Mebendazole

Cat. No.: HY-17595

CAS No.: 31431-39-7

Molecular Formula: $C_{16}H_{13}N_3O_3$

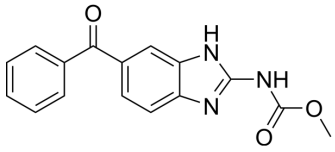
Molecular Weight: 295.29

Target: Parasite; Apoptosis; Microtubule/Tubulin

Pathway: Anti-infection; Apoptosis; Cell Cycle/DNA Damage; Cytoskeleton

Storage:

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



SOLVENT & SOLUBILITY

In Vitro

DMSO : 4.17 mg/mL (14.12 mM; Need ultrasonic)

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

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.3865 mL	16.9325 mL	33.8650 mL
5 mM	0.6773 mL	3.3865 mL	6.7730 mL
10 mM	0.3387 mL	1.6933 mL	3.3865 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: ≥ 0.42 mg/mL (1.42 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 0.42 mg/mL (1.42 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 0.42 mg/mL (1.42 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Mebendazole is a highly effective, broad-spectrum antihelmintic against nematode infestations. Mebendazole also exhibits inhibitory effect against glioblastoma multiforme (GBM), inhibits Hedgehog pathway and tubulin polymerization. Mebendazole is orally active and can cross CNS penetration[1][2][3].

IC_{50} & Target

Tublin polymerization[1]; Hedgehog[2]; Parasite[3]

In Vitro

Mebendazole (1 nM-0.1 mM; 72 h) shows inhibition of GL261 mouse glioma cells with IC_{50} value of 0.24 μM[1].
Mebendazole (0.1 μM and 1 μM; 24 h) disrupts microtubule polymerization and microtubule structure in 060919 glioblastoma multiforme (GBM) cells[1].
Mebendazole (10 nM-10 μM; 48 h) inhibits Hh signaling and reduces the expression of downstream Hh pathway effectors, by decreasing Gli1 transcript and protein expression in tumor tissues. Mebendazole inhibits Gli1 expression with an IC_{50} value of 516 nM[2].
Mebendazole (10 nM-10 μM; 48 h) prevents the formation of the primary cilium, and decreases the proliferation and survival of human medulloblastoma cells with constitutive Hh activation[2].
A combination of mebendazole and Vismodegib (HY-10440) achieved additive inhibition of canonical Hh signaling[2].
Mebendazole has effectively treated CNS echinococcosis in numerous clinical settings before, indicating significant CNS penetration property[3].

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

Immunofluorescence[1]

Cell Line:	Glioblastoma multiforme (GBM) 060919 cells
Concentration:	1 μM
Incubation Time:	24 hours
Result:	Disrupted microtubule structure.

Immunofluorescence[2]

Cell Line:	DAOY and hTERT-RPE1 cells
Concentration:	0, 0.1, 0.5, 0.75, and 1 μM
Incubation Time:	12 hours
Result:	Decreased GLI1 protein level and increased cleavage of caspase-3 protein level.

In Vivo

Mebendazole (50 mg/kg; p.o.; once daily for first 20 d and 5 d per week with 2 d off; 45 d) inhibits intracranial tumor growth in the syngeneic GL261 mouse model and 060919 human glioblastoma multiforme (GBM) xenograft mouse model[1].

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

Animal Model:	C57BL/6 mice (5-6 weeks old) implanted with GL261 glioma cells and 060919 human glioblastoma multiforme (GBM)[1]
Dosage:	50 mg/kg; delivered with 50% (v/v) sesame oil and PBS[2]
Administration:	Oral gavage; beginning 5 days after tumor implantation at a daily dose of 50 mg/kg for the first 20 days of treatment then changed to 50 mg/kg for 5 days, with 2 days off, each week.
Result:	Increased the mean survival to 49 days compared with the 30 days of control in syngeneic GL261 mouse model. Increased the mean survival to 65 days compared with the 48 days of control in 060919 human glioblastoma multiforme (GBM) xenograft mouse model.

CUSTOMER VALIDATION

- Acta Pharmacol Sin. 2021 Aug 25.
- Commun Biol. 2024 Jan 24;7(1):123.

- PLoS Negl Trop Dis. 2019 Aug 20;13(8):e0007681.

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REFERENCES

[1]. Bai RY, et al. Antiparasitic mebendazole shows survival benefit in 2 preclinical models of glioblastoma multiforme. Neuro Oncol. 2011 Sep;13(9):974-82.

[2]. Larsen AR, et al. Repurposing the antihelmintic mebendazole as a hedgehog inhibitor. Mol Cancer Ther. 2015 Jan;14(1):3-13.

[3]. Erdinçler P, et al. The role of mebendazole in the surgical treatment of central nervous system hydatid disease. Br J Neurosurg. 1997 Apr;11(2):116-20.

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