

Product Data Sheet

Product Name: Cefiderocol (S-649266)

Cat. No.: GC32079

Chemical Properties

Cas. No. 1225208-94-5

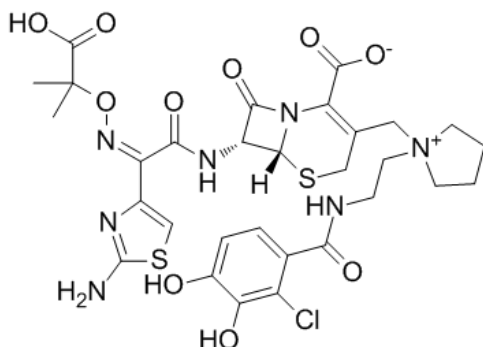
SMILES O=C(C(N12)=C(C[N+]3(CCNC(C4=CC=C(O)C(O)=C4Cl)=O)CCCC3)CS[C@]2([H])[C@H](NC(/C(C5=CSC(N)=N5)=N\OC(C)(C(O)=O)C)=O)C1=O)[O-]

Formula $C_{30}H_{34}ClN_7O_{10}S_2$ M.Wt 752.21

Solubility DMSO : 50 mg/mL (66.47 mM) Storage Store at -20°C, stored under nitrogen, unstable in solution, ready to use.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines Peripheral blood mononuclear cells (PBMCs)

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

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Preparation Method Cells were stimulated with 100 ng/mL LPS with or without cefiderocol (10 mg/L, 40 mg/L, 70 mg/L) for 3 days

Reaction Conditions 10/40/70 mg/L; 3 days

Applications Higher concentrations of cefiderocol inhibit the production of lipopolysaccharide-stimulated proinflammatory cytokines.

Animal experiment [2]:

Animal models Pathogen-free male Sprague-Dawley rats

Preparation Method Inoculants of 0.1 ml (*Pseudomonas aeruginosa*) or 0.2 ml (*Pseudomonas baumannii* or *Klebsiella pneumoniae*) were injected into the lungs of rats to induce respiratory infection. The infected rats were given cefiderocol subcutaneously.

Dosage form 2 g every 8 h as a 3-h infusion for 4 days

Applications Administering cefiderocol 2 g every 8 h as a 3-h infusion for 4 days achieved a greater than 3 log₁₀ reduction in cells of carbapenem-resistant isolates of *P. aeruginosa*, *A. baumannii*, and *K. pneumoniae* in rat lung infection.

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References:

- [1]. Hildebrand D, Böhlinger J, et.al. Cefiderocol Protects against Cytokine- and Endotoxin-Induced Disruption of Vascular Endothelial Cell Integrity in an In Vitro Experimental Model. *Antibiotics* (Basel). 2022 Apr 26;11(5):581. doi: 10.3390/antibiotics11050581. PMID: 35625225; PMCID: PMC9137736.
- [2]. Matsumoto S, Singley CM, et.al. Efficacy of Cefiderocol against Carbapenem-Resistant Gram-Negative Bacilli in Immunocompetent-Rat Respiratory Tract Infection Models Recreating Human Plasma Pharmacokinetics. *Antimicrob Agents Chemother*. 2017 Aug 24;61(9):e00700-17. doi: 10.1128/AAC.00700-17. PMID: 28630178; PMCID: PMC5571323.

Background

Cefiderocol is a new type of iron carrier cephalosporin with strong in vitro activity against Gram-negative bacteria and non-fermented Gram-negative bacteria[1-3].

Cefiderocol(10/40/70 mg/L;3 days) dampens LPS-stimulated production of pro-inflammatory cytokines[4]. The absence of iron transporters PiuA in *Pseudomonas aeruginosa* or CirA and Fiu in *Escherichia coli* resulted in a 16-fold increase in cefiderocol MIC, suggesting that these iron transporters contribute to cefiderocol penetration through the outer membrane[5].

Administering cefiderocol 2 g every 8 h as a 3-h infusion for 4 days achieved a greater than 3 log₁₀ reduction in cells of carbapenem-resistant isolates of *P. aeruginosa*, *A. baumannii*, and *K. pneumoniae* in rat lung infection[6]. The pharmacodynamics of cefiderocol in the thigh infection model of neutropenia mice showed a sigmoid dose-response curve, and the bactericidal effect was better with the increase of dose[7].

References:

- [1]. Choi JJ, McCarthy MW. Cefiderocol: a novel siderophore cephalosporin. *Expert Opin Investig Drugs*. 2018 Feb;27(2):193-197. doi: 10.1080/13543784.2018.1426745. Epub 2018 Jan 24. PMID: 29318906.
- [2]. Soriano MC, Montufar J, et.al. Cefiderocol. *Rev Esp Quimioter*. 2022 Apr;35 Suppl 1(Suppl 1):31-34. doi: 10.37201/req/s01.07.2022. Epub 2022 Apr 22. PMID: 35488822; PMCID: PMC9106201.
- [3]. Gijón Cordero D, Castillo-Polo JA, et.al. Antibacterial spectrum of cefiderocol. *Rev Esp Quimioter*. 2022 Sep;35 Suppl 2(Suppl 2):20-27. doi: 10.37201/req/s02.03.2022. Epub 2022 Oct 4.

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PMID: 36193981; PMCID: PMC9632062.

[4]. Hildebrand D, BÖhringer J, et.al. Cefiderocol Protects against Cytokine- and Endotoxin-Induced Disruption of Vascular Endothelial Cell Integrity in an In Vitro Experimental Model. *Antibiotics (Basel)*. 2022 Apr 26;11(5):581. doi: 10.3390/antibiotics11050581. PMID: 35625225; PMCID: PMC9137736.

[5]. Ito A, Sato T, et.al. In Vitro Antibacterial Properties of Cefiderocol, a Novel Siderophore Cephalosporin, against Gram-Negative Bacteria. *Antimicrob Agents Chemother*. 2017 Dec 21;62(1):e01454-17. doi: 10.1128/AAC.01454-17. PMID: 29061741; PMCID: PMC5740388.

[6]. Matsumoto S, Singley CM, et.al. Efficacy of Cefiderocol against Carbapenem-Resistant Gram-Negative Bacilli in Immunocompetent-Rat Respiratory Tract Infection Models Recreating Human Plasma Pharmacokinetics. *Antimicrob Agents Chemother*. 2017 Aug 24;61(9):e00700-17. doi: 10.1128/AAC.00700-17. PMID: 28630178; PMCID: PMC5571323.

[7]. Ghazi IM, Monogue ML, et.al. Pharmacodynamics of cefiderocol, a novel siderophore cephalosporin, in a *Pseudomonas aeruginosa* neutropenic murine thigh model. *Int J Antimicrob Agents*. 2018 Feb;51(2):206-212. doi: 10.1016/j.ijantimicag.2017.10.008. Epub 2017 Oct 27. PMID: 29111435.

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