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| Product Name: | Cefepime Hydrochloride |
| Product Number: | C009 |
| CAS Number: | 123171-59-5 |
| Molecular Formula: | $C_{19}H_{25}ClN_6O_5S_2 \cdot HCl \cdot H_2O$ |
| Molecular Weight: | 571.50 |
| Form: | Powder |
| Appearance: | White or almost white crystalline powder |
| Solubility: | soluble in aqueous solution |
| Source: | Semi-synthetic |
| Water Content (Karl Fischer): | 3.0-6.0% |
| Absorbance: | $A_{400} \leq 0.2$ |
| Storage Conditions: | -20°C. Protect from light. |
| Description: | <p>Cefepime Hydrochloride is a broad-spectrum, fourth-generation cephalosporin antibiotic. It is commonly used in antimicrobial susceptibility testing. The addition of the hydrochloride salt enhances aqueous solubility. Cefepime has potential for use as an antitumor agent, showing inhibition of human breast cancer cells <i>in vitro</i> when complexed with manganese.</p> <p>We also offer:</p> <ul style="list-style-type: none">• Cefepime (C008) |
| Mechanism of Action: | <p>Like β-lactams, cephalosporins interfere with penicillin binding protein (PBP) 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. Interestingly, Cefepime is resistant to various β-lactamases encoded by otherwise resistant β-lactam bacteria strains.</p> |
| Spectrum: | <p>Cefepime is a broad-spectrum antibiotic targeting a wide variety of naturally antibiotic resistant Gram-positive and Gram-negative bacteria. Some of these naturally resistant bacteria include <i>Pseudomonas aeruginosa</i>, <i>Staphylococcus aureus</i>, and <i>Streptococcus pneumoniae</i>.</p> |

Microbiology Applications Cefepime Hydrochloride 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:

- *Pseudomonas aeruginosa* 32 µg/mL – 256 µg/mL
- *Staphylococcus aureus* 2 µg/mL – 16 µg/mL
- For a more complete list of cefepime MIC values, [click here](#).

Cefepime was used in a MALDI-TOF MS-based direct-on-target microdroplet growth assay as part of a screening panel for rapid detection of ESBL, and AmpC β-Lactamases in *Enterobacterales*. (Correa-Martinez et al, 2019).

References:

Georgopapadakou NH and Bertasso A (1993) Mechanisms of action of Cephalosporin 3'-quinolone esters, carbamates, and tertiary amines in *Escherichia coli*. *Antimicrob. Agents. Chemother.* 37(3):559-565

Zhang Z, Bi C, Fan Y, Wang H and Bao Y (2015) Cefepime, a fourth-generation cephalosporin, in complex with manganese, inhibits proteasome activity and induces the apoptosis of human breast cancer cells. *Int. J. Molec. Med.* 36(4): 1143-1150

Cefepime from TOKU-E:

Correa-Martinez C, Idelevich EA, Sparbier K, Kostrzewa M, and Becker K (2019) Rapid detection of extended-spectrum B-lactamases (ESBL) and AmpC B-Lactamases in *Enterobacterales*: Development of a screening panel using the MALDI-TOF MS-based direct-on-target microdroplet growth assay. *Front. Microbiol.* 10:13 PMID 30733710

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