



Antibiotics

Cell culture media are very nutritious and if proper aseptic techniques are not maintained are prone to unwanted contamination. Antibiotics help to prevent microbial contamination. The key advantage of antibiotics is their ability to selectively target a microorganism's metabolic pathway without seriously affecting the eukaryotic host. Antibiotic resistance has proven to be a useful tool to select and maintain stable eukaryotic cell lines that have been transfected with vectors containing the gene for bacterial resistance.

HiMedia offers a selection of antibiotics to counter bacterial, fungal as well as mycoplasma contaminations. We also supply a good range of high quality selection antibiotics. Each antibiotic is tested for toxicity in a cell culture application at a recommended concentration.

Antibiotics should not be used as an alternative to proper aseptic techniques. Antibiotics usage leads to development of antibiotic resistant organisms. It can mask cryptic contaminants that may flourish after removal of antibiotics or if the culture conditions are changed.

We recommend avoiding incorporation of antibiotics for long term maintenance of cell lines. When antibiotics are used for long periods of time, it is advisable to maintain parallel cultures without antibiotics. Care should be taken when two or more antibiotics are used in the same culture system. Combination of antibiotics might exert toxic effects on cells at lower concentrations than those indicated for single use.

Product name	Code	Working concentration	Storage	Activity against	Mode of action	Stability at 37°C
Amphotericin B solution (250µg/ml)	A011	10ml/L	-20°C	Yeasts and molds	Binds with ergosterol of fungal cell membrane and increases the membrane permeability	3days
Amphotericin B	TC019	2.5mg/L	2-8°C			
Ampicillin sodium salt	TC021	100mg/L	2-8°C			
Ampicillin solution (10mg/ml)	A022	10ml/L	-20°C	Gram positive & Gram negative bacteria	Interferes with the final stage of bacterial cell wall synthesis	3days
Ampicillin solution (100mg/ml)	A023	1ml/L	-20°C			
Antibiotic – Antimycotic solution (100X) (w/ Penicillin 10000U and Streptomycin 10mg and Amphotericin 25µg per ml in normal saline)	A002 A002A	10ml/L	-20°C	Gram positive & Gram negative bacteria, Yeasts and Molds	Interferes with the final stage of bacterial cell wall synthesis Inhibits protein synthesis by binding to 30S units of ribosome and causing misreading of the genetic code	3days



Product name	Code	Working concentration	Storage	Activity against	Mode of action	Stability at 37°C
Antibiotic solution (100X) (w/ Penicillin 10000U and Streptomycin 10mg per ml in 0.9% normal saline)	A001 A001A	10ml/L	-20°C			3days
Antibiotic solution (50X) (w/ Penicillin 5000U and Streptomycin in 5mg per ml in 0.9% normal saline)	A003	20ml/L	-20°C			3days
Antibiotic solution (50X) (w/ Penicillin 5000U and Streptomycin 5mg per ml in powder form)	A004	20ml/L	2-8°C	Gram positive & Gram negative bacteria	Interferes with the final stage of bacterial cell wall synthesis. Inhibits protein synthesis by binding to 30S units of ribosome and causing misreading of the genetic code	3days
Antibiotic solution (100X) (w/ Penicillin 10000U and Streptomycin 10mg per ml in citrate buffer)	A014	10ml/L	-20°C			3days
Antibiotic solution (100X) (w/ 10,000 U Penicillin, 5 mg Streptomycin per ml in 0.9% normal saline)	A018	10ml/L	-20°C			3days
Penicillin-Streptomycin-L-Glutamine solution (10000U Penicillin 10mg Streptomycin and 200mM L-Glutamine per ml)	A007	10ml/L	-20°C			3days
Carbenicillin disodium salt	TC199	10µg/ml	2-8°C	Gram positive & Gram negative	Inhibits enzymes involved in bacterial cell wall synthesis	3days
Carbenicillin solution 100 mg/ml	A019	1ml/L	-20°C			
Chloramphenicol	TC204	5µg/ml	RT	Gram positive, Gram negative bacteria & mycobacteria	Inhibits protein synthesis by binding to 50S subunit of ribosome.	5days
Cephalothin sodium salt	TC022	100mg/L	2-8°C	Gram positive bacteria	Inhibits synthesis of cell wall	3days
Cephataxime solution 100 mg/ml	A020	5ml/L	-20°C	Gram positive & Gram negative	Inhibits the bacterial cell wall synthesis	3days
Cephataxime solution 250 mg/ml	A025	2ml/L	-20°C			
Erythromycin	TC024	100mg/L	RT	Gram negative & positive bacteria	Inhibits elongation during transpeptidation	3days
Gentamicin sulfate	TC026	50mg/L	2-8°C	Gram negative & positive bacteria and mycoplasma	Inhibits protein synthesis by binding to 50S subunit of ribosome	5days
Gentamicin solution 50mg/ml	A005	1ml/L	2-8°C			
Gentamicin Glutamine solution (w/ 200mM L-Glutamine and 5mg/ml Gentamicin in 0.9% normal saline)	A006	10ml/L	-20°C			
Gentamicin solution 10mg/ml	A010	5ml/L	2-8°C			
Kanamycin sulphate	TC136	100mg/L	2-8°C	Gram negative & positive bacteria and mycoplasma	Inhibits protein synthesis by binding to 70S subunit of ribosome, Inhibits translocation and elicits miscoding	5days
Kanamycin solution 10mg/ml	A008	10ml/L	2-8°C			
Kanamycin solution 50mg/ml	A009	2ml/L	2-8°C			
Lincomycin hydrochloride	TC203	100mg/L	2-8°C	Gram positive bacteria	Interfere with bacterial protein synthesis	4days

