

Formulated conventional media

Interchim provides Growth Media made of high quality materials, and its uniform mixing and grinding procedure ensures that the powders are homogenous. It also saves time because individual components do not need to be weighed out and added to the mixture, and the flexibility of the powder form allows the researcher to make just the desired quantity of the media.

2xYT Medium Broth is a nutritionally rich medium for the growth of recombinant strains of *Escherichia coli* and can be used in the propagation of M13 bacteriophage in research applications. *Escherichia coli* will thrive in this medium because of the additional amino acids, nucleotide precursors, vitamins, and other essential metabolites that the cells need during growth and development. Sodium chloride helps provide a suitable osmotic environment for the bacteria.

A **Medium Broth** is a minimal media used for cultivation and propagation of *Escherichia coli*. The addition of glycerol after autoclaving provides the bacteria with a carbon and energy source upon which the bacteria can grow. Salts supply nitrogen, phosphorus, and trace metals the bacteria would need during its growth cycle. Magnesium sulfate supplies the magnesium ions required for enzymatic replication of DNA.

H Medium Broth and **Lambda Broth** are moderately rich, general-purpose media that are used for growing *Escherichia coli*. Lambda Broth is most useful in the propagation of λ Phage. These broths contain a large quantity of tryptone to supply the growing organisms with the basic nutrients and growth factors needed to support growth. Sodium chloride is added to the mixtures in various concentrations to help maintain the proper isotonic environment for the organisms during their growth phase.

LB-Broth (Miller) is used for the cultivation of *Escherichia coli* cultivation as with all LB Broths and LB Agars. Casein peptone and yeast extract supply essential growth factors, such as nitrogen, carbon, sulfur, minerals and vitamins. LB Broth media formulations (Miller, Lennox, and Luria) have been widely used in molecular microbiology applications for the preparation of plasmid DNA and recombinant proteins. The media are nutrient-rich formulations, which provide peptides and peptones, vitamins, and trace elements. The three formulations differ in the amount of sodium chloride, thus providing selection of the appropriate osmotic conditions for the particular bacterial strain and desired culture conditions. The low salt formulations, Lennox and Luria, are ideal for cultures requiring salt-sensitive antibiotics.

for the *Escherichia coli* cultivation. Bacteria can grow rapidly on this medium when the medium is supplemented with glycerol (which acts as a carbon and energy source). Salts present in this medium supply nitrogen, phosphorus, and metal traces that the bacteria would need for growth, and magnesium sulfate supplies magnesium ions for DNA replication.

M9 Medium Broth and **M9CA Medium Broth** are minimal medias that are each dedicated to *Escherichia coli*. They can also be used to maintain bacteria for use with M13. These broths can be supplemented with specific amino acids or other metabolites the researcher may require, and they are supplemented with ammonium chloride, which provides a source of nitrogen. M9CA Medium Broth will also support the growth of recombinant strains of *Escherichia coli*. M9CA is supplemented with casamino acids, which provide a source of nitrogen used in the production of amino acids. Phosphates are used to buffer the media against changes in pH due to metabolism, and sodium chloride is present to provide a suitable osmotic environment for the growing bacteria.

NZCYM Broth, **NZYM Broth**, and **NZM Broth** are used in the cultivation of recombinant strains of *Escherichia coli* and are useful for the lambda bacteriophage propagation. They contain NZ-Amino Acid, which is a rich source of high quality amino acids and peptides produced by the enzymatic digest of casein. NZCYM and NZYM broths contain yeast extract, and NZCYM Broth contains casamino acids, which provide a rich source of free amino acids required for growth of recombinant strains of *Escherichia coli*. Additional growth components, such as magnesium sulfate and magnesium chloride hexahydrate, are present to provide a source of magnesium ions that are needed in the enzymatic reaction of DNA replication. Sodium chloride provides the growing bacteria a suitable osmotic environment.

Technical tip

Cells are the structural units of all living things. Cells arise in the body from progenitor or stem cells and become specialized for one or more distinct functions such as contraction, nerve conduction, secretion, absorption, or protection. This process of cell specialization is known as cell differentiation. Structural or morphological modifications during differentiation are accompanied by biochemical changes.

Cell culture is a laboratory tool used primarily for the production of cells and cell products. In order to continually divide and function, most cells require medium that provides nutrients and oxygen. Cells are suspended in tissue culture medium for feeding and oxygenation. Cells have a natural tendency to grow in three dimensions and nutrient medium must be frequently replaced in order to properly nourish the cells to propagate continual growth and remove metabolic waste build-up. Cells can be cultivated using a variety of techniques including: two-dimensional cultures; suspension cultures; and artificial capillary cell culture.

Growing bacteria for research purposes is an important area in genetic and molecular biology research. Researchers need a variety of microbiological growth media that will support their organisms in an efficient and productive manner. Selecting the media that will best serve the necessary requirements will allow an increase in both the bacterial yield and DNA expression.

Cell Biology - Culture

Cell Culture reagents

SOB Broth is a nutritionally rich growth medium used in the competent cells preparation and transformation. Placing bacteria in this medium prepares them for the introduction of foreign DNA into the cell and helps the bacteria survive this process because of the medium's rich isotonic environment. This medium contains tryptone and yeast extracts, which provide the nitrogen and growth factors needed for the cells to replicate and recover from the transformation process. Sodium chloride provides a suitable osmotic environment, and magnesium sulfate provides the magnesium ions used in the enzymatic reaction related to DNA.

Superbroth is a rich medium used for obtaining high yields of lambda bacteriophage in liquid lysates. Superbroth contains a large quantity of tryptone and yeast extracts that provide nutrients and growth factors needed to produce the increased yield of lambda phage.

Terrific Broth was developed to increase yields for plasmid purification from *E. coli*. Due to its enriched medium, Terrific Broth enables the recombinant strains to maintain an extended growth phase. The tryptone and yeast extract high concentration provide the additional nutrients and growth factors required for better growth of the recombinant strains of *Escherichia coli*. Glycerol is added to provide an additional carbohydrate source in this medium. Potassium Phosphates are present to prevent a drop in pH within the medium during bacterial growth, thus preventing bacterial death.

Tryptone Broth is a general purpose medium used for growing *Escherichia coli*. It contains tryptone which provides the bacteria with the basic nutrients and growth factors needed to support growth. Sodium chloride is present to help maintain a proper osmotic environment for the growing bacteria.

TYGPN Medium Broth is a rich medium on which *Escherichia coli* will grow rapidly. In this medium, a typical strain will double in number in every 20 to 30 minutes. This medium contains a large quantity of tryptone and yeast extract that will provide the necessary amino acids, nucleotide precursors, vitamins, and other metabolites that the cell would otherwise need to synthesize. Sodium phosphate and potassium nitrate are present to buffer the system against any radical changes in pH due to metabolism.

YM Medium Broth is used for the growth and expression of *Agrobacterium*. Using YM Medium during electroporation of *Agrobacterium* results in an increase in transformation efficiency when compared with LB Broth. Yeast extracts provide a source of vitamins and nutrients, and the Mannitol provides an additional carbon source for the organisms. Magnesium sulfate provides magnesium ions used in the enzymatic replication of DNA, and sodium chloride helps to maintain a suitable osmotic environment for the growth of *Agrobacterium*.

YPD Broth is excellent for the propagation and cultivation of yeast, such as *Saccharomyces cerevisiae* and other yeast organisms. Peptone in the broth provides a rich source of carbon, nitrogen, vitamins and minerals. Yeast extracts and glucose provide nucleotide precursors and energy sources additional vitamins.

Description	Cat.#	Qty
2xYT Medium Broth	N14800	100 g
	N14801	500 g
A Medium Broth	N14840	100 g
	N14841	500 g
H Medium Broth	N14850	100 g
	N14851	500 g
Lambda Broth	N14860	100 g
	N14861	500 g
LB Agar Lennox	T37500	10 packs
LB Broth Lennox	T37520	10 packs
LB Broth (Miller)	N13980	500 g
	N13981	1 kg
	N13982	2 kg
M63 Medium Broth	N14870	100 g
	N14871	500 g
M9 Medium Broth	N14710	100 g
	N14711	500 g
M9C4 Medium Broth	N14720	100 g
	N14721	500 g
NZ-Amine A	N14700	250 g
	N14701	500 g
	N14702	1 kg

Description	Cat.#	Qty
NZCYM Broth	N14730	100 g
	N14731	500 g
NZM Broth	N14750	100 g
	N14751	500 g
NZYM Broth	N14740	100 g
	N14741	500 g
SOB Broth	775801	100 g
	775800	500 g
SOC Medium	UPAN146A	10 x 10 ml
SuperBroth	N14760	100 g
	N14761	500 g
Terrific Broth	821111	500 g
Tryptone Broth	N14770	100 g
	N14771	500 g
TYGPN Medium Broth	N14830	100 g
	N14831	500 g
YM Medium Broth	N14820	100 g
	N14821	500 g
YPD Broth	N14810	100 g
	N14811	500 g

Formulated Special Media

AMCELGROW™ Medium

AMCELGROW™ Medium is specifically optimized for the primary in vitro culture of human amniotic fluid cells and chorionic villi (CV) samples in both open (5% CO₂) and closed systems. These primary cultures can then be used for cytogenetic procedures such as karyotyping and FISH. No addition of serum is required and fetal karyotyping time is greatly reduced, compared with use of the conventional medium. This is a one bottle formulation with contains L-Glutamine and antibiotics lessening the chance of contamination and technical error. Just thaw and use.

