



Product Profile

Product Name:	Minimum Essential Medium-Alpha(MEM- α) With 4.5g/l D- Glucose(High Glucose), with L-Glutamine, without Ribonucleosides and Deoxyribonucleosides
Product Catalog Number	01-043-1
Concentration:	1X
Unit Size Availability:	(A)500ml (B)100ml
Formulation:	Clear Red-Colored Solution
Optimal Storage Conditions:	2-8°C
Stability: (Under Specified Handling & Storage Conditions)	Please Refer To Product Label

Important Note! Please read the MSDS and Product Profile carefully in their entirety before using this material for possible safety precautions and potential hazards.

Product Description:

Minimum Essential Medium (MEM) is one of the most widely used of all synthetic cell culture media originally developed by Harry Eagle. During early attempts to cultivate normal Mammalian Fibroblasts and certain subtypes of HeLa(i.e. Immortal Cell Line of Cervical Cancer Cells) cells revealed that they had unique niche nutritional requirements that could not be accommodated by Eagle's Basal Medium (BME). Subsequently, studies utilizing these and other cells in culture were indicative that additions or supplements could be made to the original BME medium and optimized or uniquely designed to promote continuous growth of a wider array of more intricate and complex cells and cell lines. MEM - α modification incorporates these essential add-ons including higher concentrations of Amino Acids (AA's) and other constituents to significantly broaden its applicability. MEM Alpha comes highly recommended for a wide array of cell culture applications. MEM has typically been utilized for the cultivation of cells grown in monolayers (i.e. most cell cultures grow as a single thickness cell layer or sheet attached to a substrate) for a wide variety of normal and transformed cell lines as these new modifications have expanded its utility.

Cultured cells require a sterile environment and an optimal nutrient supply for growth and viability. Over the years variously defined media have been designed, developed, modified and enriched with a wide spectrum of constituents for supporting a vast range of cell types. Precise media formulations have been specifically developed by optimizing the concentrations of each and every component which performs a uniquely defined function.

This type of cell culture medium consist of higher concentrations of Amino Acids (AA's), Energy Sources, Inorganic Salts, and Vitamins among other nutrients. The modification, development and variation of this MEM formulation is a necessary prerequisite for the attachment, spreading and growth of certain cells *in vitro*. To maximize success, the *in vitro* culture conditions are designed to mimic such crucial *in vivo* conditions of nutrition, osmolality, pH and temperature. Optimal and critical nutrient components including such Inorganic Salts (e.g. NaCl, KCl, CaCl₂), Amino Acids (e.g. Arginine, Histidine, Lysine), energy sources (e.g. Glucose, Glutamine, Pyruvate), and Vitamins (e.g. Nicotinamide, Thiamine, Riboflavin) are part and parcel that culminate in a perfect milieu for growth and viability. Whereas Amino Acids are incorporated into proteins and at a minimum these media must contain the essential Amino Acids, Vitamins are not only needed for cell growth and multiplication but also are important for cell survival and growth rate.

Unlike the balanced salt solutions that form the basis of many complex media formulations and are utilized to maintain cells for the short term in a viable condition, MEM- α may be modified and further enriched to promote the growth and viability of other cells in culture. MEM- α may be utilized for a broad and variegated spectrum of cell lines when properly supplemented.

These variegated components that constitute M- α have been developed in order to fulfill the basic cell requirements for some of the basic and essential ions including: calcium, phosphate, potassium and sodium and therefore contain various amounts of CaCl₂, KCl, NaCl, and others. The key constituents of salts are the ions which function in osmolality whereas others such as Calcium and Magnesium are known, among other functions, to serve as cofactors for and support cell attachment and aggregation. Glucose and L-Glutamine serve as a major carbon and energy source and Phenol Red may serve as a pH indicator in specific cell culture media. MEM- α also contains Sodium Bicarbonate which has an intimate relationship with and plays a major role with CO₂ by helping to maintain optimal physiological pH.

