

Product Data Sheet

Product Name: Alphitolic acid

Cat. No.: GC71997

Chemical Properties

Cas. No. 19533-92-7

Formula $C_{30}H_{48}O_4$

M.Wt 472.7

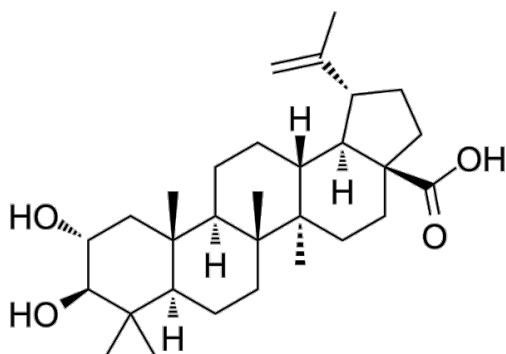
Solubility DMSO : 50 mg/mL (105.78 mM);
Need ultrasonic; Hygroscopic DMSO
has a significant impact on the
solubility of product, please use
newly opened DMSO)

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 SCC4 cells

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

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SCC4 cells were cultured in DMEM/F12 medium supplemented with 10% foetal bovine serum (FBS), 5mg/ml of penicillin, and 5mg/ml of streptomycin at 37°C in the presence of 5% CO₂. Cells (5×10^3) were seeded and incubated in 96-well, Preparation Method flat-bottomed plates in 10% FBS-supplemented DMEM/F12 for 24h, and were exposed to Alphitolic acid at the different concentrations (0, 10, 15, 20, 25, and 30μM) in 5% DMEM/F12 medium for 72h. Subsequently, cell viability analysis was conducted.

Reaction Conditions 0, 10, 15, 20, 25, and 30μM; 72h

Applications Alphitolic acid treatment induced cell apoptosis in SCC4 cells in a dose-dependent manner.

Animal experiment [2]:

Animal models Balb/C mice

Adult male CF-1 mice (20-25g) were kept on a 14:10h light-dark cycle, with water and food provided ad libitum, and were fasted overnight before the experiments. Alphitolic acid (1.56mg/ear) was dissolved in acetone and applied Preparation Method topically on the inner (10μl) and outer (10μl) surface of the right ear of the mice. After 5 min, 5μg TPA was administered topically on the right ear and acetone on the left ear as a solvent control. After 4.5h, all the mice were sacrificed by cervical dislocation, and a section of 6mm diameter of the right and left ears was collected for analysis.

Dosage form 1.56mg/ear for once; topical application

Applications Alphitolic acid treatment inhibited TPA-induced topical inflammation in the ears of mice.

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- [1] Bai L Y, Chiu C F, Chiu S J, et al. Alphitolic acid, an anti-inflammatory triterpene, induces apoptosis and autophagy in oral squamous cell carcinoma cells, in part, through a p53-dependent pathway[J]. Journal of Functional Foods, 2015, 18: 368-378.
- [2] Aguirre M C, Delporte C, Backhouse N, et al. Topical anti-inflammatory activity of 2 α -hydroxy pentacyclic triterpene acids from the leaves of Ugni molinae[J]. Bioorganic & medicinal chemistry, 2006, 14(16): 5673-5677.

Background

Alphitolic acid, a pentacyclic triterpenoid with a lupane skeleton, exhibits anti-inflammatory and cytotoxic activities [1]. Alphitolic acid can regulate various metabolism-related genes such as AR and FABP1, altering the metabolic state of cancer cells and thereby inhibiting cell growth[2]. Alphitolic acid can be used as a model compound to develop liquid chromatography methods for identifying related compounds and to screen therapeutic targets for type 2 diabetes in the pharmacodynamics experiments[3].

In vitro, Alphitolic acid treatment for 72 hours significantly inhibited the proliferation of SCC4 cells and SCC2095 cells, with IC₅₀ values of 12 μ M and 15 μ M, respectively [4]. Alphitolic acid pretreatment (22.7 μ M) for 1 hour significantly inhibited the production of NO and TNF- α in RAW 264.7 macrophages induced by Lipopolysaccharides (LPS)+IFN- γ [5]. 100 μ M of Alphitolic acid pretreatment for 1 hour significantly inhibited the expression of inducible nitric oxide synthase (iNOS) in J774A.1 cells stimulated by LPS, and reduced the level of NO[6].

In vivo, Alphitolic acid treatment (1.56mg/ear) via topical administration for 5min inhibited 12-O-tetradecanoylphorbol 13 acetate (TPA)-induced topical inflammation in the ears of adult male CF-1 mice [7].

References:

- [1] Park S, Cho J, Jeon H, et al. Expedient synthesis of alphitolic acid and its naturally occurring 2-O-ester derivatives[J]. Journal of Natural Products, 2019, 82(4): 895-902.
- [2] Wang X, Wan X, Zhu T, et al. Metabolomics combined with network pharmacology reveals the

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anti-hepatoma effects of terpenoids from *Polygonatum kingianum* var. *grandifolium* and *Polygonatum sibiricum* Redouté as well as differences in their terpenoid metabolites[J]. *BMC Plant Biology*, 2025, 25(1): 769.

[3] Shen C, Wang Y, Zhang H, et al. Exploring the active components and potential mechanisms of *Rosa roxburghii* Tratt in treating type 2 diabetes mellitus based on UPLC-Q-exactive Orbitrap/MS and network pharmacology[J]. *Chinese Medicine*, 2023, 18(1): 12.

[4] Bai L Y, Chiu C F, Chiu S J, et al. Alphitolic acid, an anti-inflammatory triterpene, induces apoptosis and autophagy in oral squamous cell carcinoma cells, in part, through a p53-dependent pathway[J]. *Journal of Functional Foods*, 2015, 18: 368-378.

[5] Raju R, Gunawardena D, Ahktar M A, et al. Anti-inflammatory chemical profiling of the Australian rainforest tree *Alphitonia petriei* (Rhamnaceae)[J]. *Molecules*, 2016, 21(11): 1521.

[6] Masullo M, Montoro P, Autore G, et al. Quali-quantitative determination of triterpenic acids of *Ziziphus jujuba* fruits and evaluation of their capability to interfere in macrophages activation inhibiting NO release and iNOS expression[J]. *Food Research International*, 2015, 77: 109-117.

[7] Aguirre M C, Delporte C, Backhouse N, et al. Topical anti-inflammatory activity of 2 α -hydroxy pentacyclic triterpene acids from the leaves of *Ugni molinae*[J]. *Bioorganic & medicinal chemistry*, 2006, 14(16): 5673-5677.

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