

Product Name:	Methicillin Sodium
Product Number:	M029
CAS Number:	132-92-3
Molecular Formula:	$C_{17}H_{19}N_2NaO_6S$
Molecular Weight:	402.40
Form:	Powder
Appearance:	White or almost white powder
Solubility:	Acetone: 0.35 mg/mL Ethanol: 40 mg/mL Water: Freely soluble
Source:	Semi-synthetic
Water Content (Karl Fischer):	≤10.0%
Melting Point:	196-197°C (dec.)
Optical Rotation:	+225°
Storage Conditions:	-20°C
Description:	Methicillin Sodium is a narrow spectrum β-lactam antibiotic in the penicillin family and is commonly used as a selective agent in pathogen isolation media, and in antimicrobial susceptibility testing. It is soluble in aqueous solution (0.3 mg/mL).
Mechanism of Action:	β-lactams 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 β-lactams is commonly due to cells containing plasmid encoded β-lactamases. Methicillin is mostly resistant to β-lactamases.
Spectrum:	Methicillin targets primarily the cell wall of Gram-positive organisms especially <i>Staphylococcus aureus</i> .

Microbiology Applications Because of its widespread resistance among medically significant microbes, methicillin may be used as a selective agent in pathogen isolation media to inhibit insignificant microbial background growth.

Methicillin Sodium is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against Gram-positive microbial isolates. Methicillin is particularly used to test MRSA (Methicillin-resistant *Staphylococcus aureus*). Medical microbiologists use AST results to recommend antibiotic treatment options. Representative MIC values include:

- *Staphylococcus aureus* 0.5 µg/mL - 32 µg/mL

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

References:

Joshi SG et al (2010) Control of methicillin-resistant *Staphylococcus aureus* in planktonic form and biofilms: A biocidal efficacy study of nonthermal dielectric-barrier discharge plasma. A. J. Infect. Cont. 38(4):293-301

Kehrenberg C, Cuny C, Strommenger B, Schwarz S, Witte W (2009) Methicillin-resistant and -susceptible *Staphylococcus aureus* strains of clonal lineages ST398 and ST9 from swine carry the multidrug resistance gene cfr. Antimicrob. Agents Chemother. 2009 Feb;53(2):779-81. PMID 19047652

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

Sjöström JE, Löfdahl S, and Philipson L (1975) Transformation reveals a chromosomal locus of the gene(s) for methicillin resistance in *Staphylococcus aureus*. J. Bacteriol. 123 (3):905-915

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