# (-)-Blebbistatin

**Cat. No.:** HY-13441

**CAS No.:** 856925-71-8

**Molecular Formula:** $C_{18}H_{16}N_2O_2$

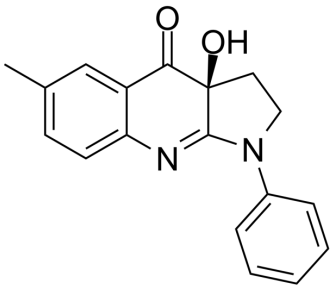
**Molecular Weight:** 292.33

**Target:** Myosin

**Pathway:** Cytoskeleton

**Storage:** 4°C, stored under nitrogen

* The compound is unstable in solutions, freshly prepared is recommended.




## SOLVENT & SOLUBILITY

**In Vitro**

DMSO : 10 mg/mL (34.21 mM; Need ultrasonic)

$H_2O$ : < 0.1 mg/mL (insoluble)

**Preparing Stock Solutions**

| Concentration \ Mass / Solvent | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 3.4208 mL | 17.1040 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 |

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: ≥ 1 mg/mL (3.42 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 1 mg/mL (3.42 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 1 mg/mL (3.42 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

(-)-Blebbistatin is a selective inhibitor of the ATPase activity of non-muscle myosin II[1][2].

**$IC_{50}$ & Target**

IC50: 0.5 to 5 μM (myosin II)[1]

**In Vitro**

Blebbistatin potently inhibits several striated muscle myosins as well as vertebrate nonmuscle myosin IIA and IIB with $IC_{50}$ values ranging from 0.5 to 5 μM. Smooth muscle myosin is only poorly inhibited ($IC_{50}$=80 μM)[1]. Blebbistatin does not compete with nucleotide binding to the skeletal muscle myosin subfragment-1. The inhibitor preferentially binds to the ATPase intermediate with ADP and phosphate bound at the active site, and it slows down phosphate release. It blocks the

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| | myosin heads in a products complex with low actin affinity[2]. In culture-activated hepatic stellate cells, blebbistatin is found to change both cell morphology and function. Stellate cells become smaller, acquire a dendritic morphology and have less myosin IIA-containing stress fibres and vinculin-containing focal adhesions. Blebbistatin impairs silicone wrinkle formation, reduces collagen gel contraction and blocks endothelin-1-induced intracellular $Ca^{2+}$ release. It promotes wound-induced cell migration[3].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | Blebbistatin dose-dependently and completely relax both KCl- and carbachol-induced rat detrusor and endothelin-1-induced human bladder contraction. 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].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## PROTOCOL

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| **Cell Assay** [3] | 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[3].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

## CUSTOMER VALIDATION

- Circulation. 2023 Nov 14.
- Adv Sci (Weinh). 2022 Mar 3;e2104682.
- Adv Sci (Weinh). 2020 Jun 17;7(15):1903583.
- Theranostics. 2019 Apr 13;9(9):2555-2571.
- Cell Death Dis. 2023 Oct 10;14(10):663.

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## REFERENCES

[1]. Cristina Lucas-Lopez, et al. Absolute Stereochemical Assignment and Fluorescence Tuning of the Small Molecule Tool, (–)-Blebbistatin.

[2]. Ponsaerts R, et al. The myosin II ATPase inhibitor blebbistatin prevents thrombin-induced inhibition of intercellularcalcium wave propagation in corneal endothelial cells. Invest Ophthalmol Vis Sci. 2008 Nov;49(11):4816-27.



Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com
Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA