

Product Name:	Cephalothin sodium, USP
Product Number:	C026
CAS Number:	58-71-9
Molecular Formula:	$C_{16}H_{15}N_2NaO_6S_2$
Molecular Weight:	418.42
Form:	Powder
Appearance:	White or almost white crystalline powder
Solubility:	freely soluble in aqueous solution (50 mg/mL)
Source:	Semi-synthetic
pH:	4.5-7.0 (250 mg/mL)
Optical Rotation:	+124° to +134°
Storage Conditions:	-20°C
Description:	Cephalothin sodium, USP is a semisynthetic, beta-lactam, first generation cephalosporin antibiotic with bactericidal activity. It is effective against Gram-positive and Gram-negative bacteria. Cephalothin sodium is inactivated by cephalosporinase. The compound is freely soluble in aqueous solution (50 mg/mL).
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.
Spectrum:	Cephalothin sodium is a broad spectrum cephalosporin targeting a wide variety of Gram-positive and Gram-negative bacteria especially those which cause respiratory and skin infections.

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

- *Escherichia coli* 0.78 µg/mL - >128 µg/mL
- *Staphylococcus aureus* 0.25 µg/mL - >23.9 µg/mL
- For a complete list of cephalothin MIC values, [click here](#).

Media Supplements

Cephalothin can be used as a selective agent in several types of isolation media:

Columbia Blood Agar - *Campylobacter* selective supplement (Blaser-Wang)

References:

Cho H and Kim K (2018) *Escherichia coli* OxyS RNA triggers cephalothin resistance by modulating the expression of CRP-associated genes. *Biochem. Biophys. Res. Comm* 506(1):66-72 PMID 30340824

Georgopapadakou, NH (1992) Mechanisms of Action of Cephalosporin 3'-quinolone Esters, Carbamates, and Tertiary Amines in *Escherichia coli*. *Antimicrob. Agents Chemother.* 37(3): 559-565

Nagami K, Maki E (1993) *In vitro* cytotoxicity test for estimating non-ocular irritation dose of ophthalmic solutions. *Cell Biol and Toxicol* 9(2):107-118 PMID 8242427

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