As can be viewed with the following comparison, AMCELGROW™ can be substituted for the media your lab is currently using without making any additions.

Description	Cat.#	Qty
AMCELGROW™ Medium	AP1020	100 ml
AMCELGROW™ Medium	AP1021	500 ml

Karyotyping Medium (without Phytohemagglutinin (PHA-M))

Karyotyping Medium is intended for use in short-term cultivation of peripheral blood lymphocytes for chromosome evaluation. This medium is based on RPMI-1640 basal medium supplemented with L-Glutamine, fetal bovine serum, heparin and antibiotics (penicillin and streptomycin). Karyotyping Medium is supplied frozen and requires the addition of phytohemagglutinin supplementation (if necessary) before use.

Description	Cat.#	Qty
Karyotyping Medium	AP0191	500 ml

Cultrex® Basement Membrane Extracts

Cultrex Basement Membrane Extract is a soluble form of basement membrane purified from Engelbreth-Holm-Swarm (EHS) tumor. The extract gels at 37°C to form a reconstituted basement membrane. The major components of the Basement Membrane Extract include laminin I, collagen IV, entactin, and heparin sulfate proteoglycan. It can be used for promotion and maintenance of a differentiated phenotype in a variety of cell cultures including primary epithelial cells, endothelial cells, and smooth muscle cells.

Applications :

Cultrex Basement Membrane Extract has been employed in angiogenesis assays, tumor cell invasion assays, and as a vehicle to augment the tumorigenicity of injected tumor cells in nude mice. The many applications require different thicknesses and concentrations. Examples include use of diluted extract at <5 mg/ml for support of primary cell propagation ; higher concentration >5 mg/ml for cell propagation and differentiation studies. Basement Membrane Extract is ideal for Tube Assay, Ring Assay, cell invasion studies, angiogenesis assays, and 3D Culture Assays.

	Growth Factor			
	Reduced		Normal	
Cultrex BME without Phenol Red	FX7090	5 ml	FX7060	5 ml
	FX7091	10 ml	FX7061	10 ml
	FX7092	50 ml	FX7062	50 ml
Cultrex BME with Phenol Red	FX7030	5 ml	FX7000	5 ml
	FX7031	10 ml	FX7001	10 ml
	FX7032	50 ml	FX7002	50 ml
Cultrex BME in PBS with Phenol Red	FX7130	5 ml	FX7120	5 ml
	FX7131	10 ml	FX7121	10 ml
	FX7132	50 ml	FX7122	50 ml

Technical tip

Comparative results of a leading competitor's medium & AMCELGROW

1- Dynamics of colony numbers: The results show the changes in mean colony number per dish for the two media were not found to be statistically significant 7, 8 or 9 days after plating. And when compared on the same day (7 days after plating) and stained with Giemsa, again the difference in number of colonies was not found to be statistically significant.

2- Dynamics of Harvesting: There was not a statistically significant difference in number of colonies between the Competitor's Medium and AMCELGROW™. AMCELGROW™ cultures were harvested 1 day earlier (on day 9) than the Competitor's Medium (on day 10).

3- Area of Colonies : Mean area per colony for AMCELGROW™ was approximately 2.4 times greater (15 days after plating) and 3 times greater (20 days after plating) than for the Competitor's Medium. The mean area per colony increment over a period of 5 days for AMCELGROW™ was approximately 1.6 times higher than for the Competitor's Medium . Results show that AMCELGROW™ increases the rate of proliferation of amniotic cells in comparison to the Competitor's Medium.

Conclusion : Results show that the plating efficiency for cultures of amniotic fluid cells was approximately equal for both the Competitor's Medium and AMCELGROW™. However, use of AMCELGROW™ resulted in approximately 2-3 times more mean per area colonies than the Competitor's Medium.

Technical tip

Basement membranes are continuous sheets of specialized extracellular matrix that form an interface between endothelial, epithelial, muscle, or neuronal cells and their adjacent stroma. Basement membranes are degraded and regenerated during development and wound repair. They not only support cells and cell layers, but they also play an essential role in tissue organization that affects cell adhesion, migration, proliferation, and differentiation. Basement membranes provide major barriers against metastatic tumor cells invasion.

Cultrex® High Protein Concentration Basement Membrane Extract (HC20+™)

Cultrex® HC20+™ was developed for in vivo applications where higher protein concentrations facilitate faster gelling times, increased gel strength, and elevated levels of tumor augmentation. Cultrex® HC20+™ has the advantage of lot-to-lot consistency and controlled protein concentrations to support in vivo angiogenesis assays and tumorigenicity assays.

Applications :

- ◆ Tumorigenicity Assays
- ◆ In vivo Angiogenesis Assays

Components : Basement Membrane Extract without phenol red.

Description	Cat.#	Qty
Cultrex® High Protein BME (HC20+)	BM6040	5 ml
	BM6041	10 ml
	BM6042	50 ml

Cultrex® DIVAA™ Angiogenesis Assay Kit

The Directed In Vivo Angiogenesis Assay (DIVAA™) is the first in vivo system for the angiogenesis study that provides quantitative and reproducible results. With the onset of angiogenesis, cellular vascularization proceeds to invade the angioreactor, and as early as nine days post-implantation, there are enough cells to determine an effective dose response to angiogenic modulating factors. The sleek design of the patented angioreactor optimizes sensitivity and allows for up to four units per mouse, giving a better controlled experiment and decreasing the number of mice required for a study. DIVAA Kit is provided with FITC-Lectin for fluorescent quantitative analysis.

See also Cancerology assays kits page E215.

Applications :

- ◆ Quantitative in vivo angiogenesis analysis

Description	Cat.#	Qty
DIVAA™ Angioreactors	FX7300	48 units
DIVAA™ Angioreactors with BME	FX7370	48 units
DIVAA™ 10X Wash Buffer	FX7320	25 mL
DIVAA™ FGF-2	FX7330	100 ng/10 µL
DIVAA™ CellSpere	FX7340	15 mL
DIVAA™ 200X FITC-Lectin	FX7350	250 µg/50 µL
Heparin Solution	FX7360	10 µL/2 mg/ml

Cultrex® Laminin I (Mouse)

Laminin is an extracellular matrix protein which contains a number of functional domains that allow it to assemble into sheets. Mouse laminin is purified from EHS sarcoma.

Applications :

- ◆ Cell adhesion
- ◆ Cell outgrowth
- ◆ Cell to cell interaction

Preparation : Mouse laminin is provided sterile in DMEM medium with 50 µg/ml gentamycin sulfate, at a concentration of 1 mg/ml.

Description	Cat.#	Qty
Cultrex® Laminin I (Mouse)	Q67990	1 mg

Cultrex® Mouse Collagen IV

Collagen IV is the primary collagen found in the extracellular basement membranes separating a variety of epithelial and endothelial cells. Mouse collagen IV is purified from EHS sarcoma in lathyrotic mice, where it constitutes up to 10% of the total tumor mass.

Applications :

- ◆ Cell adhesion
- ◆ Cell outgrowth

Source : Purified from murine EHS sarcoma.

Description	Cat.#	Qty
Cultrex® Mouse Collagen IV	O68000	1 mg

Cultrex® Rat Collagen I

Rat Collagen I is the major structural component of extracellular matrices found in connective tissue and internal organs, but is most prevalent in the dermis, tendons, and bone. It is a 300 kDa molecule composed of two $\alpha_1(I)$ chains and one $\alpha_2(I)$ chain that spontaneously forms a triple helix scaffold when at a neutral pH and 37°C.

Applications :

- ◆ Cell attachment
- ◆ Cell Growth
- ◆ Cell Differentiation
- ◆ Cell Migration
- ◆ Tissue morphogenesis

Source : Rat tail tendons

Description	Cat.#	Qty
Cultrex® Rat Collagen I	FX7200	100 mg

Cultrex® Bovine Collagen I

Bovine Type I collagen is the major structural component of extracellular matrices found in connective tissues and internal organs, but is most prevalent in the dermis, tendons, and bone. It is a 300 kDa molecule composed of two $\alpha_1(I)$ chains and one $\alpha_2(I)$ chain that spontaneously forms a triple helix scaffold when at a neutral pH and 37°C.

Applications :

- ◆ Cell attachment
- ◆ Cell Growth
- ◆ Cell Differentiation
- ◆ Cell Migration
- ◆ Tissue morphogenesis

Source : Fetal bovine extensor tendons

Description	Cat.#	Qty
Cultrex® Bovine Collagen I	FX7220	100 mg

Cell Biology - Culture

Cell Culture reagents

Cultrex® 3D Culture

3-D Culture is an innovative approach to modeling the morphological effects of early oncogenesis on glandular epithelial cells. When healthy, these cells exhibit a structured, polarized morphology that is critical for cellular formation and function. During carcinoma development, cell cycle controls associated with cellular development, proliferation and death are lost, and as a result, these ascaric structures are disrupted. Consequently, the morphology of these structures can be used as a measure to study factors in early carcinoma development.

