Colistin sulfate

Cat. No.: HY-A0089

CAS No.: 1264-72-8

Molecular Formula: $C_{52}H_{98}N_{16}O_{13}.2.5H_2O_4S$

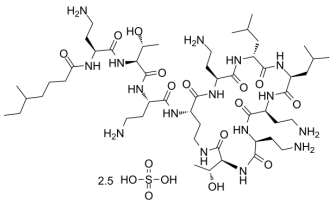
Molecular Weight: 1400.64

Target: Bacterial; Autophagy; Antibiotic

Pathway: Anti-infection; Autophagy

Storage: 4°C, sealed storage, away from moisture

* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

H_2O : 50 mg/mL (35.70 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	0.7140 mL	3.5698 mL	7.1396 mL
	5 mM	0.1428 mL	0.7140 mL	1.4279 mL
	10 mM	0.0714 mL	0.3570 mL	0.7140 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 50 mg/mL (35.70 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Colistin sulfate is a polypeptide antibiotic which inhibits gram-negative bacteria by binding to lipopolysaccharides and phospholipids in the outer cell membrane of gram-negative bacteria.

In Vitro

Colistins are bactericidal to gram-negative bacteria by a detergent-like mechanism. This mechanism involves interaction with lipopolysaccharides and phospholipids of the outer membrane and electrostatic interference with the outer membrane by competitively displacing divalent cations (calcium and magnesium) from the negatively charged phosphate groups of membrane lipids[1]. Colistin (polymyxin E) owns favorable properties of rapid bacterial killing, a narrow spectrum of activity, and an associated slow development of resistance for the treatment of infections caused by multidrug-resistant gram-negative bacteria. There are two forms of colistin available commercially: colistin (sulfate) mainly for topical use and colistin methanesulfonate (sodium) for parenteral use[2].

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

In Vivo

High concentrations of colistin in rat ELF are achieved as a result of slow and sustained CMS conversion following i.t. instillation[3]. Colistin is often used in piglets but underdosing and overdosing are frequent. Under- or overdoses of colistin

do not result in any major disturbance of piglet fecal microbiota and rarely select for chromosomal resistance in the dominant E. coli population[4].

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PROTOCOL

Animal Administration [3]

Rats: Colistin methanesulfonate (sodium) and colistin (sulfate) dosing solutions are freshly prepared in sterile 0.9% sodium chloride. For the i.v. studies, colistin methanesulfonate (CMS) or sulfate solutions are administered by a bolus injection via the jugular vein cannula. Intratracheal (i.t.) instillation is utilized as the technique for pulmonary administration. Animals are administered i.v. CMS at doses of 14 mg/kg of body weight, 28 mg/kg or 56 mg/kg. In an independent study, rats are administered i.v. colistin at doses of 0.21 mg/kg, 0.41 mg/kg, or 0.62 mg/kg[3].

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CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- Adv Sci (Weinh). 2020 Jul 21;7(17):2001374.
- Clin Microbiol Infect. 2020 Sep;26(9):1264-1265.
- Emerg Microbes Infect. 2024 Dec;13(1):2321981.
- Microorganisms. 2024 Mar 13, 12(3), 575.

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REFERENCES

[1]. Hancock RE et al. Peptide antibiotics. Antimicrob Agents Chemother. 1999 Jun;43(6):1317-23.

[2]. Li J, et al. In vitro pharmacodynamic properties of colistin and colistin methanesulfonate againstPseudomonas aeruginosa isolates from patients with cystic fibrosis. Antimicrob Agents Chemother. 2001 Mar;45(3):781-5.

[3]. W S Yapa S, et al. Population pharmacokinetics of colistin methanesulfonate in rats: achieving sustained lung concentrations of colistin for targeting respiratory infections. Antimicrob Agents Chemother. 2013 Oct;57(10):5087-95.

[4]. Fleury MA, et al. Impact of two different colistin dosing strategies on healthy piglet fecal microbiota. Res Vet Sci. 2016 Aug;107:152-60.

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