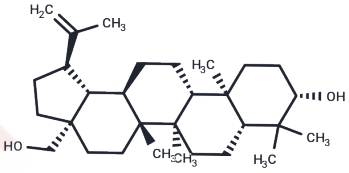
Data Sheet (Cat.No.T3121)

TargetMol

Betulin

Chemical Properties



CAS No. : 473-98-3

Formula: C30H50O2

Molecular Weight: 442.72

Appearance: no data available

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Biological Description

Description	Betulin (betulinol) (lup-20(29)-ene-3β, 28-diol) is an abundant, naturally occurring triterpene. It is commonly isolated from the bark of birch trees where it forms up to 30% of the dry weight of the extractive and is found in birch sap as well.
Targets(IC50)	Apoptosis,Endogenous Metabolite,Lipid,Fatty Acid Synthase
In vitro	Betulin (BE) is recognized for its extensive biological and pharmacological benefits, notably its anticancer and chemopreventive capabilities, which have garnered substantial interest. Research indicates that BE impedes the growth of cancer cells across various cancer types, showing a range of antiproliferative effects—from minimal in human erythroleukaemia cells (K562) to pronounced in human neuroblastoma cells (SK-N-AS). Additionally, BE demonstrates marked cytotoxicity towards primary cancer cell cultures from ovarian, cervical carcinoma, and glioblastoma, with IC50 values between 2.8 to 3.4 μM, notably lower than those in established cell lines. Comparative studies of crude birch bark extract, alongside purified betulin and betulinic acid, reveal significant efficacy against human gastric carcinoma (EPG85-257) and human pancreatic carcinoma (EPP85-181), including drug-sensitive and drug-resistant types, indicating their potential as promising therapeutic agents for cancer treatment.
In vivo	Betulin enhances glucose intolerance, augments basal learning performance, and notably ameliorates oxidative stress by significantly restoring SOD activity while reducing MDA levels in the hippocampus. Further, it significantly mitigates serum and hippocampal inflammatory cytokines. Betulin administration also upregulates Nrf2 and HO-1 expressions and inhibits IκB and NF-κB phosphorylations. Overall, Betulin potentially offers cognitive protection against STZ-induced diabetes in rats through the HO-1/Nrf-2/NF-κB pathway[3].
Cell Research	Chemoresistance is tested using a proliferation assay based on sulphorhodamine B staining. Briefly, 800 cells per well are seeded in triplicate in 96-well plates. After attachment for 24 h, substances are added in dilution series for a 5-day incubation, before SRB staining is performed. Incubation is terminated by replacing the medium with 10% trichloroacetic acid, followed by further incubation at 4°C for 1h. Subsequently, the plates are ished five times with water and stained by adding 100 μL 0.4% SRB in 1% acetic acid for 10 min at room temperature. Ishing the plates five times with 1% acetic acid eliminated unbound dye. After air-drying and re-solubization of the protein bound dye in 10 mM Tris-HCl (pH=8.0), absorbance is read at 562 nm[2].

Solubility Information

Solubility	DMSO: 20 mg/mL (45.18 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.2588 mL	11.2938 mL	22.5876 mL
5 mM	0.4518 mL	2.2588 mL	4.5175 mL
10 mM	0.2259 mL	1.1294 mL	2.2588 mL
50 mM	0.0452 mL	0.2259 mL	0.4518 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Reference

Król, S., Kiełbus, M., Rivero-Müller, A., & Stepulak, A. (2015). Comprehensive Review on Betulin as a Potent Anticancer Agent. Biomed Research International, 2015, 1-11. doi: 10.1155/2015/584189

Guo C, Chi Z, Jiang D, et al. Cholesterol Homeostatic Regulator SCAP-SREBP2 Integrates NLRP3 Inflammasome Activation and Cholesterol Biosynthetic Signaling in Macrophages. Immunity. 2018, 49(5): 842-856. e7

Shi Y H, Liu Z D, Ma M J, et al.Platelet-Derived Growth Factor C Facilitates Malignant Behavior of Pancreatic Ductal Adenocarcinoma by Regulating SREBP1 Mediated Lipid Metabolism.Advanced Science.2024: 2407069.

Drag M, et al. Comparision of the Cytotoxic Effects of Birch Bark Extract, Betulin and Betulinic Acid Towards Human Gastric Carcinoma and Pancreatic Carcinoma Drug-sensitive and Drug-Resistant Cell Lines. Molecules. 2009 Apr 24;14(4):1639-51.

Ma C, et al. Protective effect of betulin on cognitive decline in streptozotocin (STZ)-induced diabetic rats. Neurotoxicology. 2016 Dec;57:104-111.

Guo, Chuansheng, et al. Cholesterol Homeostatic Regulator SCAP-SREBP2 Integrates NLRP3 Inflammasome Activation and Cholesterol Biosynthetic Signaling in Macrophages [J]. Immunity. 2018 Nov 20;49(5):842-856.e7.

Tel:781-999-4286 E_mail:info@targetmol.com Address:36 Washington Street,Wellesley Hills,MA 02481