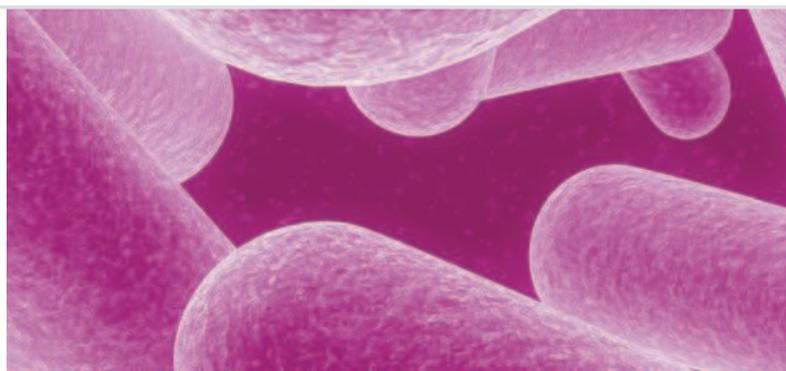


# ANTIBIOTICS

# 09

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## Antibiotic / Antimycotic Solutions

Antibiotics are natural substances of bacterial origin derived entirely or partially from certain microorganisms that are used to treat bacterial or fungal infections by selective inhibition. Chemotherapeutic agents refer to any synthetic or man-made substance that actually characterizes the so-called newer antibiotics today that are essentially chemically-modified or chemically synthesized biological products. Today, the term 'antibiotic' is used to refer to all types of antimicrobial agents. The distinctions between both natural and man-made synthetic substances are designed, in one way or another, to block one or several crucial metabolic pathways without untoward manifestations to the host, or in this case, the cell culture. Preventing cell culture contamination is an essential part of all animal cell culture. The risk of contamination may be eliminated by effective aseptic/sterile techniques and the judicious use of antibiotics.

Antibiotics may be classified into several key groups by virtue of their mechanism of action which include:

- Inhibition of Cell-Wall Synthesis
- Inhibition of Nucleic Acid Synthesis (i.e. RNA/DNA)
- Inhibition of Protein Synthesis
- Inhibition or Interference of Microtubule Function

The major advantage of some antibiotics is their ability to selectively target crucial and specific cell processes which either kill the microorganism in question or prevent them from reproducing unabated. Antibiotics are often also categorized by:

- Their Spectrum of Activity
- Their Bacteriostatic/Bactericidal Properties
- Their Gram-Negative or Gram-Positive Characteristics

Antibiotics are ineffective against viruses.

Although many laboratories use antibiotics on a regular basis, the decision to use them to prevent cell culture contamination must be based on the individual researcher's requirements and experience.

The appropriate antibiotics may be added to culture media to eliminate microbial contaminants. The most commonly encountered microorganisms are bacteria, yeast, other fungi and mycoplasma while the most common routes of contamination are poor aseptic technique and use of non-sterile medium components.

Biological Industries offers a wide range of effective antibiotics that include solutions, mixtures, and powdered chemical formulations. The following table is presented as a general guide for use in cell culture.

Product Name	Catalogue No.	Unit Size	Storage Temp.	Formulation Page
<b>Amphotericin B<sup>(2)</sup> Solution</b> 250 microgram/ml	03-028-1B	100ml	-20°C	+
	03-028-1C	20ml	-20°C	+
<b>Amphotericin B<sup>(2)</sup> Solution</b> 2500 microgram/ml	03-029-1B	100ml	-20°C	+
	03-029-1C	20ml	-20°C	+
<b>Nystatin<sup>(1)</sup> Suspension</b> 10,000 units/ml	03-030-1C	20ml	-20°C	+
<b>Penicillin-Streptomycin Solution</b> Penicillin G Sodium Salt, 10,000 units/ml Streptomycin Sulfate, 10mg/ml	03-031-1B	100ml	-20°C	+
	03-031-1C	20ml	-20°C	+
<b>Penicillin-Streptomycin Solution, 10X Conc.</b> Penicillin G Sodium Salt, 100,000 units/ml Streptomycin Sulfate, 100mg/ml	03-031-5B	100ml	-20°C	+
	03-031-5C	20ml	-20°C	+
<b>Penicillin-Streptomycin Nystatin<sup>(1)</sup> Solution</b> Penicillin G Sodium Salt, 10,000 units/ml Streptomycin Sulfate, 10mg/ml Nystatin <sup>(1)</sup> , 1,250 units/ml	03-032-1B	100ml	-20°C	+
	03-032-1C	20ml	-20°C	+
<b>Penicillin-Streptomycin Amphotericin B<sup>(2)</sup> Solution</b> Penicillin G Sodium Salt, 10,000 units/ml Streptomycin Sulfate, 10mg/ml Amphotericin B <sup>(2)</sup> , 25 microgram/ml	03-033-1B	100ml	-20°C	+
	03-033-1C	20ml	-20°C	+
<b>Penicillin-Streptomycin Neomycin Solution</b> Penicillin G Sodium Salt, 10,000 units/ml Streptomycin Sulfate, 10mg/ml Neomycin Sulfate, 10mg/ml	03-034-1B	100ml	-20°C	+
	03-034-1C	20ml	-20°C	+

