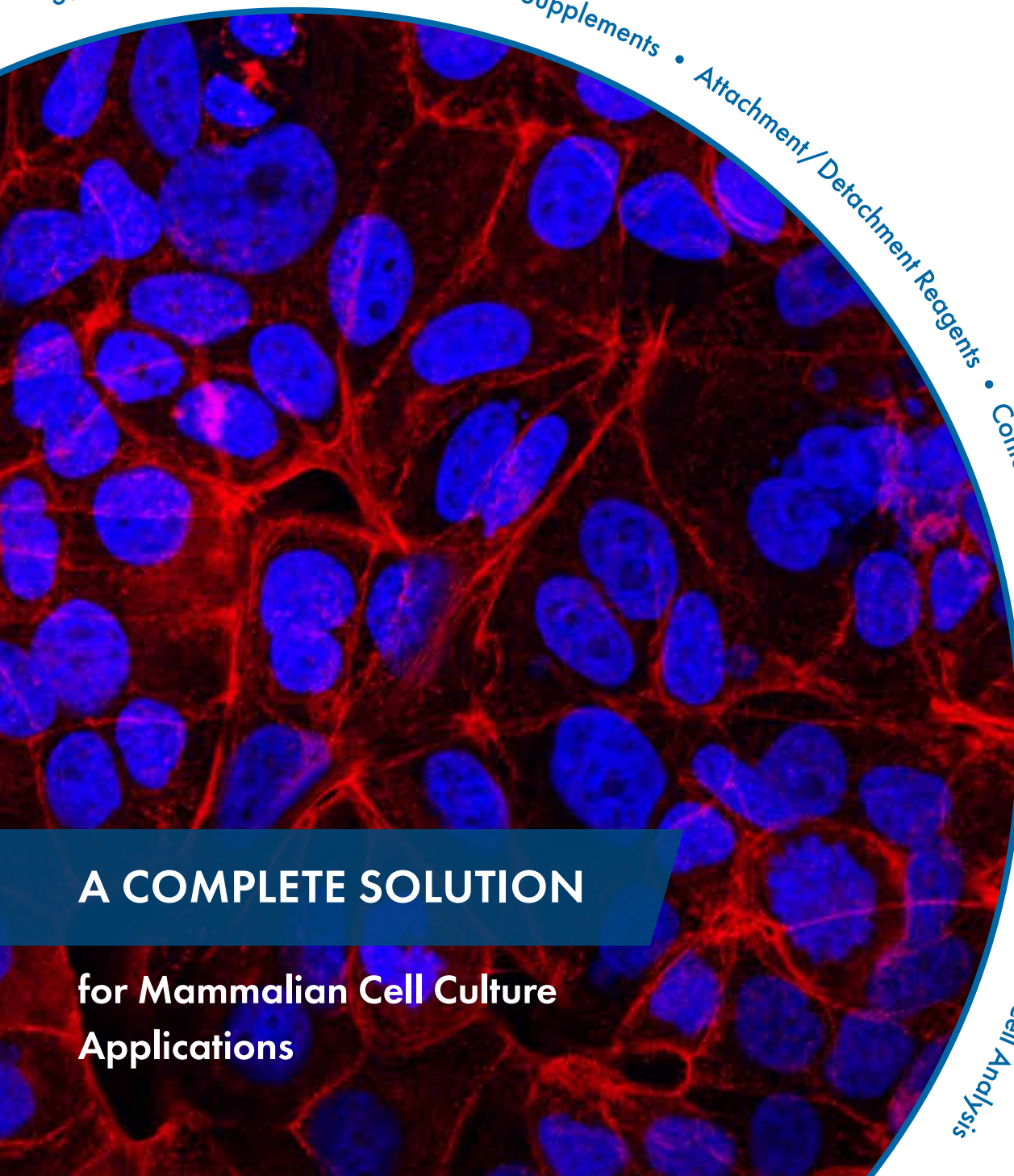


Mammalian Cell Culture Essentials

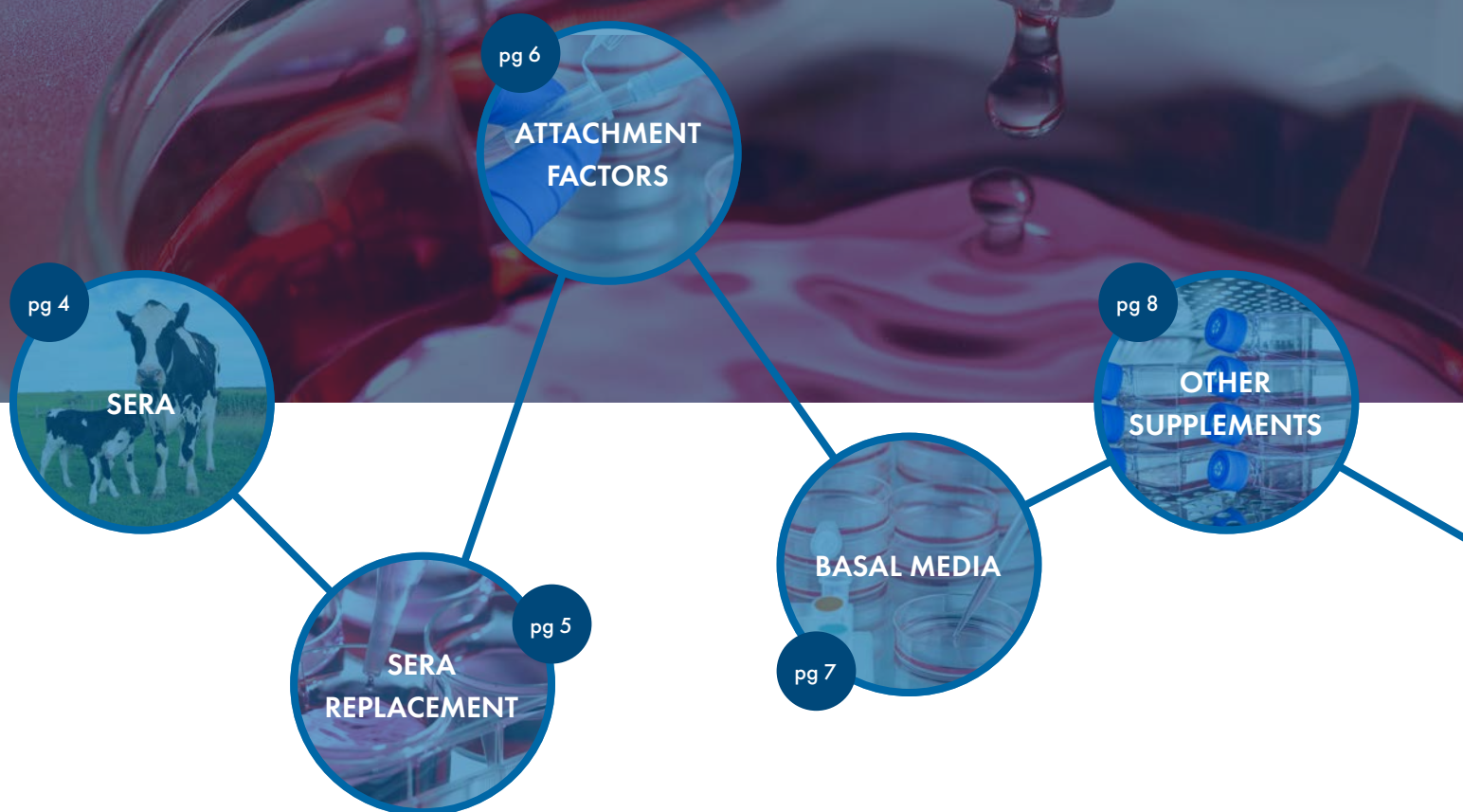
Sera • Sera Replacement • Media • Supplements • Attachment/Detachment Reagents • Contamination