



Product Information

Aztreonam

Product Number **A 6848**
Store at Room Temperature

Product Description

Molecular Formula: $C_{13}H_{17}N_5O_8S_2$
Molecular Weight: 435.4
CAS Number: 78110-38-0
Melting Point: 227 °C (with decomposition)¹
Synonyms: [2S-[2 α ,3 β (Z)]]-2-[[[1-(2-amino-4-thiazolyl)-2-[(2-methyl-4-oxo-1-sulfo-3-azetidyl)amino]-2-oxoethylidene]amino]oxy]2-methylpropanoic acid, azthreonam

Aztreonam is the first completely synthetic monobactam antibiotic. It possesses a high level of resistance to β -lactamases and has a relatively narrow spectrum of antibacterial activity, particularly against Gram-negative aerobic organisms. Aztreonam specifically targets the penicillin binding protein 3 (PBP-3) of Gram-negative bacteria. It is also effective against such Enterobacteriaceae as *E. coli*, *Klebsiella*, *Proteus*, *Providencia*, *Salmonella*, *Serratia*, *Shigella*, and *Yersinia* species.^{1,2}

The susceptibility of various *Plesiomonas shigelloides* strains to a range of antibiotics, including aztreonam, has been investigated.³ A comparative pharmacodynamics study on the effects of aztreonam and tigemonam against *Escherichia coli* and *Klebsiella pneumoniae* both *in vitro* and *in vivo* has been published.⁴

Aztreonam and other α -lactam antibiotics have been used in a study of TNF- α and inducible nitric oxide synthase (iNOS) production from mouse peritoneal macrophages following co-culture with *E. coli* or *Staphylococcus aureus* bacteria.⁵ The inhibition of PBP-3 by aztreonam has been utilized to probe the structural localization of penicillin-binding protein 2 (PBP-2) in *E. coli*.⁶

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in dimethylformamide:methanol (1:1, 50 mg/ml), yielding a clear to slightly hazy, colorless solution.

References

1. The Merck Index, 12th ed., Entry# 955.
2. Martindale The Extra Pharmacopoeia, 31st ed., Reynolds, J. E. F., ed., Royal Pharmaceutical Society (London, UK: 1996), pp. 176-177.
3. Stock, I., and Wiedemann, B., Natural antimicrobial susceptibilities of *Plesiomonas shigelloides* strains. *J. Antimicrob. Chemother.*, **48(6)**, 803-811 (2001).
4. van Ogtrop, M. L., et al., Comparison of the effects of aztreonam and tigemonam against *Escherichia coli* and *Klebsiella pneumoniae in vitro* and *in vivo*. *Antimicrob. Agents Chemother.*, **35(3)**, 417-422 (1991).
5. Cui, W., et al., Differential modulation of the induction of inflammatory mediators by antibiotics in mouse macrophages in response to viable Gram-positive and Gram-negative bacteria. *J. Endotoxin Res.*, **9(4)**, 225-236 (2003).
6. Den Blaauwen, T., et al., Penicillin-binding protein PBP2 of *Escherichia coli* localizes preferentially in the lateral wall and at mid-cell in comparison with the old cell pole. *Mol. Microbiol.*, **47(2)**, 539-547 (2003).

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