Cultrex® 3D Culture Matrix™ BME

The 3-D Culture Matrix provides the foundation for glandular epithelial cells to grow in three dimensions allowing for the formation of ascaric structures in vitro. Components : Reduced Basement Membrane Extract without phenol red.

Description	Cat.#	Qty
Cultrex® 3-D Culture Matrix™ BME	FX7270	15 ml

Cultrex® 3D Culture Matrix™ Laminin I

The 3-D Culture Matrix™ Laminin I may be used as a gel on which to grow cells or a media additive alone or in concert with other basement membrane components to study cellular growth and differentiation in three dimensions in vitro.

Preparation : 3-D Culture Matrix™ Laminin I is provided in DMEM medium containing 10 µg/ml gentamycin sulfate and no phenol red at a concentration of ~ 3mg/ml.

Description	Cat.#	Qty
3-D Culture Matrix™ Laminin I	FX7280	5 ml

Cultrex® 3D Culture Matrix™ Rat Collagen I

The 3-D Culture Matrix™ Rat Collagen I may be used as a gel on which to grow cells or a media additive alone or in concert with other basement membrane components to study cellular growth and differentiation in three dimensions in vitro.

Preparation : 3-D Culture Matrix™ Rat Collagen I is provided in 20 mM acetic acid without phenol red at a concentration of 5 mg/ml.

Description	Cat.#	Qty
3-D Culture Matrix™ Rat Collagen I	FX7290	100 mg

Cultrex® Poly-L-Lysine

Poly-L-Lysine, a highly positively charged amino acid chain, is commonly used as a coating agent to promote cell adhesion in culture. This solution is provided ready to use at 0.01% and contains polymers in the 70 000-150 000 kDa range.

Applications : Substrate for cell culture adhesion.

Concentration : 0.01% in Phosphate buffered saline, sterile-filtered.

Description	Cat.#	Qty
Cultrex® Poly-L-Lysine	794511	100 ml

Cultrex® Cell Recovery Solution

Cultrex Cell Recovery Solution is a proprietary non-enzymatic solution that depolymerizes Cultrex Basement Membrane Extract (BME) at 2-8°C.

Applications : It is a ready-to-use solution to recover cells from BME for further analysis or replating

Description	Cat.#	Qty
Cultrex® Cell Recovery Solution	FX7190	100 ml

Media components

Description	Cat.#	Qty
Agar	N14570	500 g
Agar	N14571	1 kg
Agar	N14572	2.5 kg
Beef extract	N12120	50 g
Calcium chloride	466140	100 ml
Calcium chloride	466141	500 ml
Casamino acids	N14690	100 g
Casamino acids	N14691	500 g
Casamino acids	N14692	1 kg
D-fructose	05013H	1 kg
D-fructose	05013J	2.5 kg
D-fructose	05013K	5 kg
D(+)-galactose	N12890	100 g
D(+)-galactose	N12891	250 g
D(+)-galactose	N12892	500 g
D-glucose anhydrous	402500	1 kg
D-glucose anhydrous	402501	2.5 kg
Glucose 20% sterile solution	12714A	100 ml
Glycerol	047620	1 L
Glycerol	047621	4 L
Glycerol 20% sterile solution	127613	100 ml
Magnesium chloride 1M (sterile solution)	899140	100 ml
Magnesium chloride 1M (sterile solution)	899141	500 ml
Malt extract	N14780	100 g
Malt extract	N14781	500 g
Malt extract	N14782	1 kg
Maltose, monohydrate	N13320	100 g
Maltose, monohydrate	N13321	500 g
Maltose, monohydrate	N13322	1 kg
Peptone 140 (soytone)	N14670	500 g
Peptone 140 (soytone)	N14671	1 kg
Peptone, bacteriological	N14560	100 g
Peptone, bacteriological	N14561	500 g
Peptone, bacteriological	N14562	1 kg
Sodium chloride 99,5%	896780	500 g
Sodium chloride 99,5%	896781	1 kg
Sodium chloride 99,5%	896782	5 kg
Sodium chloride 5M (sterile solution)	759031	100 ml
Sodium chloride 5M (sterile solution)	759030	500 ml
Tryptone	546252	500 g
Tryptone	546253	1 kg
Yeast extract, bacteriological	N14680	100 g
Yeast extract, bacteriological	N14681	500 g
Yeast extract, bacteriological	N14682	1 kg
Yeast nitrogen base without amino acids	N14030	100 g
Yeast nitrogen base without amino acids	N14031	500 g
Yeast nitrogen base without amino acids	N14550	100 g

Specification :

Agar

Bacteriological grade
 loss on drying (%) : 10
 Gel strength (1.5 % g/cm²) : 550-650
 pH (1.5 %) : 6.5 - 7.5
 melting range : (°C) : 84 - 88

Peptone 140 (soytone)

Bacteriological grade
 pH (2 % water) at 25°C : 6.5 - 7.5
 Loss on drying (%) : 5
 Microbiological analysis

Amino acids

Proteins are large biomolecules that are present in every living organism. All proteins are chemically similar since all are made up of many amino acid units linked together in a long chain. Amino acids are the building blocks from which all proteins are made of. They are bifunctional which means that amino acids contain both a basic amino group and an acidic carboxyl group.

Amino Acid	3 Letters Code	Class	Cat.#	Qty
Alanine	Ala	Aliphatic	N12110	100 g
Alanine	Ala	Aliphatic	N12111	500 g
Arginine	Arg	Basic	N13180	100 g
Arginine	Arg	Basic	N13181	500 g
Asparagine	Asn	Amide	N13340	100 g
Asparagine	Asn	Amide	N13341	500 g
Aspartic acid	Asp	Acidic	N12200	500 g
Aspartic acid	Asp	Acidic	N12201	1 Kg
Cysteine	Cys	Sulfhydryl	009797	1 Kg
Glutamic acid	Glu	Acidic	N12550	1 Kg
Glutamic acid	Glu	Acidic	N12551	2.5 Kg
Glutamine	Gln	Amide	N12500	500 g
Glutamine	Gln	Amide	N12501	1 Kg
Glycine	Gly	Aliphatic	01822L	1 Kg
Glycine	Gly	Aliphatic	01822M	5 Kg
Histidine	His	Basic	N13901	100 g
Histidine	His	Basic	N13902	500 g
Isoleucine	Ile	Aliphatic	N13890	25 g
Isoleucine	Ile	Aliphatic	N13891	100 g
Leucine	Leu	Aliphatic	N13921	100 g
Leucine	Leu	Aliphatic	N13922	250 g
Lysine	Lys	Basic	N12590	100 g
Lysine	Lys	Basic	N12591	500 g
Methionine	Met	Sulfur	N13881	100 g
Methionine	Met	Sulfur	N13882	500 g
Phenylalanine	Phe	Aromatic	N13281	100 g
Phenylalanine	Phe	Aromatic	N13282	500 g
Proline	Pro	Imino	N13931	100 g
Proline	Pro	Imino	N13932	500 g
Serine	Ser	Hydroxyl	N13301	100 g
Serine	Ser	Hydroxyl	N13302	500 g
Threonine	Thr	Hydroxyl	N13911	100 g
Threonine	Thr	Hydroxyl	N13912	500 g
Tryptophan	Trp	Aromatic	N13871	100 g
Tryptophan	Trp	Aromatic	N13872	500 g
Tyrosine	Tyr	Aromatic	N13941	100 g
Tyrosine	Tyr	Aromatic	N13942	500 g
Valine	Val	Aliphatic	N13291	100 g
Valine	Val	Aliphatic	N13292	500 g

Asx, B = Asparagine or Aspartic Acid Glx, Z = Glutamine or Glutamic Acid

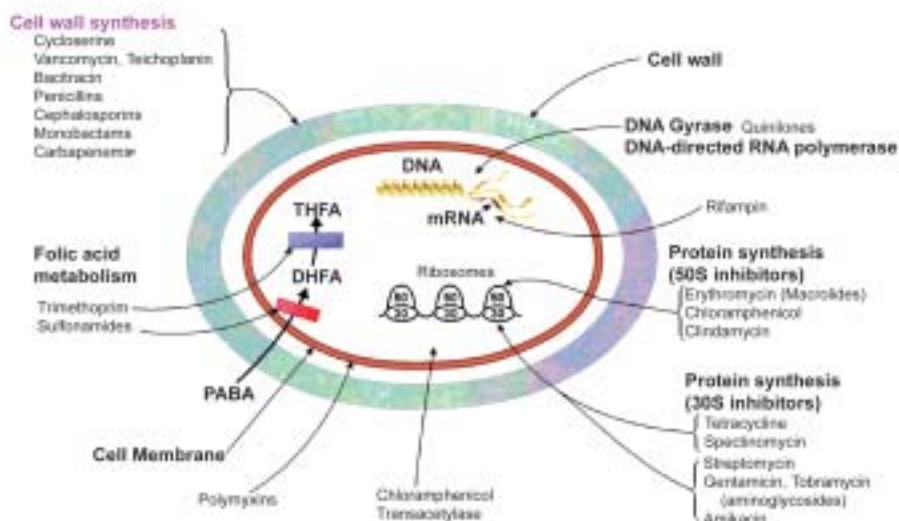
E.10

Technical tip

In vitro culturing of bacterial and animal cells is a daily task in many laboratories. To ensure successful growth of your cells, it is essential to eliminate non-target bacterial strains and fungi. Antibiotics and antimycotics function in many ways to select against unwanted organisms while maintaining the health and vitality of the desired cells. Most vectors, whether plasmid or phage DNA, harbor genes encoding resistance to antibiotics. They are identified by the ability from the host bacteria to grow in the presence of the antibiotic.

