Monastrol

Cat. No.: HY-101071A

CAS No.: 329689-23-8

Molecular Formula: $C_{14}H_{16}N_2O_3S$

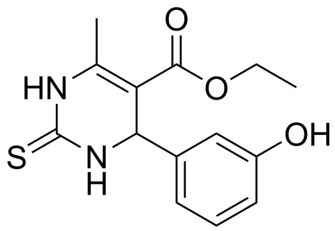
Molecular Weight: 292.35

Target: Kinesin; Apoptosis

Pathway: Cell Cycle/DNA Damage; Cytoskeleton; Apoptosis

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 33 mg/mL (112.88 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.4206 mL	17.1028 mL	34.2056 mL
5 mM	0.6841 mL	3.4206 mL	6.8411 mL
10 mM	0.3421 mL	1.7103 mL	3.4206 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 (8.55 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (8.55 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (8.55 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Monastrol is a potent and cell-permeable inhibitor of the mitotic kinesin Eg5 with an IC_{50} value of 14 μM.

IC_{50} & Target

Eg5

14 μM (IC_{50})

In Vitro

Monastrol is a small, cell-permeable molecule that arrests cells in mitosis by specifically inhibiting Eg5, a member of the

Kinesin-5 family. Monastrol treatment of dividing cells results in spindle collapse and cell cycle arrest with a monoastral spindle, which is similar to the phenotype observed when Eg5 is inhibited by anti-Eg5 antibodies[1]. Monastrol is an allosteric inhibitor of the mitotic kinesin Eg5 that exhibits an antiproliferative effect against several cell lines. Monastrol treatment can decrease cell viability in MCF-7 tumor cells. Real-time cell growth kinetic analysis showed a decrease in the proliferation of MCF-7 cells exposed to monastrol[2].

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

PROTOCOL

Cell Assay [2]

The cytotoxicity assay is performed with MTT. Cells are seeded in 96-well culture plates (5000 cells/well) and incubated for 24 h for stabilization. After this period, the following treatments are administered for 24 and 48 h: vehicle control (0.5 % DMSO); 1 μM doxorubicin and monastrol at 5, 25, 50, 75, and 100 μM. After each time of treatment, the medium is withdrawn, serum-free media containing 0.5 mg/mL MTT salt is added and incubated for 4 h, and formazan crystal products are diluted [2].

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

CUSTOMER VALIDATION

- Proc Natl Acad Sci U S A. 2023 May 16;120(20):e2303479120.
- Comput Struct Biotechnol J. 1 October 2021.
- Int J Biol Sci. 2021 Jan 1;17(2):514-526.

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REFERENCES

[1]. Cochran JC, et al. Monastrol inhibition of the mitotic kinesin Eg5. J BiolChem. 2005 Apr 1;280(13):12658-67.

[2]. Marques LA, et al. Antiproliferative activity of monastrol in human adenocarcinoma (MCF-7) and non-tumor (HB4a) breast cells. Naunyn Schmiedebergs Arch Pharmacol. 2016 Dec;389(12):1279-1288.

[3]. Mayer TU, et al. Small molecule inhibitor of mitotic spindle bipolarity identified in a phenotype-based screen. Science. 1999 Oct 29;286(5441):971-4.

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