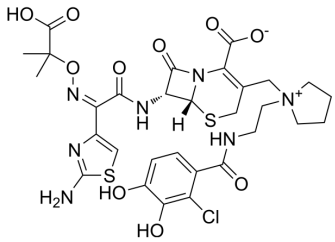
Cefiderocol

Cat. No.:	HY-17628
CAS No.:	1225208-94-5
Molecular Formula:	$C_{30}H_{34}ClN_7O_{10}S_2$
Molecular Weight:	752.21
Target:	Bacterial; Antibiotic
Pathway:	Anti-infection
Storage:	-20°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

DMSO : ≥ 125 mg/mL (166.18 mM)

H_2O : 1.06 mg/mL (1.41 mM; Need ultrasonic)

* "≥" means soluble, but saturation unknown.

	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
Preparing Stock Solutions	**1 mM**	1.3294 mL	6.6471 mL	13.2942 mL
	5 mM	0.2659 mL	1.3294 mL	2.6588 mL
	10 mM	0.1329 mL	0.6647 mL	1.3294 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: ≥ 2.75 mg/mL (3.66 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.75 mg/mL (3.66 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.75 mg/mL (3.66 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Cefiderocol (S-649266) is a siderophore cephalosporin which has a potent activity against a broad range of aerobic Gram-negative bacterial species with MIC_{50}s of 2 µg/mL or less.

IC_{50} & Target

β-lactam

In Vitro

Cefiderocol (S-649266), a novel parenteral siderophore cephalosporin conjugated with a catechol moiety, has a characteristic antibacterial spectrum with a potent activity against a broad range of aerobic Gram-negative bacterial

species, including carbapenem-resistant strains of Enterobacteriaceae and nonfermenting bacteria such as Pseudomonas aeruginosa and Acinetobacter baumannii. Cefiderocol has affinity mainly for PBP3 of Enterobacteriaceae and nonfermenting bacteria similar to that of GR20263. A deficiency of the iron transporter PiuA in P. aeruginosa or both CirA and Fiu in Escherichia coli can cause 16-fold increases in cefiderocol MICs, suggesting that these iron transporters contribute to the permeation of cefiderocol across the outer membrane. The deficiency of OmpK35/36 in Klebsiella pneumoniae and the overproduction of efflux pump MexA-MexB-OprM in P. aeruginosa show no significant impact on the activity of cefiderocol[1].

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

PROTOCOL

Cell Assay [1]

For the determination of cefiderocol MIC, iron-depleted cation-adjusted Mueller-Hinton broth (ID-CAMHB) is prepared, except for the cases that are required to determine MICs under specific conditions. The quality control MIC ranges of cefiderocol are 0.06 to 0.5 μg/mL for both ***E. coli*** ATCC 25922 and ***P. aeruginosa*** ATCC 27853. For anaerobic bacteria, brucella agar supplemented with hemin, vitamin K1, and laked sheep blood is used[1].

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

CUSTOMER VALIDATION

- Clin Microbiol Infect. 2022 Dec 29;S1198-743X(22)00645-0.
- J Infect Public Health. 2023 Nov 7:S1876-0341(23)00390-8.
- Front Microbiol. 03 January 2022.
- Bioorg Chem. 2020 Jan;95:103550.
- Antimicrob Agents Chemother. 2024 Jan 30:e0112023.

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REFERENCES

[1]. Ito A, et al. In Vitro Antibacterial Properties of Cefiderocol, a Novel Siderophore Cephalosporin, against Gram-Negative Bacteria. Antimicrob Agents Chemother. 2017 Dec 21;62(1).

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