Antibiotics, Antimycotics

To help with your cell culture needs, Interchim offers an extensive line of common antibiotics and antimycotics, high quality powder blends, and special antibiotic solutions. Liquid media containing antibiotics are typically prepared by adding the antibiotic solution to freshly autoclaved media cooled below 50°C. Antibiotic solutions can also be plated directly onto agar plates and spread evenly across the surface. Liquid media and agar plates containing antibiotics should be stored at 4°C for no longer than 30 days to maintain their effectiveness. Unless otherwise stated, all antibiotic solutions can be prepared in distilled water, sterile filtered and stored at -20°C.



Antibiotics Solutions (irradiated, formulated)

Interchim offers special antibiotics solutions. These antibiotics and antimycotic mixtures have been aseptically prepared from the highest quality materials available and are γ -irradiated to ensure sterility. The dry blends or lyophilized powders are packed in amber serum vials with multiple injection stoppers for syringe mediated liquid handling. Also, each reagent has been tested for compatibility with standard tissue culture systems and is guaranteed sterile upon arrival. The end user simply needs to reconstitute the powder in the recommended volume of sterile tissue culture grade water.

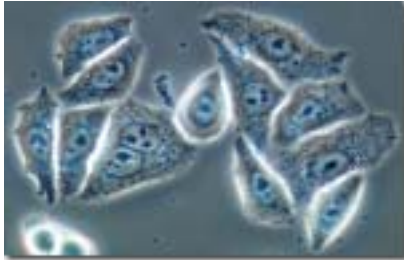
Description	Cat.#	Qty
Amphotericin B, Solubilized γ -Irradiated	N13440	100 mg
	N13441	1 g
Ampicillin, Sodium Salt, γ -Irradiated 10 mg/ml	314170	20 ml
G418 antibiotic solution 100 mM	N14650	20 ml
Gentamycin 50 mg/ml solution	N13840	20 ml
Kanamycin Sulfate 25 mg/ml solution	N13790	20 ml
Kanamycin Sulfate 50 mg/ml solution	N13800	20 ml
Neomycin, γ -Irradiated 10 mg/ml	172170	20 ml
Nystatin, γ -Irradiated 5 mg/ml	N13470	10 ml
Penicillin G, Sodium Salt, γ -Irradiated 10000 U/ml	N13480	20 ml
Penicillin/Streptomycin, γ -Irradiated 10000 U/ml/10 mg/ml	409960	20 ml
Penicillin/Streptomycin/Amphotericin B, γ -Irradiated 10000 U/ml/10 mg/ml/250 μ g/ml	N13490	20 ml
Penicillin/Streptomycin/Neomycin, γ -Irradiated 5000 U/ml/5 mg/ml/10 mg/ml	N13500	20 ml
TetraCycline Hcl, 50 mg/ml solution	N13780	20 ml

How to use Antibiotic solutions ?

Penicillin/Streptomycin/Amphotericin B
When reconstituted in 20 ml sterile dH₂O, each vial contains 10 000 U penicillin, 10 mg streptomycin and 25 μ g amphotericin B per ml. You just have to add it to your culture medium at the desired concentration.

Cell Biology - Culture

Cell Culture reagents



Antibiotics powders

Actinomycin D

Complexes with DNA, inhibits RNA synthesis (DMSO)

Description	Cat.#	Qty
Actinomycin D	N14430	5 mg

Amphotericin B

Alters membrane permeability

Description	Cat.#	Qty
Amphotericin B	550733	250 mg
	550730	500 mg
	550731	1 g

Ampicillin

Interferes with formation of bacterial cell wall

Description	Cat.#	Qty
Ampicillin, Trihydrate	231350	50 g
	231354	100 g
	231355	500 g
Ampicillin, Sodium Salt	854331	25 g
	854332	100 g

Bacitracin Zinc

Inhibitor of protein disulfide, and a peptide inhibitor

Description	Cat.#	Qty
Bacitracin Zinc	GS3090	500 kU

Carbenicillin, Disodium salt

Synthetic derivative of Penicillin

Description	Cat.#	Qty
Carbenicillin, Disodium salt	383882	250 mg
	383883	1 g

Chloramphenicol

Inhibits protein synthesis at peptidyltransferase

Description	Cat.#	Qty
Chloramphenicol	09142A	100 g
	09142B	500 g

Chlortetracycline Hydrochloride

Inhibits transfer of activated amino acids to growing polypeptide chain

Description	Cat.#	Qty
Chlortetracycline Hydrochloride	192527	5 g
	192528	25 g

Cycloheximide

Inhibits protein synthesis in eukaryotes but not in prokaryotes

Description	Cat.#	Qty
Cycloheximide	009248	100 mg
	009246	1 g

D-Cycloserine

Inhibits cell wall biosynthesis

Description	Cat.#	Qty
D-Cycloserine	09200D	1 g

Erythromycin

Inhibits protein synthesis at transpeptidation step

Description	Cat.#	Qty
Erythromycin	090810	10 g
	090811	50 g

G418 (Geneticin)

Agent for an aminoglycoside Selection similar to gentamycin

Description	Cat.#	Qty
G418 (Geneticin)	N13960	100 mg
	N13961	1 g
	N13962	5 g

Gentamycin Sulfate

Binds to the 30S subunit of bacterial ribosome

Description	Cat.#	Qty
Gentamycin Sulfate	281020	5 g
	281021	10 g

Hygromycin B

Blocks peptide synthesis, inhibits chain elongation

Description	Cat.#	Qty
Hygromycin B	N14420	100 mg

Kanamycin Sulfate

Binds to the 70S subunit of bacterial ribosome

Description	Cat.#	Qty
Kanamycin Sulfate	308661	10 g
	308662	25 g
	308663	100 g

Leptomycin B

Potent, specific inhibitor of nuclear export signal (NES)-dependent protein export from the nucleus

Description	Cat.#	Qty
Leptomycin B	GS7770	5 mg

Mitomycin C

Inhibits nucleic acid synthesis

Description	Cat.#	Qty
Mitomycin C	N14380	2 mg

Monensin, Sodium Salt

DNA synthesis inhibitor

Description	Cat.#	Qty
Monensin, Sodium Salt	GS3371	500 mg
	GS3370	1 g

Mycophenolic Acid

Inhibits Inosinate dehydrogenase (MeOH)

Description	Cat.#	Qty
Mycophenolic Acid	N14360	100 mg

Nalidixic Acid

Inhibits DNA gyrase

Description	Cat.#	Qty
Nalidixic Acid	N12980	50 g
	N12981	250 g

Neomycin Sulfate

Cell Biology - Culture

Cell Culture reagents

Causes miscoding during protein synthesis

Description	Cat.#	Qty
Neomycin Sulfate	423684	25 g
	423685	100 g

Netropsin

Inhibits protein synthesis by binding dsDNA

Description	Cat.#	Qty
Netropsin	N14390	25 mg

Nystatin

Alters membrane permeability

Description	Cat.#	Qty
Nystatin	N12542	5 MU
	N12541	25 M U

Penicillin G

Interferes with synthesis of bacterial cell wall

Description	Cat.#	Qty
Penicillin G	N12270	100 x MU
	N12271	1 x Billiards Units

Plicamycin (Mithramycin)

Inhibitor of RNA synthesis

Description	Cat.#	Qty
Plicamycin (Mithramycin)	N12960	1 mg
	N12962	5 mg

Polymyxin B Sulfate

Interferes with cytoplasmic membrane

Description	Cat.#	Qty
Polymyxin B Sulfate	N12400	25 MU
	N12401	100 MU

Puromycin, Dihydrochloride

Inhibits protein synthesis

Description	Cat.#	Qty
Puromycin, Dihydrochloride	N14370	25 mg

Streptomycin Sulfate

Binds to the 30S subunit of bacterial ribosome

Description	Cat.#	Qty
Streptomycin Sulfate	224965	50 g
	224966	100 g
	224969	500 g

Tetracycline, Hydrochloride

Blocks tRNA binding to the 30S subunit

Description	Cat.#	Qty
Tetracycline, Hydrochloride	259167	25 g
	259168	100 g

Tobramycin

Inhibits Myeloperoxidase –dependent oxidant cell injury

Description	Cat.#	Qty
Tobramycin	409805	100 mg

Vancomycin, Hydrochloride

Amphoteric glycopeptide that inhibits bacterial cell wall synthesis and RNA synthesis

Description	Cat.#	Qty
Vancomycin, Hydrochloride	N13270	100 mg
	N13271	250 mg
	N13272	1 g
	N13273	5 g

MediaKap® Hollow Fiber Media Filters

Sterilize 5 liters of DMEM with 10% fetal bovine serum in 20 minutes or less !

