Product Profile

Product Name:	*Ribonucleosides and Deoxyribonucleosides For MEM-Alpha,500X Conc.*
Product Catalog Number	*01-343-1*
Unit Size Availability:	(D)10ml
Concentration:	500X
Formulation:	Clear Solution
Specified Storage Conditions:	(-20°C)
Stability: (Under Ideal Handling Storage)	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:

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.

Nucleoside uptake in Mammals may be divided into two categories on the basis of the underlying transport mechanism. In order to exert many of their physiological and cytotoxic effects, Nucleosides and their analogs must first cross the plasma membrane. In facilitated diffusion (a.k.a. equilibrative transport), the flux of the Nucleoside (NS) across the membrane is driven solely and uniquely by the concentration gradient, whereas in active transport, the flux is paired to sodium ions such that the electrochemical ion gradient can drive cellular uptake of NS against their concentration gradients. The concentration range and selective uptake of the different Nucleosides by the cells will, in all likelihood, be based empirically as the concentration range will logically be selected to match the NS concentrations in some biological fluids (e.g. plasma, milk).Under certain circumstances, some mixtures of Nucleosides/Nucleotides (NS/NT) may cause a marked inhibition of DNA synthesis with a concomitant reduction in cell viability. In contrast, just the right concentration and mixture, the NS/NT stimulatory effect on *in vitro* modulation and cell proliferation suggests that the response to Nucleosides may be stimulatory or inhibitory depending upon three major factors:

- the state of Cell Differentiation
- the phase of the Cell Cycle
- the time of Incubation

Adding just the appropriate mixture and concentration of Nucleosides to medium will facilitate their selective uptake which will activate receptors and trigger signal transduction pathways by modulating and enhancing cell proliferation and function.

If Ribonucleosides are purine or pyrimidine bases linked glycosidically to ribose, then Deoxyribonucleosides are purine or pyrimidine bases linked N-gycosidically to 2-deoxy-D-ribofuranose. Both are lacking the phosphate residues that would make it a nucleotide. Nucleosides are derived from the bases by the addition of a sugar. The Ribonucleosides are adenosine, guanosine, cytidine and uridine where Deoxyribosides are deoxyadenosine, deoxyguanosine, deoxycytidine and deoxythymidine, the latter almost universally referred to as thymidine. Nucleotides are phosphate esters of nucleosides, which are themselves conjugates between the biological bases and sugars, either ribose or 2-deoxyribose and deoxyribonucleosides. Whereas Ribonucleotides are not only precursors of RNA but are also common metabolic intermediates and regulators (e.g.,AMP,ADP,ATP), Deoxyribonucleotides, required for DNA synthesis, are made by the biological reduction of the corresponding dinucleotides and the deoxyribnucleotides which are phosphorylated to give triphosphonucleotides. Nucleotides occur as part of other biological molecules (e.g., NAD) which is the ADP-ribose derivative of nicotinamide. Nucleotide adducts are important intermediates in anabolic processes. CDP derivatives occur on lipid biosynthesis and UDP and TDP derivatives are important in sugar metabolism.

Macromolecules are large complex biological molecules traditionally grouped into four major categories: Carbohydrates, Lipids, Nucleic Acids and Proteins. Of interest are the Nucleic Acids that are long polymers of repeating subunits known as nucleotides. From the simplest cell and the information encoded in it is a long, cable-like molecule known as deoxyribonucleic acid (DNA). Each DNA molecule is formed from two long chains of building blocks called nucleotides that are wound around each other. Facing each other, these two chains contain information as a sequence of letters and the sequence in which this information is encoded occurs as four different nucleotides in DNA. These specific sequences of several hundred to many thousands of nucleotides make up a gene. A gene, as a unit of information, might encode a specific molecule known as RNA or a gene might act to regulate other genes.

