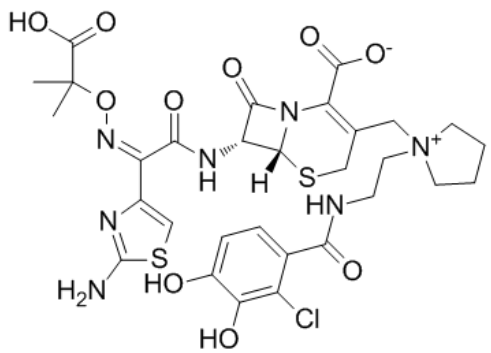
Product Data Sheet

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)

Product Data Sheet

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.

Caution: Product has not been fully validated for medical applications. For research use only.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

References:

[1]. 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.
[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.

Product Data Sheet

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.

Caution: Product has not been fully validated for medical applications. For research use only.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA