Alantolactone

Cat. No.: HY-N0038

CAS No.: 546-43-0

Molecular Formula: $C_{15}H_{20}O_2$

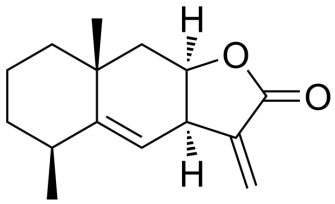
Molecular Weight: 232.32

Target: STAT; Apoptosis; TGF-beta/Smad

Pathway: JAK/STAT Signaling; Stem Cell/Wnt; Apoptosis; TGF-beta/Smad

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (430.44 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	4.3044 mL	21.5220 mL	43.0441 mL
5 mM	0.8609 mL	4.3044 mL	8.6088 mL
10 mM	0.4304 mL	2.1522 mL	4.3044 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (10.76 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (10.76 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.76 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Alantolactone is a selective STAT3 inhibitor, with potent anticancer activity. Alantolactone induces apoptosis in cancer[1][2][3].

IC_{50} & Target

STAT3

In Vitro

Alantolactone induces apoptosis in HepG2 cells in a dose-dependent manner. This Alantolactone-induced apoptosis is found to be associated with GSH depletion, inhibition of STAT3 activation, ROS generation, mitochondrial transmembrane

potential dissipation, and increased Bax/Bcl-2 ratio and caspase-3 activation[1]. Alantolactone decreases STAT3 translocation to the nucleus, its DNA-binding, and STAT3 target gene expression. Alantolactone significantly inhibits STAT3 activation with a marginal effect on MAPKs and on NF-κB transcription; however, this effect is not mediated by inhibiting STAT3 upstream kinases[2].

Alantolactone induces activin/SMAD3 signaling in human colon adenocarcinoma HCT-8 cells. Alantolactone performs its antitumor effect by interrupting the interaction between Cripto-1 and the activin receptor type IIA in the activin signaling pathway[4].

Alantolactone (5 μg/mL, 24 h) inhibits cell proliferation in colon adenocarcinoma HCT-8 cells[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[4]

Cell Line:	HCT-8 cells.
Concentration:	5 μg/mL (~21.6 μM).
Incubation Time:	24 h.
Result:	Activated the activin signaling pathway in HCT-8 cells.

In Vivo

It is found that the average tumor volume in the Alantolactone-treated mice is approximately 2.17-fold lower compared with that in the control mice. However the administration of Alantolactone does not affect the overall bodyweight during the experimental period, suggesting no apparent toxicity. Additionally, the average tumor weight is significantly lower in the Alantolactone-treated mice compared with the control mice. What's more, the administration of Alantolactone results in a significant decrease in p-STAT3 and cyclin D1 expression in the tumor tissues[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Female athymic BALB/c nude mice at the age of 6 weeks[2].
Dosage:	2.5 mg/kg.
Administration:	I.P. injection every 2 days.
Result:	Exhibited anti-cancer activity.

CUSTOMER VALIDATION

- EBioMedicine. 2022 Sep 28;85:104274.
- Pharmacol Res. 2020 May;155:104751.
- Phytomedicine. 2023 Oct 21, 155159.
- Cancer Cell Int. 2020 Sep 9;20:442.
- Front Pharmacol. 28 September 2021.

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REFERENCES

[1]. Khan M, et al. Alantolactone induces apoptosis in HepG2 cells through GSH depletion, inhibition of STAT3 activation, and mitochondrial dysfunction. Biomed Res Int. 2013;2013:719858.

[2]. Chun J, et al. Alantolactone selectively suppresses STAT3 activation and exhibits potent anticancer activity in MDA-MB-231 cells. Cancer Lett. 2015 Feb 1;357(1):393-403.

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

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