Product Data Sheet

Product Name: Avibactam sodium hydrate
Cat. No.: GC35438

Chemical Properties

Cas. No.	2938989-90-1		
SMILES	O=S(ON1[C@]2([H])CC[C@@H](C(N)=O)[N@@](C2)C1=O)([O-])=O.O.[Na+]		
Formula	$C_7H_{12}N_3NaO_7S$	M.Wt	305.24
Solubility	Water: ≥ 200 mg/mL (655.22 mM)	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	Avibactam sodium hydrate		

Protocol

Cell experiment: Cells (~109 cfu) from overnight broth culture are spread on Mueller-Hinton agar supplemented with either (i) Ceftaroline plus Avibactam (1 or 4 mg/L) at 1-16× the MICs or (ii) Ceftaroline at 1 or 4 mg/L plus Avibactam at 1-8× the concentration needed to reduce the Ceftaroline MIC to 1 or 4 mg/L. Colonies are counted after overnight incubation and representatives are retained[2].

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Animal experiment:	Mice[3]Avibactam is reconstituted in sterile water to a stock solution of 5,120 mg/L and further solution is prepared in Mueller-Hinton broth. Outbred female CD-1 mice, 7 to 8 weeks old and weighing 20 to 25 g, are used in the experiments. Eight dose combinations are used. For the thigh-infected animals, the combinations of GR20263 and Avibactam are 16/4, 8/1, 64/32, and 2/128 mg/kg. For the lung-infected mice, combinations of 32/16, 4/2, 128/8, and 1/64 mg/kg of the respective constituents are used. These combinations are chosen in order to detect possible pharmacokinetic interactions between the two compounds (GR20263 and Avibactam) and to cover a wide range of doses of each compound.

References:

[1]. Ehmann DE, et al. Avibactam is a covalent, reversible, non-β-lactam β-lactamase inhibitor. Proc Natl Acad Sci U S A. 2012 Jul 17;109(29):11663-8.
[2]. Livermore DM, et al. Characterization of β-lactamase and porin mutants of Enterobacteriaceae selected with ceftaroline + avibactam

(NXL104). J Antimicrob Chemother. 2012 Jun;67(6):1354-8.
[3]. Berkhout J, et al. Pharmacokinetics and penetration of GR20263 and avibactam into epithelial lining fluid in thigh- and lung-infected mice. Antimicrob Agents Chemother. 2015 Apr;59(4):2299-304.

Background

Avibactam (AVE-1330A, NXL104) is a covalent, reversible, non-β-lactam β-lactamase inhibitor with IC50 values of 8, 80, and 38 nM for TEM-1, P99, and KPC-2 β-lactamases, respectively.

Avibactam (formerly NXL104, AVE1330A) is a synthetic non-β-lactam, β-lactamase inhibitor inhibits the activities of Ambler class A and C β-lactamases and some Ambler class D enzymes[1]. Avibactam has an unusual mechanism of action: it is a covalent inhibitor that acts via ring opening, but in contrast to other currently used β-lactamase inhibitors, this reaction is reversible[2].

[1] Zhanel GG, et al. Drugs. 2013, 73(2):159-77. [2] Lahiri SD, et al. Antimicrob Agents Chemother. 2014, 58(10):5704-13.

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