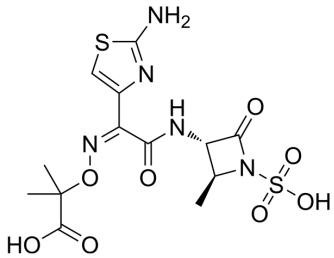
Aztreonam

Cat. No.:	HY-B0129
CAS No.:	78110-38-0
Molecular Formula:	$C_{13}H_{17}N_5O_8S_2$
Molecular Weight:	435.43
Target:	Bacterial; Antibiotic; Penicillin-binding protein (PBP)
Pathway:	Anti-infection
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 2 years -20°C 1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (114.83 mM; Need ultrasonic)
H_2O : 10 mg/mL (22.97 mM; Need ultrasonic)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.2966 mL	11.4828 mL	22.9657 mL
	5 mM	0.4593 mL	2.2966 mL	4.5931 mL
	10 mM	0.2297 mL	1.1483 mL	2.2966 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 10 mg/mL (22.97 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (5.74 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (5.74 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (5.74 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Aztreonam (SQ-26,776) is a synthetic monocyclic beta-lactam antibiotic, which has a very high affinity for penicillin-binding protein 3 (PBP-3).

IC_{50} & Target

β-lactam

In Vitro	Aztreonam (SQ-26,776) is a synthetic monocyclic beta-lactam antibiotic (a monobactam), with the nucleus based on a simpler monobactam isolated from Chromobacterium violaceum. It was approved by the U.S. Food and Drug Administration in 1986. It is resistant to some beta-lactamases, but is inactivated by extended-spectrum beta-lactamases. Aztreonam has no useful activity against gram-positive or anaerobic microorganisms[1]. Aztreonam (SQ-26) is similar in action to penicillin. It inhibits mucopeptide synthesis in the bacterial cell wall, thereby blocking peptidogly can crosslinking. It has a very high affinity for penicillin-binding protein 3 (PBP-3) and mild affinity for PBP-1a. Aztreonam (SQ-26) binds the penicillin-binding proteins of gram-positive and anaerobic bacteria very poorly and is largely ineffective against them. Aztreonam (SQ-26) is bactericidal but less so than some of the cephalosporins[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell. 2024 Feb 15;187(4):882-896.e17
- Nat Commun. 2022 Mar 2;13(1):1116.
- Pharmaceutics. 2023 Nov 30, 15(12), 2705.
- Antimicrob Agents Chemother. 2018 Jul 27;62(8). pii: e00414-18.
- Antibiotics (Basel). 2021, 10(11), 1341.

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REFERENCES

[1]. Kobayashi Y, et al. Synergy with aztreonam and arbekacin or tobramycin against Pseudomonas aeruginosa isolated from blood. J Antimicrob Chemother. 1992 Dec;30(6):871-2.

[2]. Guay DR, et al. Aztreonam, a new monobactam antimicrobial. Clin Pharm. 1985 Sep-Oct;4(5):516-26.

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

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