Product Name	Catalogue No.	Unit Size	Storage Temp.	Formulation Page
<b>Gentamicin Sulfate Solution</b> 50 mg/ml	03-035-1B	100ml	AMB	+
	03-035-1C	20ml	AMB	+
<b>Kanamycin Sulphate Solution</b> 10mg/ml	03-049-1B	100ml	-20°C	+
	03-049-1C	20ml	-20°C	+

- (1) **Nystatin** is the generic name for **Mycostatin**® which is the registered trade mark of E.R. Squibb & Sons.
- (2) **Amphotericin B** is the generic name for **Fungizone**® which is the registered trade mark of E.R. Squibb & Sons.

### Use of Antibiotics in Mammalian Cell Culture

Antibiotics are secondary metabolites which are produced by certain strains of bacteria and fungi. In cell culture, antibiotics have long been used to prevent the growth of contaminating bacteria and fungi.

The following table is provided as a guide for antibiotics selection and appropriate concentrations. Refer to pharmacology guides for antibiotic incompatibilities and other properties not included in the table.

Product Name	Catalogue No.	Concentration	Storage Temp.	Mode of Action	Suggested Working Conc.
<b>Amphotericin B</b>	03-028-1	250µg/ml	-20°C	Inhibition of cell membrane permeability (fungi and yeasts)	1-10ml/lit
<b>Amphotericin B</b>	03-029-1	2,500µg/ml	-20°C	Inhibition of cell membrane permeability (fungi and yeasts)	0.1-1ml/lit
<b>Nystatin*</b>	03-030-1	10,000un/ml	-20°C	Inhibition of cell membrane permeability (fungi and yeasts)	1-10ml/lit
<b>Penicillin-Streptomycin</b>	03-031-1	Penicillin: 10,000un/ml Streptomycin: 10mg/ml	-20°C	Penicillin: Inhibition of cell wall synthesis Streptomycin: Inhibition of protein synthesis by binding to 30S subunit of the bacterial ribosome	10ml/lit
<b>Penicillin-Streptomycin 10x</b>	03-031-5	Penicillin: 100,000un/ml Streptomycin: 100mg/ml	-20°C	See: Penicillin-Streptomycin	1ml/lit
<b>Penicillin-Streptomycin-Nystatin</b>	03-032-1	Penicillin: 10,000un/ml Streptomycin: 10mg/ml Nystatin: 1,250un/ml	-20°C	See: Penicillin, Streptomycin and Nystatin	10ml/lit
<b>Penicillin-Streptomycin-Amphotericin B</b>	03-033-1	Penicillin: 10,000un/ml Streptomycin: 10mg/ml Ampho. B: 25µg/ml	-20°C	See: Penicillin, Streptomycin and Amphotericin B	10ml/lit
<b>Penicillin-Streptomycin-Neomycin</b>	03-034-1	Penicillin: 10,000un/ml Streptomycin: 10mg/ml Neomycin: 10mg/ml	-20°C	See: Penicillin and Streptomycin Neomycin: Inhibition of protein synthesis by binding to 30S subunit of the bacterial ribosome	10ml/lit
<b>Gentamicin sulfate</b>	03-035-1	50mg/ml	15-30°C	Inhibition of protein synthesis by binding to 30S subunit of the bacterial ribosome	1ml/lit
<b>Kanamycin sulfate</b>	03-049-1	10mg/ml	-20°C	Inhibition of protein synthesis by binding to 30S subunit of the bacterial ribosome	10ml/lit

\* Suspension in water