Control • Cell Cryopreservation • Cell Analysis



A COMPLETE SOLUTION

for Mammalian Cell Culture Applications

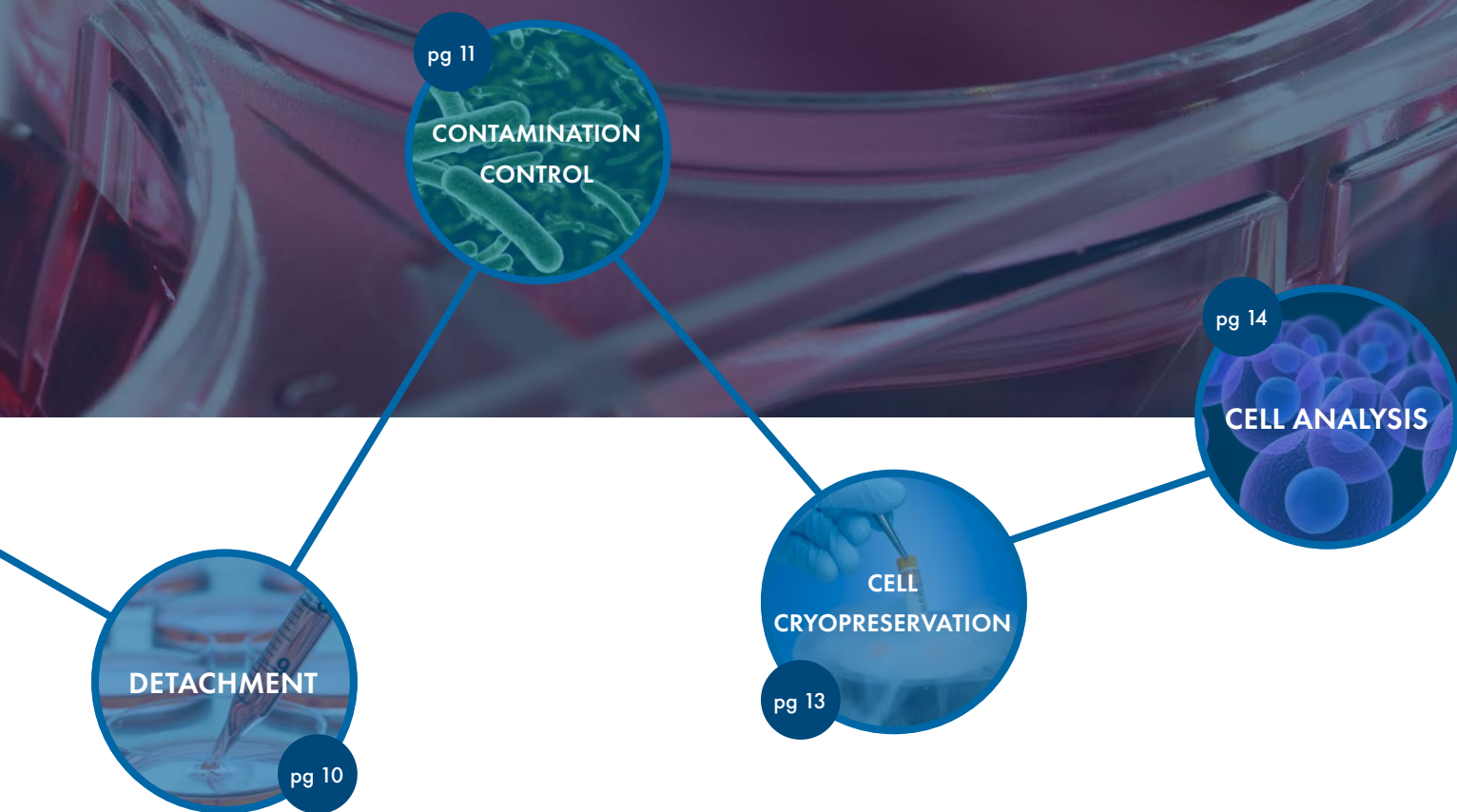
High Performance Products for Mammalian Cell Culture



