



Cefotaxime Sodium, USP PRODUCT DATA SHEET

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Product Name:	Cefotaxime Sodium, USP
Product Number:	C011
CAS Number:	64485-93-4
Molecular Formula:	$C_{16}H_{16}N_5NaO_7S_2$
Molecular Weight:	447.45
Form:	Powder
Appearance:	White or almost white powder
Source:	Semi-synthetic (<i>Acremonium sp.</i>)
Absorbance:	$A_{430} \leq 0.2$
pH:	4.5-6.5
Optical Rotation:	+58° to +64°
Storage Conditions:	-20°C
Description:	Cefotaxime Sodium, USP is broad-spectrum, third-generation cephalosporin. It interferes with bacterial peptidoglycan synthesis. Cefotaxime Sodium is freely soluble in aqueous solution.

We also offer:

- Cefotaxime Sodium, USP ([C011](#))

Cefotaxime Sodium, USP conforms to United States Pharmacopoeia specifications.

Mechanism of Action: Like β -lactams, cephalosporins interfere with PBP (penicillin binding protein) activity involved in the final phase of peptidoglycan synthesis. PBP's are enzymes which catalyze a pentaglycine crosslink between alanine and lysine residues providing additional strength to the cell wall. Without a pentaglycine crosslink, the integrity of the cell wall is severely compromised and ultimately leads to cell lysis and death. Resistance to cephalosporins is commonly due to cells containing plasmid encoded β -lactamases. Cefotaxime Sodium however, is largely resistant to β -lactamases.

Spectrum: Cefotaxime Sodium has broad-spectrum activity against a wide variety of Gram-positive and Gram-negative bacteria. However, unlike many cephalosporin antibiotics, cefotaxime sodium is not effective against *Pseudomonas aeruginosa*.

Microbiology Applications Cefotaxime Sodium is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against Gram-positive and Gram-negative microbial isolates. Medical microbiologists use AST results to recommend antibiotic treatment options. Representative MIC values include:

- *Neisseria gonorrhoeae* 0.008 µg/mL – 0.03 µg/mL
- *Streptococcus pneumoniae* ≤0.007 µg/mL – 0.25 µg/mL
- For a complete list of Cefotaxime MIC values, [click here](#).

Plant Biology Applications

Cefotaxime is often used in *Agrobacterium tumefaciens* mediated transformations to combat bacterial growth. It is also sometimes used in combination with Vancomycin as it has a synergistic effect.

References:

General:

Georgopapadakou NH (1992) Mechanisms of action of cephalosporin 3'-quinolone esters, carbamates, and tertiary amines in *Escherichia coli*. *Antimicrob. Agents. Chemother.* 37(3): 559-65

Mathias RJ and Boyd LA (1986) Cefotaxime stimulates callus growth, embryogenesis and regeneration in hexaploid bread wheat (*Triticum aestivum* L. em Thell). *Plant Sci.* 46:217-223

Cefotaxime Sodium from TOKU-E:

Ferrer-González E, Kaul M, Parhi AK, LaVoie EJ and Pilch DS (2017) Lactam antibiotics with a high affinity for PBP2 act synergistically with the FtsZ-targeting agent TXA707 against methicillin-resistant *Staphylococcus aureus*. *Antimicrob. Agents Chemother.* 61(9):e00863-17

Lefurgy ST et al (2016) Analysis of the structure and function of FOX-4 cephamycinase. *Antimicrob. Agents. Chemother.* 60 (2):717-728

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