Bacitracin, CulturePure®
PRODUCT DATA SHEET

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Product Name:	Bacitracin, CulturePure®
Product Number:	B014
CAS Number:	1405-87-4
Molecular Formula:	$C_{66}H_{103}N_{17}O_{16}S$
Molecular Weight:	1422.69
Form:	Powder
Appearance:	White to creamy buff powder
Solubility:	freely soluble in aqueous solution.
Source:	*Bacillus subtilis* and *B. licheniformis.*
Potency (on a dry basis):	≥65u/mg
pH:	5.5-7.5
Melting Point:	221-225°C
Storage Conditions:	2-8°C
Description:	Bacitracin is a branched cyclic dodecylpeptide antibiotic produced by *Bacillus licheniformis* and some strains of *Bacillus subtilis* (Azevedo et al 1993). It is synthesized as a mixture of up to 50 closely related congeners/fractions. Bacitracin includes the following fractions: A, A1, B, B1, B2, B3, C, C1, C2, C3, D, E, F, G, H1, H2, H3, I1, I2, I3, and X. Bioactive components include A, B1, B2, and B3. Bacitracin is freely soluble in aqueous solution. During the purification of bacitracin, many peptide precursors are not removed and are detectable in finished commercial products. These peptides have an affinity for cell walls much like bio active bacitracin components. TOKU-E uses liquid column chromatography to separate the impurities from the bioactive components. Each component has been collected and carefully tested for toxicity against routinely used cell lines. Only bioactive, non-toxic fractions are included in Bacitracin, CulturePure. For all Bacitracin products, click here.
Mechanism of Action:	Bacitracin prevents phosphorylation of bactoprenol, a transport protein which carries peptidoglycan components outside the cell membrane. Without the active phosphorylated bactoprenol, peptidoglycan synthesis cannot be completed and the cell lyses. Resistance to Bacitracin is understood to involve two mechanisms: A protein transporter (BcrABC) which pumps bacitracin out of the cell after it has entered, and via another protein (BacA) which provides the active phosphorylated bactoprenol from a different synthetic pathway.
Spectrum:	Bacitracin primarily targets the cell wall in members of the Gram-positive bacteria including *Streptococcus pyogenes* and *Staphylococcus aureus*.

Microbiology Applications

Bacitracin is a useful tool to differentiate between ß-hemolytic, group A Streptococci (*Streptococcus pyogenes*) and ß-hemolytic Streptococococci of other groups.

Bacitracin can be used as a supplement in chocolate agar to facilitate the isolation of *Haemophilus influenzae*. Bacitracin can be used to study the regulatory network in *B. subtilis.* By systematically analyzing the Bacitracin stimulon, authors can pinpoint the loci induced by Bacitracin (Mascher et al 2003).

Bacitracin can be used for gene selection. bacA gene may confer resistance to bacitracin in E coli (Cain et al, 1993)(link: https://www.ncbi.nlm.nih.gov/pubmed/8389741)

Plant Biology Applications

Tobacco hairy roots and cell suspensions were used in plant transformation studies to produce full length murine IgG1 monoclonal antibody. Bacitracin has been shown to prevent degradation of peptides and hormones in plant systems. Treatment with Bacitracin was not sufficient to prevent loss of antibody from the cultures, but improved the growth rates by up to 53%. (Sharp and Doran, 1999).

References:

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