

Product Name:	Piperacillin Sodium
Product Number:	P010
CAS Number:	59703-84-3
Molecular Formula:	$C_{23}H_{26}N_5NaO_7S$
Molecular Weight:	539.54
Form:	Powder
Appearance:	White or off-white powder
Solubility:	Freely soluble in aqueous solution
Source:	semi-synthetic
Water Content (Karl Fischer):	$\leq 1.0\%$
pH:	5.5 to 7.5
Storage Conditions:	2-8 C
Description:	<p>Piperacillin Sodium is the sodium salt form of Piperacillin, a semi-synthetic, extended spectrum fungistatic β-lactam fourth-generation ureidopenicillin. Derived from Ampicillin, Piperacillin was developed by Toyama Chemical Co, Tokyo, Japan. It can also be used to study multidrug resistance. Piperacillin is freely soluble in aqueous solution.</p> <p>We also offer:</p> <ul style="list-style-type: none">• Piperacillin (P017)
Mechanism of Action:	<p>β-lactams 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 β-lactams is commonly due to cells containing plasmid encoded β-lactamases.</p>
Spectrum:	<p>Piperacillin is a broad-spectrum antibiotic targeting a wide range of susceptible Gram-positive and Gram-negative bacteria. It targets both aerobic and anaerobic bacteria. It can be used against <i>Enterococcus</i> species, <i>Pseudomonas aeruginosa</i>, and <i>E. coli</i>.</p>

Microbiology Applications Piperacillin 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 ranges include:

- *Neisseria* spp. 0.015 µg/mL – 32 µg/mL
- *Bacteroides fragilis* 0.25 µg/mL - 32 µg/mL

For a representative e list of Piperacillin MIC values, [click here](#).

Plant Biology Applications

In vitro antibacterial activity of Piperacillin against *Agrobacterium tumefaciens* strains LBA4404 and EHA101 was examined and found to be effective in eliminating the bacteria involved in *Agrobacterium*-mediated plant genetic transformation (Ogawa and Mii, 2004).

References:

Ida K, Hirata S, Nakamuta S and Koike M (1978) Inhibition of cell division of *Escherichia coli* by a new synthetic penicillin, Piperacillin. Antimicrob. Agents. Chemother. 14 (2) 257-266

Pitout JD, Sanders CC, Sanders WE (1997) Antimicrobial resistance with focus on beta-lactam resistance in gram-negative bacilli. Am. J. Med. 103:51

Karlowsky J et al (2003) Comparison of four antimicrobial susceptibility testing methods to determine the *in vitro* activities of Piperacillin and Piperacillin-Tazobactam against clinical isolates of *Enterobacteriaceae* and *Pseudomonas aeruginosa*. *J. Clin. Microbiol* 41(7):3339-3343

If you need any help, contact us: info@toku-e.com. Find more information on: www.toku-e.com/