Ceftazidime pentahydrate

Cat. No.: HY-B0593A

CAS No.: 78439-06-2

Molecular Formula: $C_{22}H_{32}N_6O_{12}S_2$

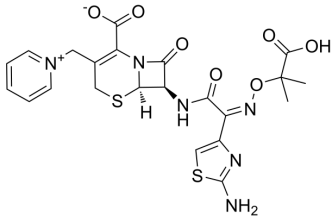
Molecular Weight: 636.65

Target: Bacterial; Antibiotic; Beta-lactamase

Pathway: Anti-infection

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

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



$5H_2O$

SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (157.07 mM; Need ultrasonic)

H_2O : 31.25 mg/mL (49.09 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.5707 mL	7.8536 mL	15.7072 mL
5 mM	0.3141 mL	1.5707 mL	3.1414 mL
10 mM	0.1571 mL	0.7854 mL	1.5707 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 (3.93 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (3.93 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Ceftazidime (GR20263) pentahydrate , an antibiotic, has a broad spectrum activity against Gram-positive and Gram-negative aerobic bacteria. Ceftazidime pentahydrate is also active against Enterobacteriaceae (including β-lactamase-positive strains) and is resistant to hydrolysis by most β-lactamases[1].

IC_{50} & Target

β-lactam

In Vitro

Ceftazidime (0-8 μg/mL approximately, 24 h) pentahydrate displays antibacterial and anti-biofilm activities against P. aeruginosa strains[2].

Ceftazidime (0-40 μg/mL approximately, 18-20 h) pentahydrate has inhibitory activities against S. maltophilia isolates[3].

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

Cell Viability Assay[2]

Cell Line:	P. aeruginosa strains (PAO1, PA1, PA2)
Concentration:	0-8 μg/mL approximately
Incubation Time:	24 h
Result:	Displayed antibacterial and anti-biofilm activities with MIC values of 2-4 μg/mL.

In Vivo

Ceftazidime (2 h infusion of injection, 2 000 mg, every 8 h for 24 h) pentahydrate moderately reduces bacterial density in a murine thigh infection model[4].

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

Animal Model:	Murine thigh infection model[4]
Dosage:	2000 mg
Administration:	2 h infusion of injection, every 8 h for 24 h.
Result:	Reduced bacterial density against the isogenic NDM (New Delhi metallo-β-lactamase) strain.

CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- Adv Sci (Weinh). 2020 Jul 21;7(17):2001374.
- Int J Antimicrob Agents. 2018 Aug;52(2):269-271.
- Biomed Pharmacother. 2023 Nov 8:115856.
- Pharmaceutics. 2023 Nov 30, 15(12), 2705.

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REFERENCES

[1]. Esmat Kamali, et al. In vitro activities of cellulase and ceftazidime, alone and in combination against Pseudomonas aeruginosa biofilms. BMC Microbiol. 2021 Dec 16;21(1):347.

[2]. Qiuxia Lin, et al. Avibactam potentiated the activity of both ceftazidime and aztreonam against S. maltophilia clinical isolates in vitro. BMC Microbiol. 2021 Feb 22;21(1):60.

[3]. Shawn H MacVane, et al. Unexpected in vivo activity of ceftazidime alone and in combination with avibactam against New Delhi metallo-β-lactamase-producing Enterobacteriaceae in a murine thigh infection model. Antimicrob Agents Chemother. 2014 Nov;58(11):7007-9.

[4]. Richards DM, et al. Ceftazidime. A review of its antibacterial activity, pharmacokinetic properties and therapeutic use. Drugs. 1985 Feb;29(2):105-61.

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

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