Note: TC : Antibiotic Powders

A : Antibiotic Solutions

Product name	Code	Working concentration	Storage	Activity against	Mode of action	Stability at 37°C
Neomycin sulfate salt	TC031	50mg/L	RT	Gram negative & Gram positive bacteria	Inhibit protein synthesis	5days
Neomycin Sulfate solution 10mg/ml	A024	5ml/L	2-8°C			
Nystatin	TC032	50mg/L	2-8°C	Yeasts and molds	Binds with ergosterol of fungal cell membrane and increases the membrane permeability	3days
Nystatin Solution 10,000U/ml	A012	24ml/L	-20°C			
Oxytetracycline	TC200	30 µg/ml	RT	Gram negative & positive bacteria	Inhibits protein synthesis by binding to 30S ribosome unit	
Penicillin G Sodium salt	TC020	100,000U/L	RT	Gram positive bacteria	Interferes with the final stage of bacterial cell wall synthesis	3days
Penicillin G Potassium salt	TC187	100,000U/L	RT	Gram positive bacteria	Interferes with the final stage of bacterial cell wall synthesis	3days
Polymyxin B sulfate	TC033	50mg/L	2-8°C	Gram negative bacteria	Interferes with the permeability of bacterial cell	5days
Polymyxin B solution 50mg/ml	A013	1ml/L				
Spectinomycin dihydrochloride	TC034	7.5-20mg/L	2-8°C	Gram negative & positive bacteria	Inhibits elongation at membrane transpeptidation step	3days
Streptomycin sulphate	TC035	100mg/L	2-8°C	Gram negative & positive bacteria	Inhibits protein synthesis by binding to 30S units of ribosome and causing misreading of the genetic code	3days
Tetracycline hydrochloride	TC036	10mg/L	2-8°C	Gram negative & positive bacteria	Blocks aminoacyl-tRNA by binding to the 16S rRNA thereby inhibiting action of the prokaryotic 30S ribosome	4days
Tylosin tartarate	TC205	8mg/L	2-8°C	Gram positive bacteria & Mycoplasma	Inhibits protein synthesis by binding to the 50S subunit of the bacterial ribosome	3days

Antibiotic Selection agents

HiMedia offers a variety of antibiotics for use in cell culture and bacterial selection. These selective agents help researchers to fulfill their needs of dual selection and to establish stable cell lines. Some commonly used eukaryotic selective agents are listed below.

