osteosarcoma cells through Wnt/ β -catenin and p38 signaling pathways[J]. Pharmacological Research, 2023, 191: 106760.

Background

Echinatin is the chalcone in the Chinese herbal medicine Gancao, with anti-inflammatory effects and antioxidant properties^[1]. Echinatin binds to heat shock protein 90 (HSP90), inhibits the ATPase activity, and disrupts the interaction between cochaperone SGT1 and HSP90-NLRP3^[2]. Echinatin has been widely used in animal models of ischemia/reperfusion to improve cardiac function^[3].

In vitro, Echinatin treatment for 24 hours significantly inhibited the viability of HepG2 and Huh-7 cells with IC₅₀ values of 23.48 μ M and 23.08 μ M, respectively^[4]. Echinatin treatment at 20 μ M for 48 hours significantly promoted KYSE30 cell apoptosis and inhibited AKT/mTOR signaling pathway^[5]. Echinatin treatment at 30 μ M for 24h inhibited lipopolysaccharide (LPS)-induced inflammatory response and downregulated the mRNA expression and release of IL-1 β and IL-6 in RAW264.7 cells^[6].

In vivo, Echinatin treatment (60mg/kg; every two days; p.o.) for 2 weeks inhibited the growth of 143B cell-xenograft tumors in mice, decreased the expression levels of PCNA, Bcl-2, vimentin, MMP2, Snail, and β -catenin, and increased the expression levels of p-p38 and GSK3 β ^[7]. Oral Echinatin at a dose of 25mg/kg/day for 45 consecutive days improved lipid levels and alleviated pancreatic and renal impairment in a diabetic rat model^[8].

References:

- [1] Liang M, Li X, Ouyang X, et al. Antioxidant mechanisms of echinatin and licochalcone A[J].

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[2] Xu G, Fu S, Zhan X, et al. Echinatin effectively protects against NLRP3 inflammasome-driven diseases by targeting HSP90[J]. JCI insight, 2021, 6(2): e134601.

[3] Tian X, Liu C, Jiang H L, et al. Cardioprotection provided by Echinatin against ischemia/reperfusion in isolated rat hearts[J]. BMC cardiovascular disorders, 2016, 16(1): 119.

[4] Wang J, Li Z, Han X, et al. Echinatin inhibits the growth and metastasis of human hepatocellular carcinoma cells through p38 and JNK signaling pathways[J]. Tissue and Cell, 2025, 95: 102907.

[5] Hong P, Liu Q W, Xie Y, et al. Echinatin suppresses esophageal cancer tumor growth and invasion through inducing AKT/mTOR-dependent autophagy and apoptosis[J]. Cell Death & Disease, 2020, 11(7): 524.

[6] Luo L, Wang H, Xiong J, et al. Echinatin attenuates acute lung injury and inflammatory responses via TAK1-MAPK/NF- κ B and Keap1-Nrf2-HO-1 signaling pathways in macrophages[J]. Plos one, 2024, 19(5): e0303556.

[7] Lu Q, Huang H, Wang X, et al. Echinatin inhibits the growth and metastasis of human osteosarcoma cells through Wnt/ β -catenin and p38 signaling pathways[J]. Pharmacological Research, 2023, 191: 106760.

[8] Li X, Lu P, Wan H, et al. Echinatin ameliorates hyperglycemia and associated pathogenesis, oxidative stress and inflammation in STZ-induced diabetes in rats[J]. Biochemical and Biophysical Research Communications, 2025: 152174.

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