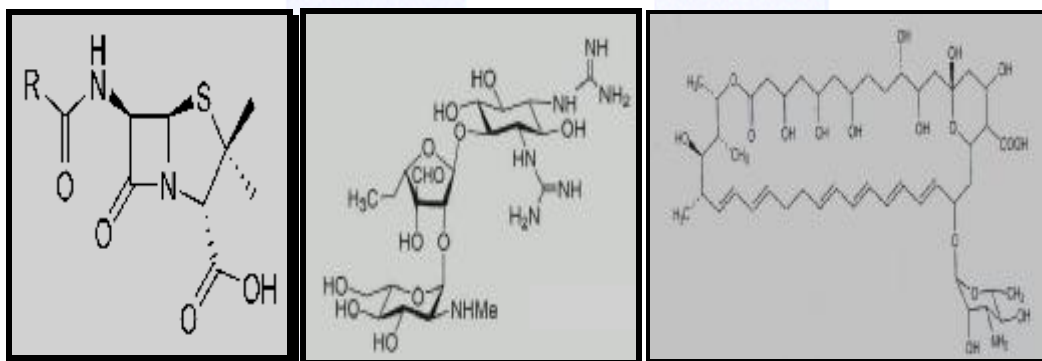


Product Profile



Product Name:	Penicillin-Streptomycin-Nystatin Solution, 10,000 units/ml Penicillin G Sodium Salt, 10 mg/ml Streptomycin Sulfate, Nystatin 1250 units/ml
Product Catalog Number	03-032-1
Concentration: Penicillin G (Sodium Salt) Streptomycin Sulfate Nystatin NaCl	10,000 units/ml 10mg/ml (10,000 µg/ml) 1,250 units/ml 0.85% Saline
Unit Size Availability:	(B) 100ml; (C) 20ml
Formulation:	Frozen Solution
Defined Storage Conditions:	-20°C
Stability: (Under Ideal Handling & Storage)	Please Refer To Product Label

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-Nystatin is an antibiotic combination solution composed of Aminoglycoside-β Lactam moieties and Nystatin¹. 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.

Nystatin is a mixture of anti-mycotic polyenes, like Amphotericin B, and is used in cell culture for the control of fungi, yeasts and molds. This polyene macrolide antimycotic, generally termed Nystatins, like many other antifungals and antibiotics are of bacterial origin. Nystatin has been isolated from the soil actinomycete, *Streptomyces noursei*. The Mode of Action (MOA) of this family is exhibited by its ability to bind to steroidal alcohols (e.g. cholesterol, cholestanol), specifically ergosterol, in the cell membrane of susceptible fungi by creating transmembrane channels in the cell membrane *per se* thereby increasing membrane permeability.

The resultant loss of cations (e.g. K⁺, Na⁺, H⁺), and/or other low molecular-weight substances including sugars, amino acids or nucleotides, the increase or amplification of Na⁺/K⁺ pump activity in addition to the inhibitory effect through these channels in the extracellular space of several membrane-bound enzymes, collectively and in concert, all contribute to the demise of these types of organisms. Nystatin is primarily fungistatic at low concentrations against biphasic fungi, Dermatophyta and molds. It is also effective against yeasts.

These intermolecular hydrogen bonding interactions among the carboxyl, hydroxyl and amino groups stabilize the channel pore causing the cytoplasmic contents to escape. It may be toxic to some insect cell types.

The current role of this anti-mycotic selective ionophore in cell culture is multi-faceted and may be divided into several principal functions.

- Anti-Mycotic Spectrum only, it is not bactericidal or virucidal
- Interacts with the fungal cell membranes by increasing cell-membrane permeability by providing a pathway for H⁺ flow
- One hundred percent(100%) pharmacokinetic activity

On the one hand, the efficacy of a *Penicillin-Streptomycin-Nystatin 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, Nystatin has no antibacterial activity but may be fungistatic or fungicidal based on dose concentration. In sum, Biological Industries' *Penicillin-Streptomycin-Nystatin 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-Nystatin Solution include:

- Easy-To-Use
- Synergistic Anti-Bactericidal Broad-Spectrum Combination Antibiotic
- A Cationic- Selective Anti-Mycotic Ionophore with Fungistatic-Fungicidal Activity
- 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:	4.4-4.6
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°)
Amphotericin B 250 micrograms/ml	03-028-1	-20°C
Amphotericin B 2500 micrograms/ml	03-029-1	-20°C
Penicillin-Streptomycin Nystatin Solution	03-032-1	-20°C
Penicillin-Streptomycin Amphotericin B Solution	03-033-1	-20°C
Nystatin Cell Culture-Tested Biochemicals (γ-Irradiated)	41-506-1/5	-20°C
Note: For a list of Serum, other antibiotics, please refer to our Product Catalog/Product Profiles/Guides and Internet Site.		

References:

- 1) Nystatin is the generic name for MYCOSTATIN® which is 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