The culturing of mammalian cells and tissues is an important and well-established technique used in both academic and industrial laboratories. It involves a complex set of processes by which cells are removed from their natural living environment and then maintained or grown under well-controlled, artificial conditions. This controlled environment generally consists of a liquid mixture in an isolated container that provides a variety of components (Table 1) necessary for the cells to survive and proliferate.

Cell Culture Components	Functions in Mammalian Cell Culture
Amino acids	Structural components of proteins and peptides
Carbohydrates	Source of energy
Lipids	Energy stores, cellular structural components
Vitamins	Cell survival and growth
Minerals	Maintenance of enzyme functionality
Growth factors	Cellular growth and differentiation
Hormones	Cellular growth and differentiation
Balanced salt solution	Balance of pH and optimum osmotic pressure

Table 1. Cell culture components and their functions in mammalian cell culture



Mammalian cell culture is a fundamental tool for life science research and biological industry, as it provides a model system of selected cells for studying a diverse range of physiology and biochemistry applications. These applications range from basic research to pharmaceutical manufacturing, drug screening to clinical treatment, and from vaccine development to personal treatment. For all purposes, it is essential to obtain consistent and reproducible cell culture results. The overall quality of cell culture media and its supplements plays a critical role in the success of cell culture.

For over 50 years, MP Biomedicals has been supplying workflow-based mammalian cell culture products, including sera, attachment factors, basal media (balanced salt solutions, minerals, amino acids, vitamins, etc.), cell detachment solutions, and antibiotics for use in mammalian cell culture media. These components are readily available from MP Bio in the quality and quantities desired to support media formulation. We can provide ready-to-use liquid or easy-to-make powders for your mammalian cell culture. Whether you are growing adherent cells, suspension cells or require media with or without fetal bovine serum (FBS), MP Bio's time-tested components will ensure your cell culture performs optimally and reliably.

High Performance Sera for Optimal Cell Culture

Animal sera, whether from bovine, human or other animal source, provide all essential nutrients such as proteins, attachment factors, growth factors, amino acids, trace elements, vitamins, lipids, and hormones for healthy mammalian cell growth. Additionally, animal serum plays an essential role in regulating cell osmotic pressure and membrane permeability, serving as a carrier for enzymes, micronutrients, lipids, and trace elements into the cell. Therefore, animal serum has been widely used as a nutrient boost for most cell culture applications in the life sciences. However, if the serum is not obtained from a reliable source, contamination can pose a serious threat to successful cell culture. The varied nature of animal products is also a concern, which introduces challenges with variability, standardization, country of origin, and specifications.

To meet and exceed quality control standards for high performance in cell culture, all sera at MP Bio are tested by independent third-party laboratories for the presence of endotoxins, mycoplasma, bacteria, fungi, and viruses; for total protein concentration (including hemoglobin content); and for the growth of cells. A certificate of analysis for each lot is available upon request.

Fetal Bovine Serum

Fetal bovine serum (FBS) is one of the most widely used serum-supplements for in vitro cell culture. FBS contains a complex array of protein components, excellent cell growth factors, low endotoxin levels, and low hemoglobin concentrations, all of which are required by many cells to survive, grow and divide. FBS from MP Bio offers excellent value for general cell culture, specialty research and bioprocessing. With our quality assurance system from raw materials to final product, we ensure reliable and consistent delivery of high quality FBS to our customers.

- ✓ Tested on cell growth performance
- ✓ Low endotoxin levels
- ✓ Free of mycoplasma contamination
- ✓ Specific virus testing (BVD, IBR, PI3)
- ✓ Sterilization by triple 0.1-micron filtration
- ✓ Country of origin and traceability



Sera from other animals

Although fetal bovine serum is the most commonly used sera for mammalian cell culture, many other animal sera are also used based on cell origin, cross-reactivity, performance requirements and costs. MP Bio offers a wide spectrum of animal sera from human, newborn calf, horse, goat, rabbit, porcine and chicken for both research and bioprocessing applications.

