Ceftazidime

Cat. No.: HY-B0593

CAS No.: 72558-82-8

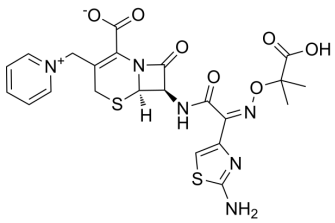
Molecular Formula: $C_{22}H_{22}N_6O_7S_2$

Molecular Weight: 546.58

Target: Bacterial; Antibiotic; Beta-lactamase

Pathway: Anti-infection

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



SOLVENT & SOLUBILITY

In Vitro

H_2O : 100 mg/mL (182.96 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.8296 mL	9.1478 mL	18.2956 mL
	5 mM	0.3659 mL	1.8296 mL	3.6591 mL
	10 mM	0.1830 mL	0.9148 mL	1.8296 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 (182.96 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (3.81 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (3.81 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (3.81 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Ceftazidime (GR20263), an antibiotic, has a broad spectrum activity against Gram-positive and Gram-negative aerobic bacteria. Ceftazidime 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) displays antibacterial and anti-biofilm activities against P. aeruginosa strains[2]

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Ceftazidime (0-40 μg/mL approximately, 18-20 h) 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) 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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