Naturally occurring and chemically modified ribonucleosides have interesting bioactive effects. Where dietary ribonucleosides are ingested mainly as nucleoproteins with the ability not only to enhance gut growth and maturation, but also increase iron absorption. Cytochemical studies showed that several ribonucleosides with human cells may induce apoptosis and therefore may be utilized as potential anti-cancerogenic compounds. Modified ribonucleosides serve as valuable pathobiochemical marker molecules for cancer and chemically modified ribonucleosides have already found applicability serving as pharmaceutically active compounds in the treatment of different diseases including AIDS. Some of these findings demonstrate the potential applications of ribonucleosides such as in functional foods as well as pharmaceutical preparations. Nucleosides like pyruvate and lipids are often added in more complex media formulations when the serum level may be reduced or can help during cloning and support of certain specialized cell types.

Some Predominant Characteristics of *MEM –Alpha* include:

- ◆ Liquid Formulation, High Glucose(4.5g/l)
- ◆ With L-Glutamine
- ◆ With Sodium Bicarbonate(NaHCO₃)
- ◆ With Phenol Red(C₁₉H₁₃NaO₅S) as pH indicator
- ◆ Without Ribonucleosides and Deoxyribonucleosides
- ◆ Sterile-Filtered(0.1μ)
- ◆ Cell Culture-Tested

Storage & Handling

The product should be stored at 2-8°C. The medium should be warmed to room temperature prior to use. The product should not be left in the light for prolonged periods as it is light-sensitive. When stored in the dark under ideal conditions, the product is stable until the expiry date.

Instructions /Procedure:

- 1) Take a bottle from the proper storage conditions at 2-8°C and read the label.
- 2) Ensure that the cap of the bottle is tight.
- 3) Gently swirl the solution in the bottle.
- 4) Wipe the outside of the bottle with a disinfectant solution such as 70% ethanol.
- 5) Using aseptic/sterile technique under a laminar-flow culture hood, work according to established protocols.

Quality Control

Test	Specification
Appearance:	Clear Solution
Cell Culture Test:	Pass Test
Endotoxins:	Test & Record
Osmolality:	294-330 mOsm/Kg
pH:	7.1-7.5
Sterility:	Sterile

Auxiliary Products:

Product Name	Catalog Number	Storage Temperature
Basal Medium Eagle (BME), Earle's Salts Base, without L-Glutamine, without Sodium Bicarbonate 10X	01-015-5	2-8°C
Minimum Essential Medium Eagle (MEM-E), Earle's Salts Base, without L-Glutamine	01-025-1	2-8°C
Minimum Essential Medium Eagle(MEM-NEAA), Earle's Salts Base, with Non-Essential Amino Acids, without L-Glutamine	01-040-1	2-8°C
Minimum Essential Medium Eagle(MEM) for Suspension Cultures, without L-Glutamine	01-045-1	2-8°C
Medium-M-199(Earle's), Earle's Salts Base, with L-Glutamine	01-080-1	2-8°C
Medium-M-199 10X Conc.,(Earle's), Earle's Salts Base, with L-Glutamine, without Sodium Bicarbonate	01-080-5	2-8°C
Ribonucleosides and Deoxyribonucleosides for MEM-Alpha, 500X Conc.,	01-343-1	-20°C
Earle's Balance Salt Solution 10X Conc., without Sodium Bicarbonate	02-010-5	Room Temperature (15-30°)
Earle's Balance Salt Solution without Phenol Red	02-011-1	Room Temperature (15-30°)
Earle's Balance Salt Solution without Phenol Red, without Sodium Bicarbonate	02-011-5	Room Temperature (15-30°)
L-Glutamine Solution 29.2mg/ml in Saline	03-020-1	-20°C
L-Alanyl-L-Glutamine Solution(A Dipeptide Substitute)	03-022-1	-20°C
Penicillin-Streptomycin Solution,10,000 units/ml Penicillin G Sodium Salt,10mg/ml Streptomycin	03-031-1	-20°C
Sterile Culture-Grade Water	03-055-1	Room Temperature (15-30°)
Serum-Free Cell Freezing Medium	05-065-1	2-8°C
Note: For a list of other Antibiotics, Serum, Reagents and Supplements, please refer to our Product Catalog/Product Profiles, Product Guides and Internet Site.		

References:

- 1) Current Edition Merck Index
- 2) Biological Industries(BI) Specifications
- 3) Darling, D.C. and Morgan, S.J. Animal Cells: Culture and Media. New York: John Wiley & Sons,1994