Pentamidine

Cat. No.: HY-B0537

CAS No.: 100-33-4

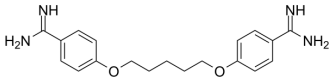
Molecular Formula: $C_{19}H_{24}N_4O_2$

Molecular Weight: 340.42

Target: Parasite; Fungal; Phosphatase; Bacterial; Antibiotic

Pathway: Anti-infection; Metabolic Enzyme/Protease

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 6.25 mg/mL (18.36 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.9375 mL	14.6877 mL	29.3755 mL
	5 mM	0.5875 mL	2.9375 mL	5.8751 mL
	10 mM	0.2938 mL	1.4688 mL	2.9375 mL

Please refer to the solubility information to select the appropriate solvent.

BIOLOGICAL ACTIVITY

Description

Pentamidine (MP-601205) is an antimicrobial agent and interferes with DNA biosynthetics. Pentamidine inhibits parasite ***Leishmania infantum*** with an IC_{50} of 2.5 μM. Pentamidine is a potent and selective protein tyrosine phosphatases (PTPases) and phosphatase of regenerating liver (PRL) inhibitor. Pentamidine has the potential for Gambian trypanosomiasis, antimony-resistant leishmaniasis, and Pneumocystis carinii pneumonia treatment. Antitumor and antibacterial activities[1][2][3][4].

IC_{50} & Target		
	Trypanosoma	Leishmania

In Vitro

Pentamidine (0-10 μg/mL; 6 days; WM9, DU145, C4-2, Hey, WM480, and A549 cells) treatment inhibits the growth of cancer cells in a concentration-dependent manner[1].

The cytotoxic properties of Pentamidine isethionate towards the promastigotes of the protozoan parasite Leishmania infantum is determined. The leishmanicidal activity of Pentamidine isethionate is 60 times higher after 72 h of incubation than that of Cisplatin. Pentamidine isethionate induces a higher amount of programmed cell death (PCD) than Cisplatin, which is associated with inhibition of DNA synthesis and cell-cycle arrest in the G2/M phase. Binding of Pentamidine isethionate to calf-thymus DNA (CT-DNA) induces conformational changes in the DNA double helix, consistent with a B-->A transition. The interaction of Pentamidine isethionate with ubiquitin leads to a 6% increase in the beta-sheet content of the protein[2].

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

Cell Viability Assay[1]

Cell Line:	WM9, DU145, C4-2, Hey, WM480, and A549 cells
Concentration:	0-10 μg/mL
Incubation Time:	6 days
Result:	The growth of all six of the cell lines in culture was inhibited in a concentration-dependent manner with complete growth inhibition of the cell lines occurring at 10 μg/mL.

In Vivo

Pentamidine (0.25 mg/mouse; intramuscular injection; every 2 days; for 4 weeks; athymic nude mice) treatment markedly inhibits the growth of WM9 human melanoma tumors in nude mice[1].

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

Animal Model:	Athymic nude mice (6 weeks old) injected with WM9 cells[1]
Dosage:	0.25 mg/mouse
Administration:	Intramuscular injection; every 2 days; for 4 weeks
Result:	Markedly inhibited the growth of WM9 human melanoma tumors in nude mice.

CUSTOMER VALIDATION

- Immunity. 2023 Feb 14;56(2):272-288.e7.
- Int J Mol Sci. 2023 Sep 5, 24(18), 13812.
- Drug Des Dev Ther. 2021 Jul 1;15:2857-2868.
- Molecules. 2020 Apr 23;25(8):1980.
- Microbiol Spectr. 2023 May 1;e0313822.

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REFERENCES

[1]. Pathak MK, et al. Pentamidine is an inhibitor of PRL phosphatases with anticancer activity. Mol Cancer Ther. 2002 Dec;1(14):1255-64.

[2]. Nguewa, P.A., et al., Pentamidine is an antiparasitic and apoptotic drug that selectively modifies ubiquitin. Chem Biodivers, 2005. 2(10): p. 1387-400.

[3]. Sands M, et al. Pentamidine: a review. Rev Infect Dis. 1985 Sep-Oct;7(5):625-34.

[4]. David C. Bean, et al. Pentamidine: a drug to consider re-purposing in the targeted treatment of multi-drug resistant bacterial infections? J Lab Precis Med 2017;2:49.

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