Pantethine

Cat. No.: HY-B1028

CAS No.: 16816-67-4

Molecular Formula: $C_{22}H_{42}N_4O_8S_2$

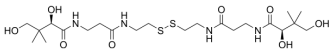
Molecular Weight: 554.72

Target: Endogenous Metabolite; SARS-CoV

Pathway: Metabolic Enzyme/Protease; Anti-infection

Storage:

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



SOLVENT & SOLUBILITY

In Vitro

H_2O : ≥ 100 mg/mL (180.27 mM)
DMSO : ≥ 100 mg/mL (180.27 mM)
Ethanol : 100 mg/mL (180.27 mM; Need ultrasonic)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.8027 mL	9.0136 mL	18.0271 mL
5 mM	0.3605 mL	1.8027 mL	3.6054 mL
10 mM	0.1803 mL	0.9014 mL	1.8027 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (180.27 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (4.51 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (4.51 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (4.51 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Pantethine is an orally active lipid-lowering agent. Pantethine has anti-tumor, anti-inflammatory and anti-SARS-COV virus activities. Pantethine is also a neuroprotective agent. Pantethine can be used in the study of Alzheimer's disease,

Parkinson's disease, major depression, systemic sclerosis and pantothenate kinase-related neurodegeneration[1][2][3][4][5][6].

In Vitro

Pantethine (10-1000 μM) inhibits cholesterol production in mouse liver slices[1].
Pantethine (250-1000 μM; 24 h and 72 h) reduces cholesterol levels in Vero E6 cells (35% at 24 h and 80% at 72 h)[2].
Pantethine(100-1000 μM; After pretreatment for 1 h, the virus is added and incubated together for 2 h until the end of the experiment) reduces the infection of SARS-CoV-2 to Vero E6 and Calu-3a cells in a dose-dependent manner, which has antiviral effect[2].
Pantethine (50-100 μM; 18 h) inhibits the release of microparticles (MPs) in a dose-dependent manner in endothelial HPMECs and HUVECs. (50-100 μM; 24 h) eliminates MP-induced oxidative and nitrosation stress in endothelial cells (HPMECs and HUVECs) and fibroblasts (NIH3T3)[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis [2]

Cell Line:	Calu-3a, Vero E6
Concentration:	50 μM, 100 μM, 250 μM, 500 μM, 1000 μM
Incubation Time:	Cell were pretreated with Pantethine for 1 h prior to virus infection, followed by incubation with the virus for 2 h in the presence of Pantethine until the end of the experiment.
Result:	Decreased the expression of viral spike (S) and nucleocapsid (N) proteins.

RT-PCR [2]

Cell Line:	Calu-3a, Vero E6
Concentration:	50 μM, 100 μM, 250 μM, 500 μM, 1000 μM
Incubation Time:	Cell were pretreated with Pantethine for 1 h prior to virus infection, followed by incubation with the virus for 2 h in the presence of Pantethine until the end of the experiment.
Result:	Significantly reduced the copy number of viral nucleapsid (N) and non-structural protein 6 (NSP6) genes in the cell supernatant. Decreased the mRNA expression levels of HECT E3 ligase and TMPRSS2 in virus-induced infected cells. Significantly decreased the mRNA expression of MAVS, IRF3, IFNβ, STING, TNF-α and IL6 in Calu-3a cells, and decreased the inflammation caused by SARS-CoV-2 virus infection.

In Vivo

Pantethine (1.2 mmol/kg; Intragastrical administration (i.g.); Single dose) can reduce blood lipid in rats[1].
Pantethine (750 mg/kg; Intraperitoneal injection (i.p.); Once daily for 4 weeks) shows antitumor activity in mice with in-situ ovarian cancer [3].
Pantethine (150 mg/kg; p.o.; Once daily for 6 weeks) reduces skin and lung fibrosis associated with markers of oxidative and endothelial stress in mice with systemic sclerosis (SSc)[5].
Pantethine (15 mg/kg; Supplemented in daily drinking water, for 2 months) is able to effectively restore the disease status induced by the ketogenic diet in mice[6].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male Sprague–Dawley rats model[1]
Dosage:	1.2 mmol/kg
Administration:	Intragastrical administration (i.g.); Single dose
Result:	Reduced plasma free fatty acid (FFA), cholesterol, and triglyceride levels at 3, 5, 7, and 24

	h, while significantly increased glycerol levels at 7 h.

Animal Model:	Orthotopic female rats model of ovarian cancer[3]
Dosage:	750 mg/kg
Administration:	Intraperitoneal injection (i.p.); Once daily for 4 weeks
Result:	Reduced tumor growth, metastasis and ascites, and had no toxicity to liver and kidney.

Animal Model:	Systemic sclerosis (SSc) BALB/c mice model[5]
Dosage:	15 mg/kg
Administration:	Oral gavage (p.o.); Once daily for 6 weeks. After HOCL treatment (200 μM; Intradermal injection; Once daiy for 6 weeks).
Result:	Decreased the number of MPs in mice endothelial cells. Decreased the concentrations of soluble E-selectin and sVCAM-1 in serum. Decreased serum concentration of AOPPs (33%) and nitrate (60%).

Animal Model:	Ketogenic diet mouse model[6]
Dosage:	150 mg/kg
Administration:	Supplemented in daily drinking water, for 2 months. Follow a casual ketogenic diet during this period.
Result:	Alleviated motor dysfunction, neurodegeneration and changes in mitochondria of the central and peripheral nervous systems in mice.

CUSTOMER VALIDATION

- Mol Nutr Food Res. 2023 May 16;e2200799.

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REFERENCES

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[6]. Brunetti D, et al. Pantethine treatment is effective in recovering the disease phenotype induced by ketogenic diet in a pantothenate kinase-associated neurodegeneration mouse model. Brain. 2014 Jan;137(Pt 1):57-68.

Caution: Product has not been fully validated for medical applications. For research use only.

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