

Product Name:	Cefpirome Sulfate
Product Number:	C014
CAS Number:	98753-19-6
Molecular Formula:	$C_{22}H_{22}N_6O_5S_2H_2SO_4$
Molecular Weight:	612.66
Form:	Powder
Appearance:	White or almost white crystalline powder
Solubility:	slightly soluble in DMSO (1 mg/ml)
Source:	semi-synthetic
Water Content (Karl Fischer):	$\leq 4.0\%$
pH:	(2% in H_2O): 1.3-2.5
Storage Conditions:	$-20^{\circ}C$

Description: Cefpirome Sulfate is the sulfate salt of Cefpirome, a semisynthetic, broad-spectrum, fourth-generation cephalosporin antibiotic that inhibits bacterial cell wall synthesis. Cefpirome is a β -lactam antibiotic consisting of a β -lactam ring bound to a dihydrothiazine ring. This two-ring system distorts the β -lactam amide bond, resulting in increased reactivity. Cefpirome Sulfate is slightly soluble in DMSO.

We also offer:

- Cefpirome Sulfate solubilized ([C055](#))

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.

The relative lack of cross-resistance between Cefpirome and the third generation cephalosporins suggests a slightly different mechanism of action of Cefpirome in comparison to the other cephalosporins. Due to its compact dipolar structure, Cefpirome can penetrate Gram-negative bacteria more quickly than the other agents (Nikaido et al, 1990)

Spectrum: Cefpirome is a broad-spectrum antibiotic targeting a wide variety of Gram-positive and Gram-negative bacteria. A relatively low affinity of Cefpirome for lactamases is considered to be one of the reasons for its high antimicrobial activity against such enzyme-producing strains (Nikaido et al, 1990). Many *Bacteroides*, *Enterococci*, and *Haemophilus* species have developed resistance to Cefpirome.

Microbiology Applications Cefpirome sulfate 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 for infected patients. Representative MIC values include:
Campylobacter jejuni 0.5 µg/mL – 8 µg/mL
Klebsiella pneumoniae 0.032 µg/mL – 0.125 µg/mL
For a representative list of Cefpirome MIC values, [click here](#).

Cancer Applications Cefpirome was found to be more effective than ceftazidime, aztreonam, timentin, and piperacillin against nosocomially important isolates from cancer patients during *in vitro* examination of 253 bacterial isolates (Rolston et al, 1986).

References: Reference for TOKU-E product:

Cefpirome Sulfate was used in a study by **Spinler J.K. et al.** : [Discerning strain-specific β-lactam drug resistance by clonal isolates of multi-drug resistant Pseudomonas aeruginosa using selected reaction monitoring](#)

References:

Hafeez S, Izhar M, Ahmed A, Zafar A, and Naeem M (2000) *In vitro* antimicrobial activity of Cefpirome: a new fourth-generation cephalosporin against clinically significant bacteria. J. Pak. Med. Assoc. 50(8):250-252 PMID 10992706

Kobayashi S, Arai S, Hayashi S and Fujimoto K (1986) β-Lactamase Stability of Cefpirome (HR 810), a new cephalosporin with a broad antimicrobial spectrum. Antimicrob. Agents Chemother. 30(5):713-718 PMID 3492175

Nikaido H, Liu W and Rosenberg EY (1990) Outer membrane permeability and beta-lactamase stability of dipolar ionic cephalosporins containing methoxyimino substituents. Antimicrob. Agents Chemother. 34(2):337-342 PMID 2109581

Rolston KVI, Alvarez ME, Hsu K, and Bodey GP (1986) *In-vitro* activity of Cefpirome (HR-810), WIN-49375, BMY-28142 and other antibiotics against nosocomially important isolates from cancer patients, J. Antimicrob. Chemother. 17(4):453–457

Rolston K et al (1986) Comparative *in vitro* activity of Cefpirome and other antimicrobial agents against isolates from cancer patients. Chemother. 32(4):344-351