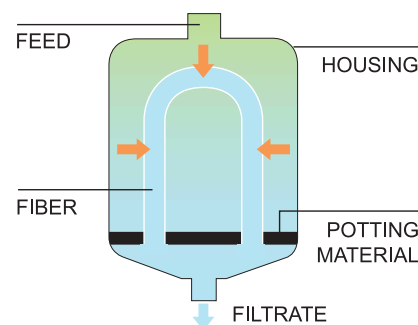
Hollow fiber membranes work in exactly the same fashion as the flat sheet membrane, but :

- ◆ Filter takes less (a)
- ◆ Filter do no colapse as flat filters
- ◆ Flow through is higher (c)
- ◆ Do not need to vent (b)
- ◆ No vent contamination (b)

(a) Hollow fiber membranes can pack more surface area into a given module than the flat sheet manufactures. As an example, one of the more popular small volume media filters on the market has a flat sheet membrane wrapped into a cylinder and contains 10 cm² of surface area.

(b) The fiber bundle in each MediaKap® contains one hydrophobic fiber which acts as a downstream vent. When air gets into the line, it passes harmlessly downstream instead of filling the housing and blocking flow. Because it's automatic, you won't have to remember to manually vent the filter as is necessary in flat disc filters. Also the vent fiber is 0.2 µm so the air passing downstream is sterile and will not contaminate the downstream filtrate.

(c) Typically, the MediaKap® 5 will filter 5 liters of DMEM in about 15 minutes. The MediaKap® 5 Plus will filter 5 liters of DMEM with 10% fetal bovine serum in about 20 minutes. The MediaKap® 10 has a surface area of 100 cm². Because the hollow fiber does not require a downstream support structure, hollow fiber membranes have higher rates than flat sheet membranes.



The MediaKap® series contain standard fiber and are designed for media without serum and aqueous buffer solutions. The MediaKap® Plus series contain a high performance fiber which have significantly greater throughput for use of media with serum and partially soluble nutrients (i.e. soy broth, BSA, yeast extract). Filtration takes place through the wall of the fiber and the filtrate is passed through the lumen (inside diameter) of the fiber.

MediaKap® Hollow Fiber Filters

(for media without serum and aqueous buffer solutions)

Description	Cat.#	Surface Area	Filling Bell	Filters/pkg
MediaKap® - 2	238130	35 cm ²	Yes	12
MediaKap® - 2	237580	35 cm ²	No	18
MediaKap® - 5	292710	70 cm ²	Yes	12
MediaKap® - 5	289970	70 cm ²	No	18
MediaKap® - 10	295220	100 cm ²	Yes	12
MediaKap® - 10	294680	100 cm ²	No	18
MediaKap® - 25	298550	144 cm ²	Yes	6
MediaKap® - 50	298820	185 cm ²	Yes	3

MediaKap® Hollow Fiber Filters

(for media without serum and aqueous buffer solutions)

Description	Cat.#	Water Flow	DMEM w/serum	DMEM w/o serum
MediaKap® - 2 Plus	307450	400ml/min	0.2-2L	5L
MediaKap® - 2 Plus	307050			
MediaKap® - 5 Plus	308720	750ml/min	2-5L	10L
MediaKap® - 5 Plus	308640			
MediaKap® - 10 Plus	G98750	1000ml/min	5-10L	20L
MediaKap® - 25	298550			
MediaKap® - 25 Plus	312030	1400ml/min	10-25L	50L
MediaKap® - 50 Plus	312150	2000ml/min	25-50L	100L

Technical tip

Protease inhibitors in cell culture

- ◆ The **culture media**, prepared or purchased, are classically autoclaved, cooled to 50°C, then supplemented with antibiotic solutions.
- ◆ Antibiotic solutions may be applied by vaporisation directly onto agar petridishes, or included in agar gel preparation.
- ◆ Most vectors, both DNA plasmides and phages, and hybridoma, contain genes encoding for antibiotic resistance. The resistance identifies the vectors, and confer the resistance to the hosting cell (bacteria or mamalian cell), and permit the positive selection of transfected cells: antibiotic and antifungic agents block, or kill undesired organism, but don't affect the cultivated cell.

Technical tip

Proteolysis challenges in biochemistry

Proteases are ubiquitous enzymes in every cell of all organisms. They are released by cells during their disruption, and quickly degrade any protein. When one wants to recover or detect a given protein, protease inhibition is thus required to save the yield and the quality of the protein. Protease inhibitors are also usefull to protect bioactive proteins during further analysis (western blotting, immunoprecipitation, bioassays, reporter analysis...), purifications steps (chromatography, long term dialysis), and storage.

Uptima recommends that protease inhibitors with broad specific activity are added to all stock buffers and solutions, and not only in initial purification step, because most inhibitor have reversible activity. A classic complete association is 3 mg antipain, 0.5 mg Bestatin, 1 mg chymostatin, 3 mg E-64, 0.5 mg pepstatin, 3 mg phosphoramidon, 20 mg AEBSF, 0.5 mg aprotinine and 10 mg EDTA. EDTA may be avoided if metalloproteases are not a concern, notably in applications where divalent metals are needed (polyHist tagged recombinant affinity purification, enzymes with cofactors...).

Proteases Inhibitors

Interchim provides high quality protease inhibitors for cell culture requirements, as well as for other purposes (to preserve protein during storage, solubilization extraction and purification procedures, or during protein analysis... See technical tip). Several ones are available in proteomics grade, as well cocktails (E19).

- ◆ In vitro culture of animal cells
- ◆ In vitro culture of bacteria
- ◆ In vitro culture of hybridoma (monoclonal antibody production)...
- ◆ In vitro culture of vectors (recombinant protein production)

Selection guide

Protease inhibitor

Different types of proteases exist. **Serine proteases** are present in almost all cells, dominating with **cysteine proteases** in plants, or with **metalloproteases** in bacteria, or with both in animal tissues. Occasionally, **aspartic proteases** can interfere too in animal tissus isolations notably when a low pH is required. The table below indicates most important general inhibitors dedicated to these proteases types, and inhibiting notably commonly found non-specific proteases. Please refer to each inhibitor descriptions and to the table 'other serine protease inhibitors' for the detailed protease specificities that are required in special applications.

Proteases

Serine proteases

- ◆ chymotrypsin
- ◆ trypsin
- ◆ kallikrein
- ◆ plasmin
- ◆ thrombin
- ◆ Subtilisin

Cysteine proteases

- ◆ papain
- ◆ calpain
- ◆ cathepsin B, H, L, S

Metalloproteases

- ◆ Ca+ metalloproteases
- ◆ MetalloEndoProteinases

Aspartic acid proteases

- ◆ Pepsin
- ◆ Renin
- ◆ Cathepsin D

Others, specific proteases

General Inhibitors

⇒ **AEBSF** is a superior serine protease inhibitor, with far lower toxicity than conventional PMSF and DFP