Product	Cat. No.
Fetal Bovine Serum (FBS)	
CELLect™ FBS, GOLD, Heat Inactivated, US Origin	0929168
CELLect™ FBS, GOLD, US Origin	0929167
Cellmaxx™ Fetal Bovine Serum, New Zealand Origin	0929176
Fetal Bovine Serum, South America Origin	0929101

Product	Cat. No.
Sera from other animals	
Human Serum	0929301
Human Type AB Serum from Male Donors	0929309
Human Serum, Pooled	0929311
Rabbit Serum	0929411
Chicken Serum	0929501
Newborn Bovine Serum	0929121
Donor Horse Serum	0929211



Serum Replacement for Long-Term Mammalian Cell Culturing



FastGro™, Fully Chemically Defined FBS Replacement

Fetal bovine serum (FBS) is widely used as a serum-supplement for in vitro cell culture media. FBS promotes healthy cell growth by providing an undefined mixture of nutrients, such as proteins, attachment factors, growth factors, lipids and hormones. However, due to its undefined nature, FBS can lead to unexpected and undesired stimulation of cells. There is also biorisk from animal protein or pathogen contamination, including risk of bovine spongiform encephalopathy (BSE).

To avoid these concerns, MP Bio has launched FastGro™, a fully chemically defined FBS replacement for cell culture use. It allows culturing a wide range of cells in vitro without the use of serum or any animal or human derived compound.

Product	Cat. No.
FastGro™, Fully Chemically Defined FBS Replacement	0926400

- ✓ Chemically defined nature without lot-to-lot variations
- ✓ No animal or human derived materials or compounds
- ✓ No interference with hormones or growth factors
- ✓ Elimination of the risk of contaminants – viruses, mycoplasma, prions, etc.
- ✓ Wide range of cell culture practices
- ✓ Storage in the refrigerator – no need for thawing before use

TCM™ and TCH™

Low-serum and serum-free media provide important advantages in animal cell culture, as the chemically controlled environment offers improved reproducibility and safety by removing lot-to-lot variation and biorisk inherent to animal serum. TCM and TCH are designed to eliminate the use of serum in cell culture, providing all essential components to promote cell growth and viability in most cell culture situations.

TCM is a fortified, multipurpose serum replacement for long-term culturing of many types of anchorage dependent and suspension cultures with a variety of species, especially primary cell cultures. TCH is particularly developed for long-term culturing of human cells.

Product	Cat. No.
TCM™ defined serum replacement, 50x concentrate	0920100
TCH™ defined serum replacement, 50x concentrate	0920200

- ✓ Chemically defined nature
- ✓ Free of biological variability
- ✓ Free of growth factors or steroid hormones
- ✓ Long-term culture with no chromosomal or morphological alterations
- ✓ Versatile to any basic cell culture media
- ✓ Low endotoxin levels
- ✓ Low protein content: simplify downstream processing and purification processes

Attachment Factors for Successful Mammalian Cell Culture



Most mammalian cells derived from solid tissues are adherent cells, which require a surface coated with extracellular matrix (such as structural proteins or protein-like substances) components to increase adhesion properties and provide other signals for growth and differentiation. While some mammalian cells can synthesize these components, most cells require an exogenous source, particularly when grown in serum-free culture. To facilitate cell adhesion, migration, growth, morphology, and differentiation, we offer a selection of attachment and matrix factors, such as collagen type I, fibronectin and laminin.

Product	Cat. No.
Collagen Type I from calf skin	02150026
Collagen solution, 0.3%, 20 mL	02193492
Fibronectin, human, >95%	02151126
Fibronectin, human, purified	0855913
Laminin	02150027
Poly-L-lysine hydrochloride	02152690
Poly-L-Lysine hydrobromide	02152689
Poly-D-Lysine hydrobromide, MW 70,000-150,000	02150175
Poly-D-Lysine hydrobromide, MW 4,000-15,000	02102694

Chemically Defined Basal Media for Consistent Results

Successful growth of mammalian cells requires high quality and reliable basal media, which contain amino acids, vitamins, inorganic salts, and a carbon source, such as glucose. MP Bio offers a complete range of products designed to support optimal cell growth, ensuring reproducible and consistent results.

Chemically defined powder and liquid media are manufactured with minimal risk of contamination in an environmentally controlled facility. Chemicals used in production meet the highest quality and purity standards. The result is high cell yield and a homogeneous cell population for research and manufacturing applications.

- ✓ Chemically defined essential components
- ✓ Lot-to-lot consistency
- ✓ Extremely low endotoxin levels
- ✓ Free of mycoplasma contamination
- ✓ Animal-component free
- ✓ Liquid and powder formats

