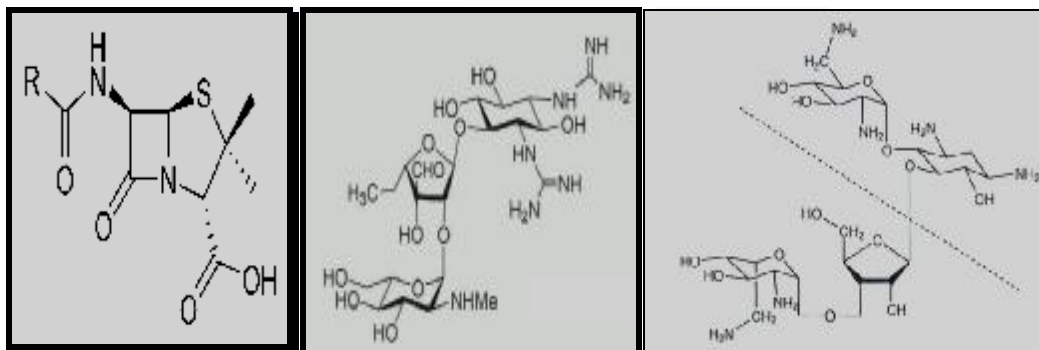


Product Profile



| | |
|--|---|
| Product Name: | <i>Penicillin-Streptomycin-Neomycin Solution, 10,000 units/ml Penicillin G Sodium Salt, 10 mg/ml Streptomycin Sulfate, 25mg/ml Neomycin</i> |
| Product Catalog Number | 03-034-1 |
| Concentration: <i>Penicillin G(Sodium Salt) Streptomycin Sulfate Neomycin NaCl</i> | 10,000 units/ml 10mg/ml(10,000µg/ml) 25 mg/ml 0.85% Saline |
| Unit Size Availability: | (B)100ml:(C)20ml |
| Formulation: | Frozen Solution |
| Defined Storage Conditions: | -20°C |
| Stability: (Under Ideal Handling & Storage) | <i>Please Refer To Product Label</i> |

Important Note! Please read the MSDS and Product Profile carefully in their entirety before using this material for possible safety precautions and potential hazards.

Product Description

Penicillin-Streptomycin-Neomycin is an antibiotic combination solution composed of Aminoglycoside-β Lactam moieties and Neomycin. The Aminoglycoside-β Lactam combination accords broad-spectrum bacteriocidal activity against both gram-positive and gram-negative bacteria. The Mode of Action (MOA) of Penicillin G interferes with the final stage of synthesis of the bacterial cell wall causing disruption of the osmotic pressure gradient with ensuing lysis and cell death, whereas the MOA of Streptomycin Sulfate modifies the permeability of the cell wall, interferes with prokaryote protein synthesis and cellular respiration by irreversibly binding to the 30S ribosome subunit to cause a misreading/miscoding of the mRNA.

In essence, this activity freezes the 30S initiation complex (i.e.30S-mRNA-tRNA) and interrupts any further progress in the initiation phase to chain-elongating ribosome. Both antibiotics, Penicillin, a β-Lactam moiety when combined with Streptomycin, an Aminoglycoside moiety, synergistically enhance their range of activities and increase their effectiveness as opposed to when utilized on an individual basis.

Neomycin Sulfate is an anti-microbial aminoglycoside (aminocyclitol) complex of Neomycins isolated from *Streptomyces fradiae* and represents products of secondary carbohydrate metabolism. They are a closely related group of bactericidal antibiotics and have broadly similar toxicological features.¹ Neomycin Sulfate is an antimicrobial agent with bactericidal properties against Gram-positive and especially against Gram-negative bacteria. It is a polybasic compound, positively charged causing precipitation of micellar lipids by interaction with negatively-charged fatty acids and dihydroxy bile acids. As a result, cholesterol is co-precipitated and its absorption impaired. Its Mode of Action (MOA) also includes binding to the L-6 protein of the 50S ribosomal subunit, inhibits translocation and elicits miscoding and thereby inhibits protein synthesis and compromising the bacterial cell-wall/membrane structure causing bacterial cell death. The 2-deoxystreptamine-containing antibiotics include the structurally related Gentamicins, Kanamycins and Streptomycins².

Cross-resistance occurs between Kanamycin, Neomycin, Paromomycin and Framycetin and partial cross-resistance has been reported between Kanamycin and Streptomycin. The Aminoglycosides are excellent at synergizing with the β-Lactams and glycopeptides to improve the efficiency of their bactericidal activity³. It is incompatible with Amphotericin, Sodium Bicarbonate and other pharmacological preparations.