See also : Aprotinin, E-64, Leupeptin, PMSF

⇒ **antipain** and **E64**

See also : Leupeptin

EDTA

Pepstatin

Refer to individual descriptions

Protease Inhibitors powders

	Cat. #	Qty	M.W	Comment
Ac-Asp-Glu-Val-H (aldehyde)	UP827070	5 mg	502.5	Inhibits apopain/ CPP32/Yama
Ac-Tyr-Val-Ala-Asp-H (aldehyde)	UP827080	5 mg	492.5	Inhibits ICE and related enzymes
Ac-Tyr-Val-Lys-Asp-H (aldehyde)	UP827090	5 mg	549.6	Inhibits ICE and related enzymes
AEBSF	UP401070	100 mg	239.7	Non toxic and more potent serine protease inhibitor, more soluble and stable, than PMSF and DFP 4-(2-aminoethyl)benzeneSulfonyl Fluoride. See page.E18.
Antipain HCl	UP257317	5 mg	677.6	Inhibits reversibly cysteine and serine proteases (trypsin, papain, cathepsin A and B). Working range is 1-100 μ M (50 μ g/ml = 74 μ M)
Aprotinin	UP185582	10 mg	651.2	Inhibits competitively and reversibly serine proteases (chymotrypsin, trypsin, kallikrein, plasmin). Working range is 0.06 - 2.0 μ g/ml (0.01 - 0.3 μ M)
	UP185586	50 mg		
Benzamidin	003051	25 g	156.6	inhibits competitively trypsin-like serine proteinases including trypsin (Ki=18 μ M), thrombin, plasmin. Suggested final concentration : 1 mM.
Bestatin	UP300991	10 mg	308.4	Inhibits competitively aminopeptidases, especially aminopeptidase B, leucine aminopeptidase and tripeptide aminopeptidase, but not carboxypeptidases. Working range is 1-40 μ M. Soluble in Methanol
Elafin (Human)	UP831970	20 μ g	599.9	Inhibits elastase from human skin
Leupeptin	UP827721	5 mg	463	Inhibits reversibly cysteine and serine proteases (trypsin, plasmin, papain, kallikrein, thrombin, cathepsin A,B). Working range is 1-100 μ M
	UP827724	25 mg		
1,10- phenanthroline	N12740	10 g	198.2	Reversible inhibitor of metallo-proteinases and of metal activated proteinases (Ki=6.3 μ M for Angiotensin-Converting-Enzyme, Ki= 40 μ M for thermolysin, Ki=50 μ M for astacin). Soluble in methanol, ethanol or DMSO (Stock solution : 200 mM). Suggested final concentration: 1-10 mM
	N12741	50 g		
Pepstatin	UP827752	25 mg	685.9	Inhibits aspartic acid proteases (pepsin, renin, cathepsin D) and also HIV protease. Useful range is 0.7 μ g/ml (1 μ M). Soluble in DMSO, Methanol
Phosphoramidon	UP348115	5 mg	543.5	Inhibits collagenase, thermolysin and metalloendoproteinases. Working range is 4 - 330 μ g/ml (7 -570 μ M)
PefaBloc SC				See AEBSF, page A18
PMSF	UP147376	5 g	174.2	Phenyl Methyl Sulfonyl Fluoride Inhibits irreversibly serine proteases (trypsin, chymotrypsin, kallikrein, subtilisin, thrombin) and also cysteine protease papain. Soluble in Ethanol, Methanol. Working range is 17 - 170 μ g/ml (0.1-1 mM)
	UP147374	25 g		
Trypsin inhibitor	UP158624	1 mg		From Soybean, immobilized. Inhibits trypsin and trypsin-like proteases (chymotrypsin and elastase)
CA-074	UP827130	5 mg	384.4	Inhibits cathepsin B D. Inubushi et al., 1994, Biochem. Biophys., 116,282
CA-074 Me	UP827180	5 mg	397.5	Inhibits intracellular cathepsin B D. Buttle et al., 1992, Arch. Biochem. Biophys., 299:377
Chymostatin	UP29706B	5 mg	605	Inhibits α -, β -, γ -, δ -Chymotrypsin, and also many other cysteine proteases (papain)
E-64	UP789581	5 mg	357.4	Inhibits irreversibly cysteine proteases (papain, calpain, cathepsin B,H,L,S). Working range is 6 - 60 μ g/ml (10 - 100 μ M)
E-64-c	UP827140	5 mg	314.38	Inhibits thiol proteases (Cathepsin B/H/L, Calpain)
E-64-d	UP827190	5 mg	342.44	Membrane permeable analog of E.64c
EDTA	UP036290	1 kg	372.2	Inhibits reversibly metalloproteases by chelating metal ions cofactors Working range is 1-10 μ M Disodium salt
	UP03629A	100 g		
EGTA	UP10075A	10 g	380.4	Inhibits reversibly metalloproteases by chelating calcium ions cofactors
Z-Asp-CH ₂ -DCB	UP831910	5 mg		
Z-Ile-Glu(OBut)-Ala-Leu-H (aldehyde) [PSI]	UP831920	5 mg	618.7	Inhibits proteasomes
Z-Leu-Leu-H (aldehyde)	UP831930	5 mg	362.5	Inhibits calpains. Working range is > 10 μ M
Z-Leu-Leu-Leu-H (aldehyde) [M6132]	UP831940	5 mg		Inhibits proteasomes
Z-Leu-Leu-Nva-H (aldehyde) [M6115]	UP831960	5 mg		Inhibits proteasomes
Pefabloc® FG	957670	3 x 50 mg	485.5	binds with a high affinity to fibrinogen, inhibits fibrin polymerization, modifies the mechanical properties of fibrin clots and can dissociate non-stabilized fibrin gels. Readily soluble in water.

See also proteases assays (#BK9620) page E223.

Cell Biology - Culture

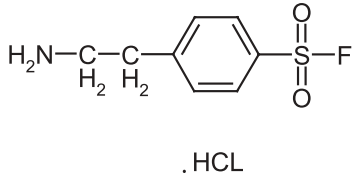
Cell Culture reagents

AEBSF

Non toxic and more potent serine protease inhibitor, more soluble and stable, than PMSF and DFP 4-(2-aminoethyl)benzeneSulfonyl Fluoride.

Description	Cat.#	Qty
AEBSF	UP401070	100 mg
MW : 239.7		

This protease inhibitor is very useful for cell biology applications, and superior to others inhibitors for following reasons :



	PMSF	DSP	AEBSF
Solubility (in water)	0.12 (a)	15.4	200
Stability	Low (b)	Mediocrus	Excellent
Inhibitor activity :	-	-	-
Trypsin/chymotrypsin	Good	Excellent	Good
Plasmatic enzymes	Good or less	Good or less	Excellent
Toxicity (relative)	300	14	1

(a) Decreases at high ionic strength - (b) Need frequent additions

Hematology protease inhibitors are available on inquire

Description	Cat.#	M.W.	Activity parameter	Trypsin	Chymotrypsin	Thrombin	Factor Xa	Factor XIa	Plasmin	sc-IPA	lc-IPA	uPA	Glandular kallikrein	Plasma kallikrein	Elastase	SubtilisinA	Acrosin	Batroxobin (B.atrox)	Irtroxobin (B.moojan)	PCa	Tryplase
AEBSF irreversible inhib. Solub.:200mg/ml	UP401070	240	IC50 [mM]	0.081	0.044	0.92	24.0	0.256	1.99	0.72		0.072	2.86		0.525	1.8					
PefaBloc SP competitive inhib. Solub. : 15 mg/ml	BM3230	243	Ki [µM]	1.6		6.5	9.4	86	60	>1000	83	29	610	1.4			0.36	350	200		0.71
PefaBlocTH competitive inhib. Solub. : 1.5 mg/ml	BH8070*	519	Ki [µM]	0.69	625	0.006	7.9	450	30		70	230	93	14.4			2.9	1.7	3.8	4.8	45
PefaBlocTH 1158 competitive inhib. Solub. : 100 mg/ml	865861*	573	Ki [µM]	0.17		0.0088	24	200	6.1	>1000		35	>1000	47						17	3.6
PefaBlocXa competitive inhib. Solub. : 200 mg/ml	971230*	469.0	Ki [µM]	16		66	0.4	180	160		27	78	890	15			3.5	290	430	61	15
PefaBlocPA/Xa competitive inhib. Solub. : 8 mg/ml	344590*	445.4	Ki [µM]	0.09		0.32	0.013	0.036	6.4	0.38	0.035	3.4	18	0.72			0.19	12	9.3	0.11	1.6
PefaBlocPL competitive inhib.	BM3210*	460.2	Ki [µM]	0.086		0.3	18	>1000	0.14		>1000	8.3	>1000	0.067						7.1	12
PefaBlocPK pH dependant inhib. Solub. : 4 mM	BM3190*	487.0	Ki [µM]	1.3		170	31	100	10		36	17	100	0.7				5.7	11.7	79	12
PefaBlocTry acylation inhib. Solub. : 12.5 mg/ml	578000*	295	K3(min-1)/ T1/2(min)	0.108		0.0029				0.29		0.087	0.042					0.009			
				6.4		239						8.0	16.5					77			
PefaBlocTry1405	BM3220*	560.1	Ki [µM]	0.020		0.019	77	260	2.8	>1000		21	>1000	18							9
PefaBloc uPA competitive inhib.	BM3200*	650.3	Ki [µM]	0.12		0.7	1.5	25	1.0	9.5		0.54	>1000	36						3.3	
PefaBlocTryp competitive inhib.	T85290*		Ki [µM]	917.9 5.5			0.36	5.8	23	3.5	200		38	>1000	4.3					5.2	0.025
Chlorometylketone irreversible inhib. Solub. : >10µM	T85290*	620.9	K2/K1 l.mol ⁻¹ .s ⁻¹				994														
Benzamidin competitive inhib. Solub. : >10µM	003051	157	Ki [µM]	18		+			+												

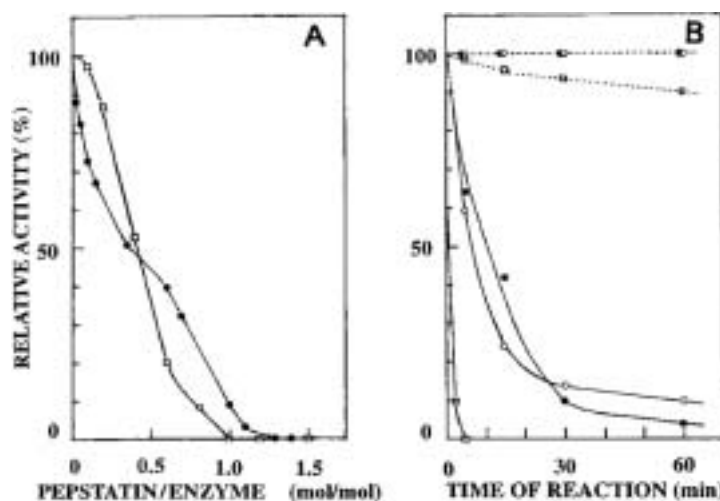
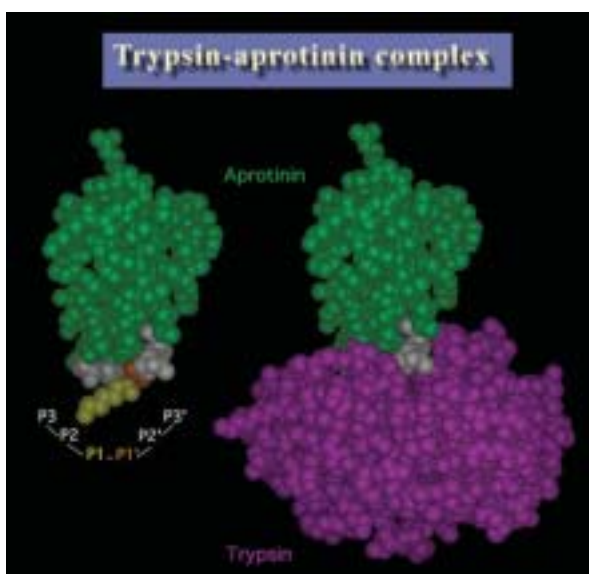
See also Toxins (in biochemicals section) and Snake venoms (in hematology section)

Proteomics grade Protease Inhibitors

Following antibiotics are tested for protein application, protease free, to garanty optimal results in proteomics.

