Teicoplanin
PRODUCT DATA SHEET

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Product Name:	Teicoplanin
Product Number:	T002
CAS Number:	61036-62-2
Molecular Formula:	A_2-1 (CAS 91032-34-7) $C_{88}H_{95}Cl_2N_9O_{33}$|1877.64| A_2-2 (CAS 91032-26-7) $C_{88}H_{97}Cl_2N_9O_{33}$|1879.65| A_2-3 (CAS 91032-36-9) $C_{88}H_{97}Cl_2N_9O_{33}$|1879.65| A_2-4 (CAS 91032-37-0) $C_{89}H_{99}Cl_2N_9O_{33}$|1893.68| A_2-5 (CAS 91032-38-1) $C_{89}H_{99}Cl_2N_9O_{33}$|1893.68| A_3-1 (CAS 93616-27-4) $C_{72}H_{68}Cl_2N_8O_{28}$|1564.25| A_3-2 (CAS 91032-39-2) $C_{66}H_{58}Cl_2N_8O_{23}$|1402.11|
Molecular Weight:	Varies
Form:	Powder
Appearance:	White to light yellowish powder
Solubility:	Water: Sparingly
Elemental Analysis:	Composition: Teicoplanins A_2: ≥80.0% Teicoplanins A_3: ≤15.0% Other Impurities: ≤5.0%
pH:	6.3 - 7.7
Storage Conditions:	2-8°C

Description:

Teicoplanin is a lipoglycopeptide complex first reported from *Actinoplanes teichomyceticus* in 1978. Teicoplanin is a mixture of several compounds; 5 major compounds, Teicoplanin A2-1 thru A2-5, and 4 minor compounds, referred to as related substances 1 to 4 or teicoplanin RS1-4. All teicoplanin compounds share the same glycopeptide core, termed teicoplanin A3-1, a fused ring structure to which two carbohydrates (mannose and N-acetylglucosamine) are attached. To view related teicoplanin compounds click here.

Teicoplanin has a similar spectrum of activity as vancomycin and is effective against gram-positive bacteria, including methicillin-resistant *Staphylococcus aureus* (MRSA) and *Enterococcus faecalis.*

Teicoplanin is a cell wall synthesis inhibitor that works by inhibiting peptidoglycan synthesis and polymerization in two ways. One mechanism inhibits N-acetylmuramic acid (NAM) and N-acetylglucosamine (NAG) from coming together to form the peptidoglycan backbone. Another mechanism prevents cross-linking between amino acid residues in the peptidoglycan chain.

Teicoplanin is sparingly soluble in water.

Synonyms:Targocid, Teichomycin

Mechanism of Action:

Teicoplanin prevents peptidoglycan synthesis and polymerization by two separate mechanisms. One mechanism prevents N-acetylmuramic acid (NAM) and N-acetylglucosamine (NAG) from linking together forming the peptidoglycan backbone. The second mechanism prevents cross-linking between amino acid residues in the peptidoglycan chain. This mechanism is nearly identical to vancomycin; however, teicoplanin is considered a safer drug due to its lower nephrotoxicity and ototoxicity.

Spectrum:

Teicoplanin targets primarily gram-positive bacteria especially those resistant to methicillin. These include the drug resistant superbug, MRSA (Methicillin resistant *Staphylococcus aureus*) and *Enterococcus faecalis*. Teicoplanin is effective for treating MRSA infections because it inhibits cell wall synthesis through a different mechanism than β-lactam antibiotics.

Teicoplanin is similar but not identical to vancomycin in its spectrum of activity. The MICs for most gram-positive bacteria and anaerobes are comparable, but teicoplanin is less active against some strains of *Staph. haemolyticus* (MIC 16–64 mg/L compared to ≤4 mg/L for vancomycin). Both VanA-type VRE and VISA isolates are also resistant to teicoplanin.

Microbiology Applications

Antimicrobial Susceptibility Testing (AST & MIC) teicoplanin is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against Gram positive microbial isolates. Medical microbiologists use AST results to recommend antibiotic treatment options for infected patients. Representative MIC values include:

- *Enterococcus faecalis* 0.06 µg/mL - 0.25 µg/mL
- Methicillin-resistant *Staphylococcus aureus* 0.125 µg/mL - >64 µg/mL

For a complete list of teicoplanin MIC values, click here.

References:

Murphy, S., and R. J. Pinney. "Teicoplanin or Vancomycin in the Treatment of Gram–positive Infections?" Journal of Clinical Pharmacy and Therapeutics 20.1 (2008): 5-11. Web. 15 Nov. 2012.

Joshi, S., Ray, P., Manchanda, V., Bajaj, J., Chitnis, D. S., Gautam, V., &...Balaji, V. (2013). Methicillin resistant *Staphylococcus aureus* (MRSA) in India: Prevalence & susceptibility pattern. *Indian Journal Of Medical Research*, 137(2), 363-369