Product	Cat. No.
DMEM (1X), without L-glutamine	0912332
DMEM (1X), with 4.5 g/L dextrose, with L-glutamine	0912333
DMEM (1X), with 4.5 g/L dextrose, without L-glutamine and L-leucine and sodium pyruvate	0916421
DMEM (1X), with 4.5 g/L glucose, without L-glutamine and inositol	0916429
DMEM (1X) with 20 mM HEPES, without L-glutamine or sodium bicarbonate	0912334
DMEM, with L-glutamine, with 4.5 g/L glucose, without sodium bicarbonate, powder	0910331
MEM (1X), without L-glutamine	0912102
MEM (1X), Earle's Salts and 2.0 g/L sodium bicarbonate, without L-glutamine, L-cysteine, L-cystine, and L-methionine	0916414
MEM, Amino Acids (50X) solution	0916011
MEM, Earle's Salts and L-glutamine, without sodium bicarbonate, powder	0910101
Basal Medium Eagle Vitamin Concentrate (100X)	0916004
RPMI (1X), without L-glutamine, L-cysteine, L-cystine, and L-methionine	0916464
RPMI 1640 with 2 g/L sodium bicarbonate, without L-glutamine and glucose, powder	0916468
RPMI 1640 (1X), without glutamine	0912602
RPMI 1640 (1X), with L-glutamine and sodium bicarbonate	0912603
Ham's F-10 (10X), without L-glutamine and sodium bicarbonate, with 12.4 mg/L phenol red	0914400
Ham's F-10, with L-glutamine, without sodium bicarbonate, powder	0910401
Ham's F-12 (modified) with L-glutamine, without sodium bicarbonate, powder	0910421
Ham's F12 (1X), with L-glutamine	0912423
Phosphate Buffered Saline (PBS), tablets	0928103
Dulbecco's Phosphate Buffered Saline (10X), without calcium and magnesium	0919604
Dulbecco's Phosphate Buffered Saline (1X), without calcium and magnesium	0918604
McCoy 5A Medium (1X), Iwakata & Grace Modification with L-Glutamine	0912553
McCoy 5A Medium (1X), Park and Terasaki's Modification without L-glutamine and sodium bicarbonate	0916921

Animal Extract Products for Mammalian Cell Culture

Bovine Extract for Maximum Mitogenicity

Containing a full spectrum of putative mitogens and growth factors, bovine pituitary extract (BPE) and bovine brain extract (BBE) continue to be the most successful tissue-sourced extracts for culturing a wide range of cells in vitro, particularly epithelial origin and stem cells. To maintain the full spectrum of biological activities and minimize biorisk of animal origin products, MP Bio recently launched BPE and BBE derived from young, healthy New Zealand cattle from USDA approved sources.

Bovine Pituitary Extract (BPE):

- Promotes maximum cell mitogenicity
- Allows serum-free culturing of primary epithelial cell types without fibroblast contamination
- Promotes differentiation of pluripotent stem cells
- Sterile filtration from non-lyophilized tissue
- Maintains consistent activity in serum-free culture systems
- Low TGF- β levels to minimize any premature senescence
- Cost-effective: a third of the cost of serum

Bovine Brain Extract (BBE):

- Promotes maximum cell mitogenicity
- Promotes differentiation of pluripotent stem cells
- Supports growth and extended passaging of primary neuronal cell types
- Sterile filtration from non-lyophilized tissue
- Cost-effective alternative to endothelial cell growth supplement

Product	Cat. No.
Bovine Pituitary Extract	0928504
Bovine Brain Extract	0928505

Chicken Embryo Extract

Chicken Embryo Extract (CEE) is an undefined medium component prepared from chicken embryos. While the exact mechanism the supplement exerts on cell growth has not been fully elucidated, various studies note that CEE has a positive effect on growth and attachment. MP Bio offers high quality CEE, ensuring:

- Healthy cell growth for avian neural crest cells, muscle cells, myoblast cells, dorsal root ganglion neurons, etc.
- Sterilization by 0.2 μ m filtration
- Preparation from 9 to 12-day old chicken embryos for maximum performance
- Free of any clinical signs of disease

Product	Cat. No.
Chicken Embryo Extract	0928501



Bovine Serum Albumin (BSA) from New Zealand for Optimal Cell Growth

One primary function of BSA as an additive is to bind, protect and stabilize a range of important small molecules and ions in the cell culture media, particularly for serum-free media. BSA binds fatty acids and protects them from oxidation; interacts with metal ions such as copper and keeps them from participating in oxidation reactions; binds cysteine and glutathione and protects them from oxidation; binds bilirubin and pyridoxal-5'-phosphate and protects them from oxidation. Thus, the purity and activity of BSA are extremely important for successful cell culture. To maximize its performance in cell culture, BSA from MP Bio – New Zealand (AlbumiNZ™) has been purified by chromatography to ensure the highest purity. Unlike with other extraction procedures (e.g. Cohn, Heat Shock), our bovine serum albumin is more biologically intact and highly retains cell growth stimulating activity.

While bovine serum albumin has been routinely used in mammalian cell culture for many years, concern has recently increased pertaining to the risk of viral and microbial contamination. New Zealand's Ministry of Agriculture and Forestry (MAF) has developed a rigorous system of controls to minimize those risks and certify that imported and exported products are disease-free. MP Bio – New Zealand sources and purifies bovine proteins completely within this system, yielding products with the best risk mitigation. Our facility is certified by MAF, documenting the efficacy of the procedures to maintain our disease-free status.