Description	Cat.#	Qty
AEBSF	GS4072	50 mg
Antipain dihydrochloride	25731C	5 mg
Aprotinin	18558D	10 mg
Aprotinin	18558E	50 mg
Benzamidine hydrochloride	003059	25 g
Benzamidine hydrochloride	00305B	50 g
Benzamidine hydrochloride	00305A	100 g
Bestatin	300995	10 mg
Chymostatin	29706D	5 mg
E-64	GS4080	5 mg
EDTA-Na2	T32141	500 g
EDTA-Na2	T32142	1 Kg
EDTA-Na2	T32143	2,5 Kg
Leupeptin	827728	5 mg
Leupeptin	827729	25 mg
Pepstatin	827754	5 mg
Pepstatin	827755	25 mg
1,10-phenathroline	GS3880	10 g
1,10-phenathroline	GS3881	50 g
PMSF	GS3920	5 g
PMSF	GS3921	25 g
Phosphoramidon	348118	5 mg
Trypsin inhibitor, soybean	N15153	1 g
Trypsin inhibitor, soybean	N15152	10 g
protease inhibitor cocktail	374723	1 ml
protease inhibitor cocktail with EDTA	374724	1 ml
protease inhibitor cocktail mamalian	AN0990	1 ml

Pro-Pure™ Protease Inhibitor Cocktail, Mammalian, is perfect for scientists doing proteomics/protein research. Our newest cocktail is made of a lyophilized powder of protease inhibitors for mammalian cell use and contains the following inhibitors: AEBSF, Aprotinin, E-64, Bestatin, Leupeptin, and Pepstatin. All of our protease inhibitor cocktails, including the newest, are made up of a very stable blend that inhibits the spectrum of proteases. All are convenient and easy-to-use.



(A) Pepstatin inhibition of nepenthesin I (●) at pH 3.0. Inhibition of porcine pepsin A (□) by pepstatin was also examined under the same conditions. (B) DAN inhibition of nepenthesin I in the presence (---) and absence (—) of cupric ions and of nepenthesin II in the presence (---) and absence (—) of cupric

Cell Biology - Culture

Cell Culture reagents

Technical tip

Hybridoma and growth factors

Myeloma and hybridoma are tumoral cell lines that have the ability to proliferate indefinitely. However most applications require growth factors to maintain optimal growth. One important application is the production of monoclonal antibodies that are recovered in the cell culture medium. One key step in the hybridoma obtention is the cloning. That consists to obtain a culture from a unique cell. This critical step should be done rapidly after parent cells were fused. It is recommended to repeat cloning from time to time to avoid the non interesting cells development that may appear and overcome the growth of the right cell line (producing the desired specific antibody).

Many works tried to improve cell culture media and supplements.

To promote the optimal growth of hybridoma, cell culture media should be supplemented with cytokines and Foetal Calf Serum (FCS). However added proteins often interfere with further treatment, like antibody purification.

Macrophages feeders are frequently used in hybridoma cloning, but their preparation is a hassle and gives tedious or variable results.

Now, Hybridokine is a fantastic breakthrough for hybridoma culture

Growth factors

Hybridokine

- Efficient for the stabilization and growth of hybridoma of

- ◆ mouse / mouse (X63, SP2/0, NS1)
- ◆ rat / rat (Y3)
- ◆ mouse / human
- ◆ mouse / rat

- Enhances cloning yield up 80%

- Helps the culture of cryo-protected cells culture

The "Hybridokine" (Hybridoma cloning enhancing factor) is a growth factor that is obtained in culture media for continuous culture of a human tumoral cell line (ES1, a strain of Ewing sarcoma). It contains potent growth factors that allow and accelerates cells growth, even of a unique cell. It is a mixture whose main activity relay on an undefined cytokine, and Interleukine 6.

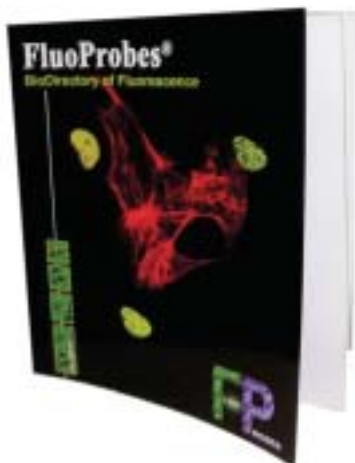
Note : The Hybridokine is not used in place of serum, thus the cloning medium should be supplemented with FCS.

Hybridokine is an efficient and economical tool for the cloning of many hybridoma strains : mouse / mouse (X63, SP2/0, NS1) ; rat / rat (Y3) ; mouse / human ; mouse / rat ; Hybridoma obtained from other species were not assayed at this time. It also helps cells to grow again after a cryo-storage, and for in vitro immunizations.

Hybridokine™ can replace feeder cells completely and is thus a **very useful factor to supplement media for developing, cloning and culturing of hybridomas.**

Hybridokine is offered sterile and lyophilized, stable 2 years.

Description	Cat.#	Qty
Hybridokine	UP826430	12.5 ml



+ 5500 items / 480 pages

- ◆ Cell Biology Probes (Chap I)
- ◆ Fluorescent Labeling (Chap II)
- ◆ Fluorescent Immunologicals (Chap III)
- ◆ Fluorescent Genetic Tools (Chap IV)
- ◆ Other Fluorescent Tools (Chap V)
- ◆ Custom Services (Chap VI)

gathering the Best of the Fluorescence

FREE Technical Support Center ...
take the benefit of our Fluorescence knowledge.

Cultrex® Human Epidermal Growth Factor (EGF)

EGF is a potent growth factor that stimulates the proliferation of various epidermal and epithelial cells and has been implicated in wound healing and gastric secretion inhibition. EGF is activated through a receptor known as c-erbB, which is a class I tyrosine kinase receptor. This receptor also binds with TGF-alpha and VGF (vaccinia virus growth factor). Recombinant human EGF is expressed in *E. coli* as a 6.2 kDa globular protein containing 53 amino acid residues, including 3 intramolecular disulfide-bonds.

Description	Cat.#	Qty
Cultrex® Human Epidermal Growth Factor (EGF)	FX7230	50 µg

Cultrex® Fibroblast Growth Factor-2 (FGF-2)

FGF-2 is a potent growth factor that promotes cellular proliferation and differentiation and that has been implicated in prenatal development, postnatal growth, and tissue regeneration. FGF-basic is a non-glycosylated heparin binding growth factor that is expressed in the brain, pituitary, kidney, retina, bone, testis, adrenal gland liver, monocytes, epithelial cells and endothelial cells, and activation of FGF-2 occurs through FGFR 1b, 1c, 2c, 3c and 4. Dramatic amplification of angiogenesis has been observed as a synergistic effect when used in concert with VEGF. Recombinant human FGF-2 is expressed in *E. coli* as a 17.2 kDa protein consisting of 154 amino acid residues.

Description	Cat.#	Qty
Cultrex® Fibroblast Growth Factor-2 (FGF-2)	FX7240	5 µg

Cultrex® Murine Vascular Endothelial Growth Factor (VEGF)

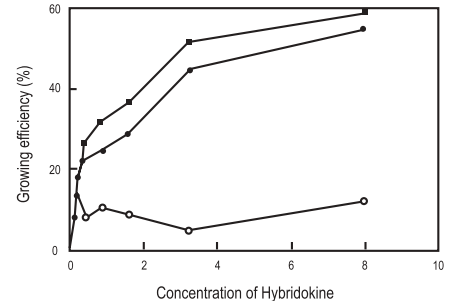
VEGF is a powerful growth factor that stimulates cellular proliferation and survival of endothelial cells and promotes angiogenesis and vascular permeability. VEGF is expressed primarily in vascularized tissues and has been implicated in the tumor metastasis and intraocular neovascular syndromes induction. Activation occurs through three of the VEGF receptors : fms-like tyrosine kinase (flt-1), KDR gene product (the murine homolog of KDR is the flk-1 gene product) and the flt-4 gene product ; and dramatic amplification of angiogenesis has been observed as a synergistic effect when used in concert with FGF-2. Recombinant human VEGF is expressed in *E. coli* as a 38.2 kDa, disulfide-linked, homodimeric protein consisting of two 165 amino acid polypeptide chains.

