

<b>Product Name:</b>	Meropenem with sodium carbonate
<b>Product Number:</b>	M028
<b>Molecular Formula:</b>	$C_{17}H_{25}N_3O_5S \cdot Na_2CO_3$
<b>Molecular Weight:</b>	466.46
<b>Form:</b>	Powder
<b>Appearance:</b>	White or almost white powder
<b>Solubility:</b>	very soluble in water (112 mg/ml)
<b>pH:</b>	7.3 - 8.3
<b>Storage Conditions:</b>	2-8°C
<b>Description:</b>	<p>Meropenem with sodium carbonate is a salt form of Meropenem, which is a <math>\beta</math>-lactam antibiotic in the carbapenem class, which targets the bacterial cell wall. Meropenem has found utility against extended spectrum <math>\beta</math>-lactamase (ESBL) producing <i>Enterobacteriaceae</i> that are resistant to many <math>\beta</math>-lactam antibiotics and certain cephalosporins. Meropenem with sodium carbonate is very soluble in water.</p> <p>We also offer:</p> <ul style="list-style-type: none"><li>• Meropenem, USP (<u>M002</u>)</li></ul>
<b>Mechanism of Action:</b>	<p><math>\beta</math>-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 <math>\beta</math>-lactams is commonly due to cells containing plasmid encoded <math>\beta</math>-lactamases. Like many carbapenems, meropenem is highly resistant to the degradative effects of <math>\beta</math>-lactamases.</p>
<b>Spectrum:</b>	<p>Meropenem has a broad spectrum of activity and has been found to be effective against extended spectrum beta-lactamase (ESBL) producing <i>Enterobacteriaceae</i>; a group of pathogenic microbes resistant to many first line beta-lactam antibiotics and certain cephalosporins.</p>

**Microbiology Applications** Meropenem is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against Gram-positive and Gram-negative microbial isolates. Meropenem has also shown high potency against high-resistant superbug strains. Medical microbiologists use AST results to recommend antibiotic treatment options. Representative MIC values include:

- *Staphylococcus epidermidis* 0.06 µg/mL - 16 µg/mL
- *Neisseria meningitis* 0.002 µg/mL – 0.03 µg/mL
- For a complete list of Meropenem MIC values, [click here](#).

## Media Supplements

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

VRE Medium - VRE Selective Supplement

## Plant Biology Applications

Meropenem can be used to suppress the overgrowth of *Agrobacterium* in tobacco, tomato, and rice transformation, with 25 mg/L suppressing outgrowth (Ogawa and Mii , 2007).

Meropenem suppressed growth of *Agrobacterium* during transformation of *Phalaenopsis* at 5 mg/L and had no phytotoxic effect on the cells themselves (Sjahril and Mii, 2005).

## References:

Guzmán F(2008) Beta lactams antibiotics (penicillins and cephalosporins) mechanism of action. *Med. Pharmacol.* Pharmacology Corner, 29 Nov. 2008

Ogawa Ya and Mii M (2007) Meropenem and moxalactam: Novel B-lactam antibiotics for efficient *Agrobacterium*-mediated transformation. 172(3):564-572

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

Sjahril R and Masahiro Mii M (2006) High-efficiency *Agrobacterium*-mediated transformation of *Phalaenopsis* using meropenem, a novel antibiotic to eliminate *Agrobacterium*. *J. Hort. Sci and Biotechnol* 8(3):458-464

Yang Y, Bhachech N and Bush K (1995) Biochemical comparison of imipenem, meropenem and biapenem: Permeability, binding to penicillin-binding proteins, and stability to hydrolysis by β-lactamases. *J. Antimicrob. Chemother.* 35(1):75-84