Withanolide B

Cat. No.: HY-129566

CAS No.: 56973-41-2

Molecular Formula: $C_{28}H_{38}O_5$

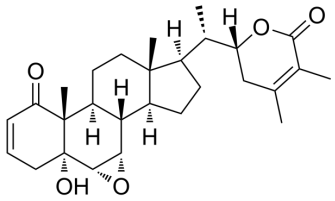
Molecular Weight: 454.6

Target: ERK; Wnt; β-catenin

Pathway: MAPK/ERK Pathway; Stem Cell/Wnt

Storage:

Powder	-20°C	3 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 3.33 mg/mL (7.33 mM; Need ultrasonic)

Acetone : 1 mg/mL (2.20 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.1997 mL	10.9987 mL	21.9974 mL
5 mM	0.4399 mL	2.1997 mL	4.3995 mL
10 mM	---	---	---

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: 0.33 mg/mL (0.73 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 0.33 mg/mL (0.73 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 0.33 mg/mL (0.73 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Withanolide B is an active component of W. somnifera Dunal. Withanolide B promotes osteogenic differentiation of hBMSCs via ERK1/2 and Wnt/β-catenin signaling pathways. Withanolide B exhibits neuroprotective, anti-arthritic, anti-aging and anti-cancer effects[1][2][3].

In Vitro

Withanolide B (1-100 nM; 3-5 days) significantly increases the expression of COL1A1 and RUNX2 genes and proteins in hBMSCs[1].

Withanolide B (1-100 nM; 11 or 3 days) increases the formation of extracellular matrix calcium deposits and increased the

activity of alkaline phosphatase (ALP)[1].
Withanolide B (1-100 nM; 3-5 days) increases the protein expressions of p-ERK and active β-catenin of hBMSCs[1].
Withanolide B (10-100 μM; 48 h) reverses the Aβ42 aggregation-induced toxicy in SK-N-SH cells[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[1]

Cell Line:	Human bone mesenchymal stem cells
Concentration:	1, 10, 100 nM
Incubation Time:	3, 5 days
Result:	Significantly increased the expression of COL1A1 and RUNX2.

In Vivo

Withanolide B (10 mg/kg; topical administration) promotes bone healing in a rat tibial defect model[1].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male Sprague-Dawley rats (8 weeks, 200 g) with tibial defect[1]
Dosage:	10 mg/kg
Administration:	Injected in situ at the bone defect site at different time points (0, 3, 5, 7, and 9 days)
Result:	Increased the trabecular number, trabecular thickness and the thickness of the cortical bone.

REFERENCES

[1]. Kuang Z, et, al. Withanolide B promotes osteogenic differentiation of human bone marrow mesenchymal stem cells via ERK1/2 and Wnt/β-catenin signaling pathways. Int Immunopharmacol. 2020 Nov;88:106960.

[2]. Dubey S, et, al. Improving the inhibition of β-amyloid aggregation by withanolide and withanoside derivatives. Int J Biol Macromol. 2021 Mar 15;173:56-65.

[3]. Sivanandha G, et, al. Enhanced biosynthesis of withanolides by elicitation and precursor feeding in cell suspension culture of Withania somnifera (L.) Dunal in shake-flask culture and bioreactor. PLoS One. 2014 Aug 4;9(8):e104005.

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