Description	Cat.#	Qty
Cultrex® Murine Vascular Endothelial Growth Factor (VEGF)	FX7250	1 µg

Cultrex® Human Beta-Nerve Growth Factor (β-NGF)

β-NGF is a potent neurotrophic factor that stimulates growth and survival of neurons during development ; it has also been implicated as a growth and differentiation factor for B lymphocytes and an enhancer for B-cell survival. β-NGF is activated through its receptor beta-NGFR, and plays a crucial role in the development and preservation of the sensory and sympathetic nervous systems. Recombinant human β-NGF is expressed in *E. coli* as a noncovalently disulfide-linked homodimer, of two 13.5 kDa polypeptide monomers (238 total amino acid residues), and all three disulfide bonds are required for biological activity.

Description	Cat.#	Qty
Cultrex® Human beta-Nerve Growth Factor (β-NGF)	FX7260	2 µg



Cloning efficiency Effect of increasing concentrations of Hybridokine™ (r) and Hybridokine™ IL6-depleted with a 500-molar excess of monoclonal antibodies anti-IL6 (●) on the cloning efficiency of MB-3 cells. As a control, the effect of increasing concentrations of RPMI-medium 1640 with 8% (v/v) FBS (○) is given. Cloning efficiency has been determined as described.

Technical tip

pKa: equilibrium constant equation

$$K_a = \frac{[H^+][A^-]}{[HA]} ; pK_a = -\log K_a$$

pH: Henderson-Hasselbach equation

$$pH = pK_a + \log \frac{[A^-]}{[HA]}$$

[H-]: molar conc. of the salt (dissociated form)

[AH]: molar conc. of the undissociated acid.

Biological buffers (ACES, HEPES, MOPS...), introduced by Good, et. al. in 1966, are widely used in biotechnology, cell biology and molecular biology applications. These buffers were well received by the research community because «Good» buffers are non-toxic, easy to purify and their pKa is typically between 6.0 and 8.0, the range at which most biological reactions occur. The «Good» buffers also feature minimal penetration of membranes, minimal absorbance in the 240-700 nm range and minimal effects due to salt, concentration or temperature.

Biological buffers

Interchim provides a complete line of good's buffer products. Our biological buffers feature high assay, low heavy metals, low insolubles and nuclease and protease testing. For common buffers (sodium acetate, boric acid, potassium phosphate, and others), please refer to page E352.

Also see BIOCHEMICALS C1

Extensive Line of High Purity Buffers Specifically Formulated For Use in Biological Systems
Biological buffers are useful for cell culture in vitro, enzyme assays and some electrophoretic applications at physiological pH. Universally applicable buffers for biochemistry must be water soluble, not interfere with biological processes or biological membranes (penetration, solubilization, adsorption on surface, etc.), have known complex-forming tendency with metal ions, be non-toxic and have a very low U.V. absorption at wavelength >260 nm.

Product Description	Cat.#	Qty	Mw	Pka (@ 25°C)	Effective Ph Range (100 Mm @ 25°C)
Zwitterionic Buffers, PG					
MES free acid UltraPure	14035B	100 g	213.1	6.15	5.5-6.5
	14035C	250 g			
	14035H	500 g			
Bis-Tris UltraPure	368321	100 g	209.2	6.50	5.8-7.3
	368322	250 g			
	368323	500 g			
ADA High Purity	N13390	25 g	190.2	6.60	6.0-7.2
	N13391	100 g			
ACES High Purity	N12340	100 g	182.2	6.88	6.0-7.5
	N12341	500 g			
PIPES Sodium Salt High Purity	UP061980	100 g	335.4	6.80	6.1-7.5
	UP061981	250 g			
MOPSO free acid UltraPure	N14330	25 g	225.3	6.88	6.2-7.6
	N14331	100 g			
MOPSO Sodium Salt High Purity	N14200	25 g	247.2	6.88	6.2-7.6
	N14201	100 g			
Imadazole Biotech grade	020220	10 g	68.1	7.00	6.2-7.8
	020228	50 g			
	020229	100 g			
Imidazole Proteomics grade	BI9270	10 g			
	BI9271	50 g			
	BI9273	100 g			
BES	BA7850	100 g	213.2	7.09	6.4-7.8
	BA7851	500 g			
MOPS UltraPure	UP062000	100 g	209.3	7.20	6.5-7.9
	UP062002	500 g			
MOPSProteomics grade	06200Q	100 g			
MOPS, solution 10X	420090	100 ml			
	420091	500 ml			
MOPS Sodium Salt High Purity	N13430	25 g	231.3	7.20	6.5-7.9
	N13431	100 g			
	N13432	250 g			
MOPS, sodium salt Proteomics grade	N13433	100 g			
MOPS 10X DEPC	420090	100 ml			
	420091	500 ml			
TES Disodium Salt UltraPure	N14130	25 g	251.2	7.40	6.8-8.2
	N14131	100 g			
HEPES Free Acid High Purity	06194N	50 g	238.3	7.55	6.8-8.2
	UP061940	250 g			
	06194P	1 Kg			
HEPES Sodium Salt High Purity	349411	25 g	260.3	7.55	6.8-8.2
	349412	100 g			
	349413	500 g			
DIPSO UltraPure	28146A	25 g	243.3	7.60	7.0-8.2
	28146B	100 g			
HEPPSO Free Acid UltraPure	28147A	25 g	268.3	7.80	7.0-8.5
	28147B	100 g			
POPSO Free Acid Biotech grade	28149A	25 g	362.4	7.80	7.2-8.5
	28149B	100 g			

Product Description	Cat.#	Qty	Mw	Pka (@ 25°C)	Effective Ph Range (100 Mm @ 25°C)
POPSO Disodium SaltUltraPure	69223A	25 g	406.4	7.80	7.2-8.5
	69223B	100 g			
HEPPSUltraPure	N14320	25 g	252.3	8.00	7.3-8.5
	N14321	100 g			
TricineUltraPure	706115	100 g	179.2	8.15	7.8-8.8
	706116	250 g			
	706117	500 g			
TrisUP	UP158387	500 g	121.1	8.10	7.0-9.0
	UP158388	1 Kg			
GlycylglycineHigh Purity	01829P	100 g	132.1	8.40	7.5-8.9
	01829Q	250 g			
	01829R	1 Kg			
TAPS Free AcidHigh Purity	70501A	100 g	243.3	8.40	7.7-9.1
TAPS Sodium SaltBiotech grade	70150A	25 g	265.3	8.40	7.7-9.1
	70150B	100 g			
TAPSO	281508	25 g		7.61	7.0-8.2
AMPSO Free AcidUltraPure	61281A	25 g	227.3	9.00	8.3-9.7
	61281B	100 g			
AMPSO Sodium SaltUltraPure	60653A	25 g	249.3	9.00	8.3-9.7
	606531	100 g			
CHESUltraPure	216402	100 g	207.3	9.50	8.6-10
	216403	500 g			
CAPSO Free AcidUltraPure	62519A	25 g	237.3	9.60	8.9-10.3
	62519B	100 g			
AMP buffer cocentrateHigh Purity (a)	N12130	1L	89.1	9.70	9-10.5
	N12131	4L			
CAPSHigh Purity	06199D	250 g	221.3	10.40	9.7-11.1
	06199E	500 g			
	06199F	1 Kg			
CAPS Sodium Salt	N141500	25 g	243.3	10.40	9.7-11.1
	N141501	100 g			
Biological Buffers					
Boric Acid	07044V	500 g	61.83	pKa1 - 9.24	
	UP070440	1 Kg		pKa2 - 12.74 8.5-10.2	
	07044W	2.5 Kg		pKa3 - 13.80	
Boric Acid Proteomics Grade	10853A	500 g			
	10853B	1 Kg			
	10853C	2.5 Kg			
Citric AcidACS grade/ Biotech grade	673410	500 g	192.1		
	UP168781	1 Kg			
	673412	3 Kg			
Citric Acid Trisodium Dihydrate	218830	1 Kg	294.1	pKa1 - 3.13 2.2-6.5	
	218831	2.5 Kg		pKa2 - 4.76 3.0-6.2 pKa3 - 6.40 5.5-7.2	
Citric Acid, Trisodium Dihydrate Proteomics Grade	10853A	500 g			
	10853B	1 Kg			
	10853C	32.5 Kg			
Citric Acid, Ammonium Salt, Dibasic UltraPure	N12630	500 g	226.2		
	N12631	1 Kg			
	N12632	2.5 Kg			
Glycine	UP168781	1 Kg	75.07	pKa1 - 2.35 2.2-3.6	
	168783	2.5 Kg		pKa2 - 9.78 8.2-10.6	
Imidazole	020220	10 g	68.08	6.95	6.2-7.8
	020228	50 g			
	020229	100g			
ImidazoleProteomics grade	BI9270	10 g			
	BI9271	50 g			
	BI9273	100 g			
Succinic Acid Free Acid	N12170	500 g	118.09	pKa1 - 4.21 3.2-5.2	
	N12171	2.5 Kg		pKa2 - 5.64 5.5-6.5	

See page D1 for definition of quality grades
(a)with 5% water to maintain liquidity at room temperature)
See also mineral buffers in biochemical section, and
formulated buffers (Tris buffers as TBS), and Phosphate
buffers as PBS).