Hygromycin B

CAS No : 31282-04-9
Formula : $C_{20}H_{37}N_5O_{13} \cdot HCl$
Molecular weight : 563.5

Hygromycin B, is an aminoglycosidic antibiotic produced by *Streptomyces hygroscopicus*. It is used for the selection and maintenance of prokaryotic and eukaryotic cells transfected with the hygromycin resistance gene, hph. Hygromycin B kills bacteria, fungi and higher eukaryotic cells by inhibiting protein synthesis. The resistance gene codes for a kinase (Hygromycin phosphotransferase, HPT)

that inactivates Hygromycin B through phosphorylation. Cloning of the resistance gene and fusion with eukaryotic promoters has resulted in the development of vectors that permit selection for resistance to Hygromycin B in both prokaryotic and eukaryotic cells.

Geneticin disulphate (G418 sulphate)

CAS No : 108321-42-2
Formula : $C_{20}H_{40}N_4O_{10} \cdot 2H_2SO_4$
Molecular weight : 692.7

G418 sulphate is an aminoglycoside antibiotic similar in structure to gentamicin B1 produced by *Micromonospora rhodorangea*. G418 blocks polypeptide synthesis by inhibiting the elongation step in both prokaryotic and eukaryotic cells. Resistance to G418 is conferred by the neomycin resistance genes from transposons Tn5 and Tn601 encoding an aminoglycoside 3'phosphotransferase, APH 3' II and aminoglycoside 3'-phosphotransferase, APH 3' I respectively.



Puromycin hydrochloride

CAS No: 58-58-2

Formula: $C_{22}H_{29}N_7O_5 \cdot 2HCl$

Molecular weight: 471.51

Puromycin is an aminonucleoside antibiotic produced by *Streptomyces alboniger*. It specifically inhibits peptidyl transfer on both prokaryotic and eukaryotic ribosomes. This antibiotic inhibits the growth of Gram positive bacteria and various animal and insect cells. Resistance to puromycin is conferred by the *pac* gene encoding puromycin N-acetyl-transferase (PAC) that was found in a *Streptomyces* producer strain. In some particular conditions puromycin could also be used for selection of *E. coli* strains transformed with plasmids carrying the *pac* gene.

Mycophenolic acid

CAS No: 24280-93-1

Formula: $C_{17}H_{20}O_6$

Molecular weight: 320.34

Mycophenolic acid is an immunosuppressant produced by *Penicillium brevi-compactum*. It inhibits DNA synthesis in T and B lymphocytes. It is used to select transfected animal cells expressing the *Escherichia coli* gene for xanthine guanine phosphoribosyl transferase.

Product name	Code	Working concentration	Storage	Activity against	Mode of action	Stability at 37°C
Actinomycin D	TC018	1µg/ml	2-8°C	Gram positive	Complexes with DNA and interferes with RNA synthesis	3days
Bacitracin	TC201	5 - 10µg/ml	2-8°C	Gram positive bacteria	Inhibits bacterial cell wall synthesis	
Carbenicillin disodium salt	TC199	100µg/ml	2-8°C	Gram negative bacteria	Blocks bacterial cell wall formation	
Cycloheximide	TC196	10µg/ml	2-8°C	Eukaryotes	Interferes with protein synthesis	3days
G418 disulfate salt G418 Solution 50mg/ml	TC025 A016	100-800µg/ml 2ml-16ml/L	2-8°C -20°C	Normal prokaryotic and eukaryotic cells	Blocks polypeptide synthesis in eukaryotic cells by binding irreversibly to 80S ribosomes and therefore disrupting their proofreading capability.	8days
Hygromycin B Hygromycin B Solution 50mg/ml	TC027 A015	100-200 µg/ml 2-4 ml/L	2-8°C	Bacteria, Fungi and Eukaryotes	Blocks polypeptide synthesis and inhibits chain elongation	30days
Mycophenolic Acid	TC197	25µg/ml	2-8°C	Yeast	Inhibits purine nucleotide synthesis	
Puromycin dihydrochloride	TC198	1-10µg/ml	2-8°C	Gram positive bacteria and Eukaryotes	Inhibits protein synthesis	
Vancomycin dihydrochloride	TC202	30µg/ml	2-8°C	Gram positive bacteria	Inhibits bacterial cell wall synthesis	