

Product Data Sheet

Product Name: Inulicin (1-O-Acetylbritannilactone)

Cat. No.: GC33861

Chemical Properties

Cas. No. 33627-41-7

SMILES O[C@H]1[C@@](C2=C)([H])[C@@](OC2=O)([H])CC(C)=C1[C@@H](C)CCOC(C)=O

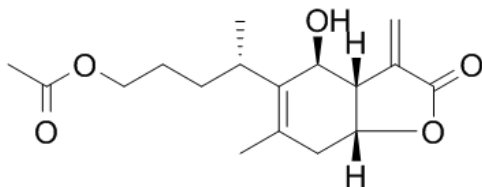
Formula $C_{17}H_{24}O_5$ M.Wt 308.37

Solubility Ethanol : 50 mg/mL (162.14 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	A549 cells (human non-small cell lung cancer cell line)
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Preparation Method	A549 cells were maintained in RPMI-1640 supplemented with 10% fetal calf serum at 37°C, 5% CO ₂ . A549 cells were treated with Inulicin at 10μM for 72 hours. Following treatment, cell proliferation was measured by MTT assay, apoptosis was examined by propidium iodide staining and flow cytometry, and protein expression of NF-κB p65, Bcl-2, Bax, IκBα was analyzed by western blot.
Reaction Conditions	10μM; 72h
Applications	Inulicin inhibited cell growth and induced apoptosis, decreased NF-κB p65 and Bcl-2 expression, and increased Bax and IκBα expression in A549 cells.
Animal experiment [2]:	
Animal models	C57BL/6 mice and nude mice
Preparation Method	C57BL/6 mice were subcutaneously injected with Matrigel plugs containing VEGF, heparin and 20μmol of Inulicin. After 6 days, Matrigel plugs were exposed and IHC staining was performed to identify new microvessels. Nude mice were subcutaneously injected with A549 cells, and when tumor volume reached about 100mm ³ , animals were intraperitoneally administered 12mg/kg/day Inulicin daily. Tumor volume was measured every two days, and at the end of experiment xenograft tumors were isolated and weighted, followed by IHC staining for p-Src and CD31.
Dosage form	20μmol per mouse; s.c. injection (Matrigel plug); single injection 12mg/kg/day; i.p.; daily injection for 20 days

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Applications	Inulicin inhibited VEGF-induced new vasculature formation and microvessels infiltration in C57BL/6 mice. Inulicin inhibited A549 xenograft tumor growth and reduced tumor weight in nude mice. Inulicin reduced p-Src and CD31 intensity in xenograft tumors.
References:[1] Wang F, Li H, Qiao J, et al. 1-O-acetylbritannilactone combined with gemcitabine elicits growth inhibition and apoptosis in A549 human non-small cell lung cancer cells. Mol Med Rep. 2015;12(4):5568-5572.[2] Zhengfu H, Hu Z, Huiwen M, et al. 1-o-acetylbritannilactone(ABL) inhibits angiogenesis and lung cancer cell growth through regulating VEGF-Src-FAK signaling. Biochem Biophys Res Commun. 2015;464(3):422-427.	

Background

Inulicin (1-O-Acetylbritannilactone) is a natural active sesquiterpene lactone that inhibits angiogenesis. Inulicin inhibits VEGF-mediated Src and FAK activation. Inulicin inhibits LPS-induced PGE2 and COX-2 expression, inhibits NF- κ B/AP-1 inflammatory signaling. Inulicin can be used for research on lung cancer, vascular inflammation/neointimal hyperplasia, and inflammatory diseases^[1-4].

In vitro, treatment of LPS-induced RAW264.7 cells with Inulicin for 24 hours inhibited nitric oxide and prostaglandin E2 production and inhibited inducible nitric oxide synthase and cyclooxygenase-2 protein expression^[5]. Treatment of A549 cells with 10 μ M Inulicin for 72 hours inhibited cell growth, induced apoptosis, downregulated NF- κ B p65 and Bcl-2 expression, and upregulated inhibitor of nuclear factor kappa B kinase inhibitor I κ B α and Bax expression^[6]. Pretreatment of vascular smooth muscle cells with 5-20 μ M Inulicin for 1 hour followed by LPS stimulation inhibited LPS-induced PGE2 production and COX-2 expression, inhibited I κ B- α phosphorylation and degradation thereby reducing NF- κ B p65 nuclear translocation, and inhibited activated NF- κ B DNA binding^[7].

In vivo, intraperitoneal injection of 12mg/kg/day Inulicin into A549 xenograft nude mice for 20 days. Inulicin inhibited tumor growth, reduced tumor weight, and decreased p-Src and CD31 intensity in tumor tissues^[8]. Oral administration of 5-10mg/kg Inulicin to high-fat diet-fed C57BL/6J mice every two days for 8 weeks. Inulicin reduced liver weight/tibia length ratio, alleviated liver pathological changes and steatosis, decreased serum AST, ALT, TG, TCH, and LDL-C, reduced hepatic lipid

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accumulation and fibrosis, lowered serum and liver IL-1 β , and inhibited NLRP3 and NEK7 interaction in liver tissues^[9]. A single intraperitoneal injection of 40-60mg/kg Inulicin into ICR mice followed 30 minutes later by intravenous injection of 1mg/kg LPS. Inulicin reduced serum and peritoneal lavage fluid levels of CCL2, TNF- α , and IL-6^[10].

References:

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- [2] Zhi XY, Zhang Y, Li YF, et al. Discovery of Natural Sesquiterpene Lactone 1- O-Acetylbritannilactone Analogues Bearing Oxadiazole, Triazole, or Imidazole Scaffolds for the Development of New Fungicidal Candidates. *J Agric Food Chem.* 2023 Aug 2;71(30):11680-11691.
- [3] Dong S, Tang JJ, Zhang CC, et al. Semisynthesis and in vitro cytotoxic evaluation of new analogues of 1-O-acetylbritannilactone, a sesquiterpene from *Inula britannica*. *Eur J Med Chem.* 2014 Jun 10;80:71-82.
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- [5] Lee I.S, Lee Y.-R, Sim J.H, et al. The Effects of 1-O-Acetylbritannilactone Isolated from *Inula britannica* Flowers on Human Neutrophil Elastase and Inflammation of RAW 264.7 Cells and Zebrafish Larvae. *Molecules.* 2023;28(11):4320.
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