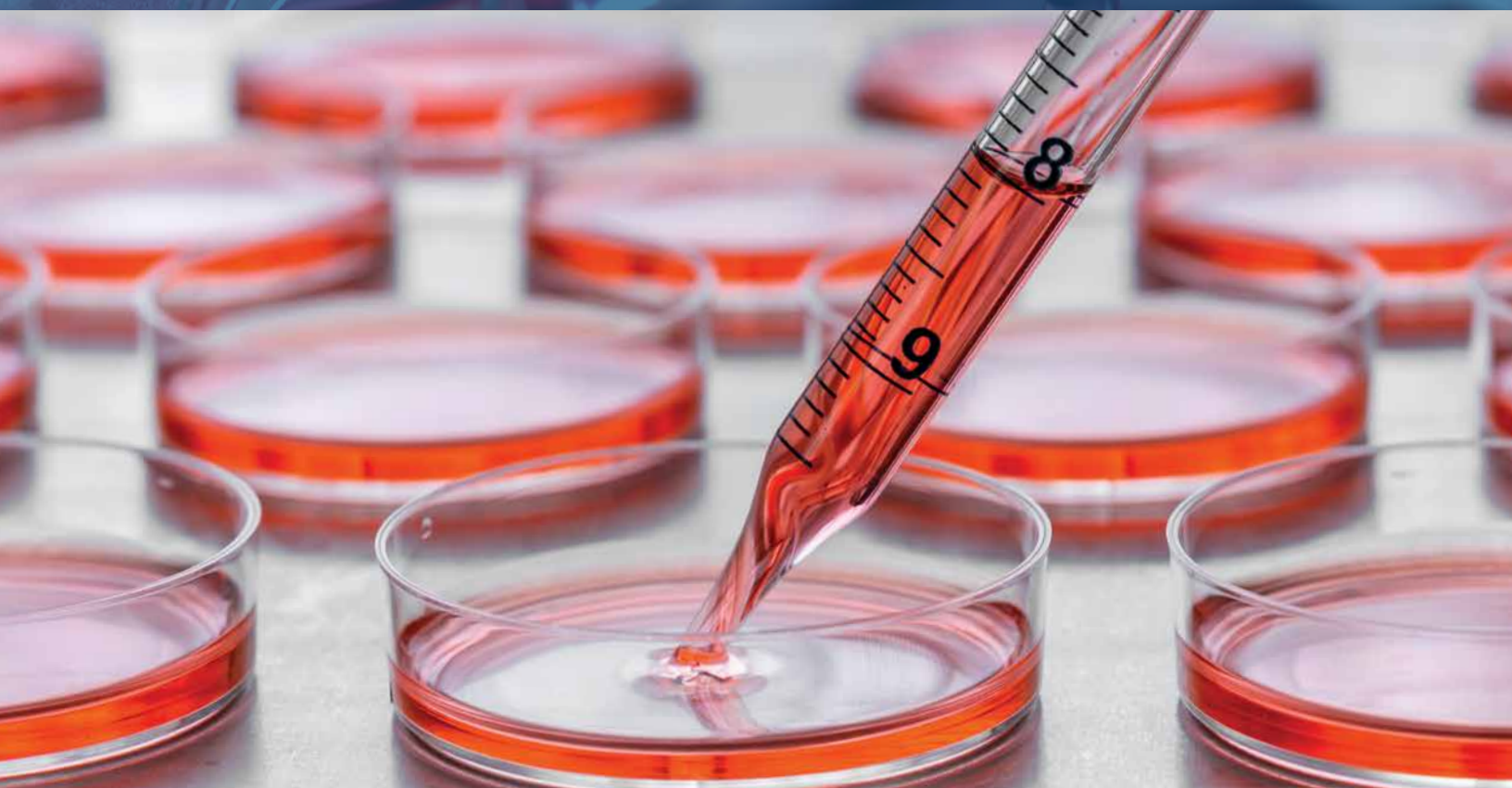
- ✓ New Zealand sourced raw materials having negligible BSE risk
- ✓ Free of BSE and List A animal diseases
- ✓ Virus testing according to 9 CFR
- ✓ Superior performance over Cohn's Albumin Fraction V
- ✓ Intact proteins with high activity
- ✓ Highest purity and consistency

Product	Cat. No.
AlbumiNZ™ Low Fatty Acid BSA	02199899
AlbumiNZ™ Low Endotoxin BSA	02199896
AlbumiNZ™ Protease-reduced BSA	02199898
AlbumiNZ™ Microbiological Grade BSA	02180620

In addition to AlbumiNZ BSA from New Zealand, we offer BSA from US origin with high performance in cell culture.

Product	Cat. No.
Bovine Albumin Fraction V, ≥ 98%	0881001
Bovine Albumin Fraction V, Protease Free, ≥ 99%	0882045
Bovine Albumin Fraction V, Low Endotoxin, >98%	0881068
Bovine Albumin Fraction V, Reagent Grade	0881066
Albumin, Bovine, Microbiological Grade	0884005

Cell Detachment



For adherent mammalian cell cultures, cells first need to be detached before further study. This detachment process is commonly performed with a mixture of trypsin-EDTA. In some instances, trypsin reduces cell viability due to damage to the membrane and extracellular matrix. As a superior alternative to trypsin, we recommend Accutase®, a blend of proteolytic and collagenolytic enzymes ideal for gentle cell detachment.

Gentle and efficient
for cell detachment

**Maximum
cell viability**
compared to trypsin

Proven effective
over a wide range of
primary cells

Versatile on various
cell culture surfaces

Product	Cat. No.
Accutase® Cell Detachment Solution	0910004
50X Trypsin-EDTA solution	0916896

Detect and Eliminate Mycoplasma Contamination

One of the major issues in dealing with mammalian cell culture is infection due to mycoplasma. Mycoplasma are simple bacteria lacking cell walls and are considered the smallest self-replicating organism (typically less than 150 nanometer). However, these simple bacteria can infect the culture and alter a variety of cellular characteristics and functionalities (metabolism, morphology, proliferation etc.), often leading to experimental artifacts and cell loss. Therefore, it is essential to detect the presence of mycoplasma in your cell cultures and remove them effectively without compromising cell viability.