Important Note: Please consult other comprehensive pharmacology references regarding other antibiotic properties, characteristics, interactions and possible incompatibilities.

On the one hand, the efficacy of a *Penicillin-Streptomycin-Neomycin Solution* synergistic combination is accomplished when two individual bactericidal drugs interfere with different constituents in the bacterial cellular or metabolic pathways. The result is an effect greater than could be attributed to additive action. In theory, a drug affecting the permeability of the cell membrane (i.e. streptomycin), plus a drug affecting the cell wall (i.e. penicillin), when used in combination, may be more effective than either drug used alone. In this case, there is even evidence of synergism between these two drugs. On the other, Neomycin Sulfate also has antibacterial activity especially against gram-negative bacteria and contributes its part by enhancing the combination. In sum, *Biological Industries' Penicillin-Streptomycin-Neomycin Solution* is an effective antimicrobial combination offering a wide spectrum of activity by serving as a drug of choice that is most active against potential pathogenic microorganisms or one of the least toxic alternatives available for cell culture.

Important Note: In some cases, some antibiotics when used in combination often exert atypical cytotoxic effects at lower concentrations than when utilized on an individual basis. Please consult other comprehensive pharmacology references regarding antibiotic properties, characteristics, interactions and possible incompatibilities.

Some of the Predominant Characteristics of Penicillin-Streptomycin-Neomycin Solution include:

- Easy-To-Use
- Synergistic Anti-Bactericidal Broad-Spectrum Combination Antibiotic
- Frozen Solution
- Sterility-Tested

Instructions/Procedure

The product should be stored at -20°C and allowed to thaw to room temperature prior to use. The contents should not be left in the light for prolonged periods as it is light-sensitive. When stored in the dark under ideal conditions, the product is stable until the expiry date.

- 1) Take a bottle out from proper storage conditions at -20°C and read the label.
- 2) Thaw to room temperature.
- 3) Ensure that the cap of the bottle is tight.
- 4) Gently swirl the solution in the bottle to ensure homogeneity.
- 5) Wipe the outside of the bottle with a disinfectant solution such as 70% ethanol.
- 6) Using aseptic/sterile technique under a laminar-flow culture hood, work according to established protocols.

Quality Control

| Test | Specification |
|---------------|---------------|
| Cell Culture: | Test & Record |
| pH: | 4.5-6.5 |
| Sterility: | Sterile |

Auxiliary Products

| Product Name | Catalog Number | Storage Temperature |
|---|----------------|---|
| Dulbecco's Phosphate Buffered Saline(DPBS) without Calcium and Magnesium | 02-023-1 | Room Temperature (15-30 $^{\circ}$) |
| Amphotericin B 250 micrograms/ml | 03-028-1 | -20°C |
| Amphotericin B 2500 micrograms/ml | 03-029-1 | -20°C |
| Penicillin-Streptomycin 10X Solution | 03-031-5 | -20°C |
| Penicillin-Streptomycin Nystatin Solution | 03-032-1 | -20°C |
| Nystatin Cell Culture-Tested Biochemicals (γ -Irradiated) | 41-506-1/5 | -20°C |
| Note: For a list of Serum, other antibiotics, or Biological Industries' Products, please refer to our Product Catalog/Product Profiles/Guides and Internet Site. | | |

References:

- 1) Amphotericin B is the generic name for FUNGIZONE®, a registered trade name of E. R. Squibb & Sons
- 2) 14th Edition Of Merck Index, p.1165.
- 3) Current Editions USP/E Ph
- 4) Biological Industries(BI) Specifications
- 5) Martindale, *The Extra Pharmacopeia*, 28th Edition, Royal Pharmaceutical Society: London, England pps.729-730,1076-1086.
- 6) Walsh, Christopher. *Antibiotics: Actions, Origins and Resistance*, ASM Press: Washington, D.C., 2003, pps.107-120;222-226)
- 7) Gallagher, Jason C. and MacDougall, Conan. *Antibiotics Simplified*, Jones & Bartlett Press: Boston, Massachusetts, 2007, pps.37-48;73-76)
- 8) Barile, Frank A. *Clinical Toxicology: Principles and Mechanisms*, CRC Press: Boca Raton, Florida, 2004.
- 9) Homburger, Freddy, Hayes, John A. and Pelikan, Edward W. *A Guide To General Toxicology*, Karger Press: Basel, Switzerland, 1984, pps.101-102
- 10) Hansel, Donna E. and Dintzis. *Pathology*, Lipponcott Williams & Wilkins Press: Baltimore, Maryland, 2006