

(-)-Blebbistatin

Chemical Properties

CAS No. : 856925-71-8

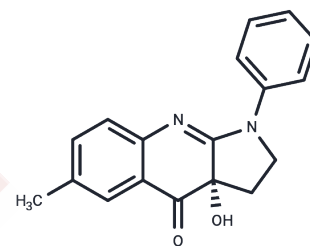
Formula: C₁₈H₁₆N₂O₂

Molecular Weight: 292.33

Storage: Store at low temperature, Keep away from moisture,
Keep away from direct sunlight

Powder: -20°C for 3 years

Actual storage temperature shall be subject to the COA.



Biological Description

Description	(-)-Blebbistatin ((S)-(-)-Blebbistatin) is an S enantiomer of blebbistatin. It is a potent and selective myosin II inhibitor with IC ₅₀ ranging from 0.5 to 5 μM.
Targets(IC ₅₀)	ATPase, Myosin
In vitro	<p>METHODS: Mouse hepatic stellate cell HSCs were treated with (-)-Blebbistatin (12.5-50 μM) for 2 h and cell morphology was observed using microscopy.</p> <p>RESULTS: When treated with (-)-Blebbistatin for 2 h, the cells became smaller, acquired more dendritic morphology, and had fewer stress fibers and lamellipods. [1]</p> <p>METHODS: Porcine TM cells were treated with (-)-Blebbistatin (25-100 μM) for 2 h. The expression levels of target proteins were detected using Western Blot.</p> <p>RESULTS: There was no difference in MLC phosphorylation status between control and drug-treated samples. [2]</p>
In vivo	Blebbistatin completely relaxes both KCl- and carbachol-induced rat detrusor and endothelin-1-induced human bladder contraction in a dose-dependent manner. Pre-incubation with 10 μM blebbistatin attenuates carbachol responsiveness by 65% while blocking electrical field stimulation-induced bladder contraction reaching 50% inhibition at 32 Hz[4].
Kinase Assay	Inhibition of Cox Activity: Inhibition of Cox-1 activity is measured by monitoring oxygen consumption during the conversion of arachidonic acid to PGs using a Clark-type O ₂ -electrode. The reaction mixture contains ~0.2 units Cox-1 in 100 μL of microsome fraction derived from ram seminal vesicles as a crude source of Cox-1 (specific activity 0.2-1 units/mg protein) or 0.23 units of recombinant human Cox-2 (specific activity 43 units/mg protein). For calculation, the rate of O ₂ consumption is compared with a DMSO control (100% activity). Piroxicam, a nonsteroidal anti-inflammatory drug, is used as positive inhibitory substance for Cox-1 activity with an IC ₅₀ of 0.35 ± 0.05 μM (n = 2). Alternatively, nimesulide, a Cox-2 specific inhibitor, inhibits Cox-2 activity by 52 ± 5.7% (n = 2) at a concentration of 50 μM.
Cell Research	Freshly isolated HSCs are replated on 96-well plate. At day 3, medium is replaced by serum-free medium and cells are starved overnight, treated with or without blebbistatin (25 μM) for 2 h followed by stimulation with platelet-derived growth factor-BB (20 ng/mL). After an overnight incubation, the WST-1 cell proliferation assay are performed

Cell Research	[3].
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Solubility Information

Solubility	DMSO: 105 mg/mL (359.18 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 2.93 mg/mL (10.02 mM),Suspension. <i>Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.</i>

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	3.4208 mL	17.104 mL	34.2079 mL
5 mM	0.6842 mL	3.4208 mL	6.8416 mL
10 mM	0.3421 mL	1.7104 mL	3.4208 mL
50 mM	0.0684 mL	0.3421 mL	0.6842 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.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

- Liu Z, et al. Blebbistatin inhibits contraction and accelerates migration in mouse hepatic stellate cells. *Br J Pharmacol.* 2010 Jan 1;159(2):304-15.
- Sahara S, Ueno A, Wakita N, et al.(S)-(-)-blebbistatin O-benzoate has the potential to improve atopic dermatitis symptoms in NC/Nga mice by upregulating epidermal barrier function and inhibiting type 2 alarmin cytokine induction.*PloS one.*2024, 19(5): e0302781.
- Zhang M, et al. Blebbistatin, a novel inhibitor of myosin II ATPase activity, increases aqueous humor outflow facility in perfused enucleated porcine eyes. *Invest Ophthalmol Vis Sci.* 2005 Nov;46(11):4130-8.
- Zhang Y, et al. The Myosin II Inhibitor, Blebbistatin, Ameliorates FeCl₃-induced Arterial Thrombosis via the GSK3 β -NF- κ B Pathway. *Int J Biol Sci.* 2017 May 15;13(5):630-639.
- Zhang X, et al. In vitro and in vivo relaxation of urinary bladder smooth muscle by the selective myosin IIinhibitor, blebbistatin. *BJU Int.* 2011 Jan;107(2):310-7.
- Tian X, Gao M, Li A, et al. Protocol for Isolation of Viable Adult Rat Cardiomyocytes with High Yield[J]. *STAR Protocols.* 2020: 100045.

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