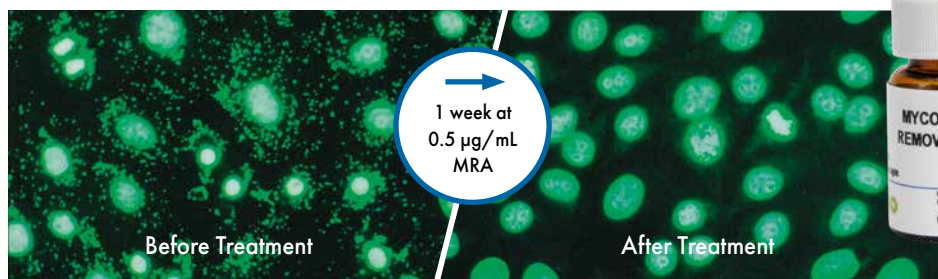
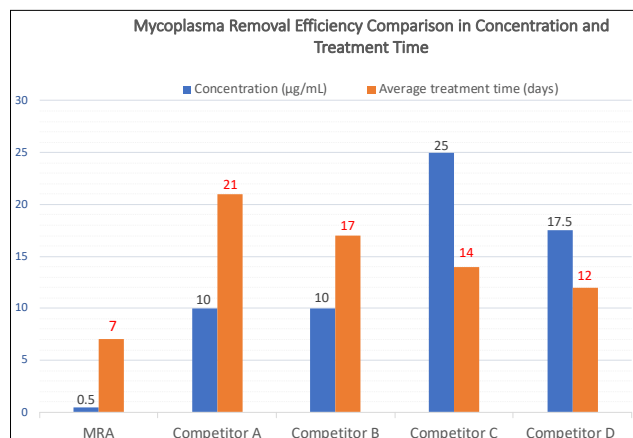
To sensitively detect the presence of mycoplasma in your cell culture, MP Bio offers Myco-Sniff Mycoplasma PCR Detection Kit. The kit provides fast, reliable, and sensitive mycoplasma detection with a detection limit as low as 20 CFU/mL. For product release testing and in-process control during manufacturing, we also offer Myco-Sniff-Valid Mycoplasma PCR Detection Kit with an increased detection sensitivity as low as 10 CFU/mL.

Myco-Sniff Mycoplasma PCR Detection Kit Benefits

- ✓ High sensitivity
- ✓ Wide detection range of mycoplasma species
- ✓ Premixed components for ease-of-use
- ✓ High specificity, with no interference of animal or bacterial DNA
- ✓ Fast detection speed - as little as 3 hours
- ✓ Elimination of cross-contamination with inclusion of 8-MOP

Once mycoplasma is detected in the cell culture medium, it is essential to eliminate mycoplasma without losing any cells or causing further contamination. Mycoplasma Removal Agent (MRA) is a reliable solution for mycoplasma removal and prevention.

- Eliminate mycoplasma species within one week
- Treat mycoplasma effectively at 0.5 µg/mL, the lowest dosage in the market
- Prevent recontamination of the culture at 0.1 µg/mL
- Compatible with most mammalian cell lines
- Citation and recognition in 550+ scientific publications



Product	Cat. No.
Myco-Sniff™ Mycoplasma PCR Detection Kit	0930502
Myco-Sniff-Valid™ Mycoplasma PCR Detection Kit	0930503
Mycoplasma Removal Agent (MRA)	0930500

Cell Culture Antibiotics

Keep your cell cultures contamination free

Cell culture media can be easily contaminated by microbiological organisms such as bacteria, yeast, fungi and mycoplasma, causing serious cell malfunction or death. While it is impossible to eliminate entirely microbiological contamination, it is often practical or necessary to reduce its frequency and seriousness by using antibiotics without altering cellular growth parameters.

High quality antibiotics from MP Bio can eliminate cell culture contamination with minimal impact on the cells. These easy-to-use antibiotics can efficiently keep cell cultures contamination-free from a wide range of microbiological contaminants.

Product	Cat. No.
Amphotericin B, 250 µg/mL (Fungizone)	0916723
Gentamicin Sulfate Solution, 10 mg/mL	0916760
Gentamicin Reagent Solution, 50 mg/mL	0916762
G418 Sulfate, 50 mg/mL (Geneticin)	0916725
Kanamycin Sulfate, 5 mg/mL	0916720
Penicillin-Streptomycin (10,000 IU/mL, 10 mg/mL)	0916702
Penicillin-Streptomycin-Amphotericin B (100X)	0916740

CLEAN ANYTHING

with 7X – A Proven Labware and Industry Equipment Cleaning Solution!



- Effective cleaning solution with no etch to glass or plastic labware at any concentration
- Eliminates interfering residues for flow cytometry and other instrumentation
- Nontoxic for tissue and cell culture
- No need for pH adjustment at any concentration
- Easy to store – 1 gallon of 7X concentrate can make up to 100 gallons of cleaning solution

Product	Cat. No.
7X Cleaning Solution	0976670
7X Cleaning Solution, Ready-to Use	0976680
ES-7X cleaning solution, Phosphate Free	0976671
ES 7X cleaning solution, Ready-to-Use	0976681
7X-O-Matic Cleaning Solution, Machine Wash	0976674
7X-O-Matic Cleaning Solution, Ready-to-Use	0976684
ES 7X-O-Matic, Phosphate Free, Machine Wash	0976671

A Complete Solution for Cryopreservation

With over 40 years of experience manufacturing and supplying cell biology products, MP Bio understands the challenges associated with cell cryopreservation. Cryopreservation media from MP Bio ensures:

- Consistent high cell viability
- Serum-free and protein-free formulation
- Validation with multiple cell types
- Long-term cell storage
- Balanced components for maintaining cellular functions
- Long shelf life



We proudly offer a complete solution for cryopreservation to meet your needs:

**Cryopres™ Dimethyl Sulfoxide
(> 99.9% USP DMSO)**

Commonly used in cell cryopreservation, along with glycerol, to prevent damage to the cell membrane during freezing.

pZerve™

Ready-to-use, sterile, cryopreservation solution lacking dimethyl sulfoxide (DMSO), fetal bovine serum or other animal protein.

**Cell Cryopreservation Medium
with 10% DMSO**

A balanced, protein free, ready-to-use cryopreservation solution with 10% USP DMSO (Cryopres™).

2-8 CELLsium™

Cytoprotective, protein free, ready-to-use biosolution lacking Dimethyl Sulfoxide (DMSO) for the short-term storage of cells or tissue

Product	Cat. No.
pZerve Cryopreservation Solution	0920303
Cell Cryopreservation Medium with 10% DMSO	0927802
Cryopres™ Dimethyl Sulfoxide (>99.9% USP DMSO)	0927801
2-8 CELLsium™ medium for short-term cell storage	0927803

High Performance Cellular Analysis Kits

Built upon our diverse scientific expertise, time-tested products and technology platforms, MP Bio recently introduced new cellular analysis kits at the whole cell level, thereby providing research tools to monitor cell viability, proliferation, mitophagy and cellular senescence.



FastCounting™ Cell Counting Kits

Provides a sensitive and convenient method to determine cell viability in cell proliferation and cytotoxicity assays

Highest sensitivity dye for cell viability

Lowest cytotoxicity among all tetrazolium reagents

Simple procedures without the need to thaw reagents



FastMitophagy™ Detection Kit

Designed for mitophagy detection in mammalian cells

Simple procedure: just add the Mitophagy dye - no need for transfection

More sensitive than other autophagy markers



FastCellular™ Senescence Detection Kit

Detects senescent cells with significantly higher sensitivity than X-gal

Higher sensitivity due to a new fluorogenic detection probe

Applicable for living cells and fixed tissues

Product	Cat. No.
FastCounting™ Cell Counting Kit	0926901
FastMitophagy™ Detection Kit	0926902
FastCellular™ Senescence Detection Kit – SPiDER-Beta-Gal	0926903

One Call. One Source. A World of Life Science Reagents.

In addition to our extensive portfolio of cell culture products, MP Bio also offers a complete collection of general and niche life science products. Drawing on years of manufacturing and laboratory experience, our diverse array of products cover the areas of molecular biology, biochemistry, immunology, cell biology, fine chemicals and diagnostics. Our comprehensive workflow solutions are suitable for a variety of research applications and we remain a leader in sample preparation.

MP Bio is dedicated in providing the best possible reagents, kits and services so researchers and scientists can achieve the same results, every time. We support our customers through exceptional customer service and technical support and afford scientists with a wealth of products, tools, and resources. As your partner in research, MP Bio is a one stop destination for quality products, reliable services, and innovative solutions.

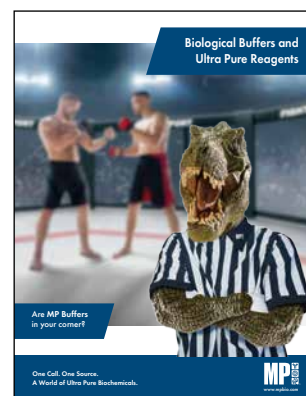
Visit our website at www.mpbio.com to learn more about our products and to open an account. View and download our collection of application notes, brochures, case studies and protocols to help advance your research at mpbio.com/support.



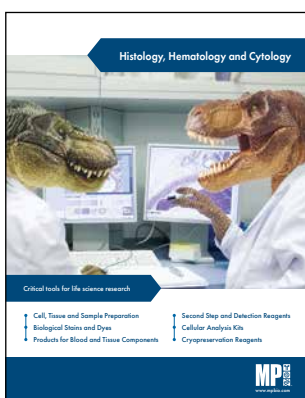
Immunology and
Cell Biology



Kits and Reagents for
Animal Research



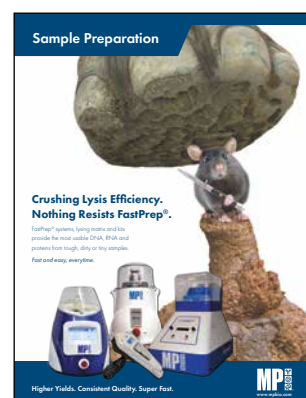
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Ultra Pure Reagents



Histology, Hematology
and Cytology



Antibiotics for
Cell Culture



Sample
Preparation

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UK: 0800.282.474 | custserv.uk@mpbio.com

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- Culture Growth Media
- FastPrep® Sample Prep
- Immunology
- Molecular Biology
- Adsorbents
- Biochemicals
- Fine Chemicals
- Labware
- Dosimetry
- Research Diets
- SafTest™ Food Quality
- Diagnostics
- Drugs of Abuse
- Infectious Disease
- EIA/RIA

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