As the selection of a nutrient medium or supplementation thereof is strongly influenced, among others, by many factors, of note are three major considerations:

- ◊ Cell Type
- ◊ Type of Culture(e.g., Clonal, Monolayer, Suspension)
- ◊ Degree of Chemical Definition

It is recommended to review the extensive literature concerning cell-culture media and its supplementation and the physiological parameters required for each specific cell-line as per their essential niche requirements.

Predominant Characteristics o f Ribonucleosides and Deoxyribonucleosides for MEM-Alpha, 500X Conc.., includes:

- § Liquid 500X Concentrate
- § Stimulates Cell Proliferation and Function
- § Commonly Used In Cell Culture System Applications and Formulations
- § Relatively Long-Storage When Handled and Stored Properly Under Defined Conditions

Storage & Stability:

This product should be stored under specified conditions @ -20°C and used within the expiration date indicated on the product label. Do ***not use*** after the expiration date as specified on the label. ***Deterioration of liquid media*** may be recognized by any of the following characteristics, among others including: (a). color change, (b). granulation/ clumping, (c). insolubility, (d). and/or decrease in expected performance parameters. Any material described above should not be used and therefore discarded.

Ribonucleosides and Deoxyribonucleosides for MEM-Alpha, 500X Conc.., is relatively stable when handled and stored under specified conditions as stipulated on the label. Do not expose to light for prolonged periods as it is light-sensitive. For prolonged storage, store in the dark.

Instructions/Procedure:

1) Take a bottle of *Ribonucleosides and Deoxyribonucleosides for MEM-Alpha, 500X Conc.,* from specified storage conditions at -20°C and read the label. Thaw to Room Temperature (15-30°C) prior to use.
2) Ensure that the cap of the bottle is tight.
3) Gently swirl the solution in the bottle to ensure homogeneity.
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 and work according to established protocols.
6) *Ribonucleosides and Deoxyribonucleosides for MEM-Alpha, 500X Conc.,* should be diluted to a working concentration of 1X before use.

Quality Control:

Test	Specifications:
Appearance:	Clear Solution
Sterility:	Sterile

Auxiliary Products

Product Name	Catalog Number	Storage Temperature
Minimum Essential Medium-Alpha(MEM-A),with 1g/l D-Glucose(Low Glucose), with L-Glutamine,without Ribonucleosides and Deoxyribonucleosides	01-042-1	2-8°C
Grace's Insect Cell Medium	01-155-1	2-8°C
BME Amino Acids Solutions ,100X Conc., Without L-Glutamine	01-315-1	2-8°C
Basal Medium Eagle Vitamins Solution, 100X Conc.,	01-316-1	-20°C
MEM Amino Acids Solutions,50X Conc., Without L-Glutamine	01-325-1	2-8°C
MEM Vitamins Solution, 100X Conc.	01-326-1	-20°C
SDS Solution	01-890-1	Room Temperature(15-30°)
Dulbecco's Phosphate Buffered Saline(DPBS) without Calcium and Magnesium	02-023-1	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°)
Cell Dissociation Solution, Non-Enzymatic	03-071-1	2-8°C
Fetal Bovine Serum	04-001-1	-20°C
Fetal Bovine Serum(Qualified for Human Embryonic Stem Cells)	04-002-1	-20°C
Adult Bovine Serum	04-003-1	-20°C
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) Sullivan Jr. John B. Krieger, Gary R. Hazardous Materials Toxicology: Clinical Principles of Environmental Health. Williams & Wilkins: Baltimore, Maryland, pps.157, 940-945.
2) Barile, Frank A. Clinical Toxicology: Principles and Mechanisms. CRC Press: Boca Raton, Florida, 2004.
3) Lackie, J. M. The Dictionary of Cell & Molecular Biology, Academic Press: London, 2007
4) O'Neil, Maryadele *et. al*., The Merck Index, 14th Edition, Whitehouse Station, New Jersey,2006
5) Biological Industries (BI) Specifications
6) Current Edition USP/E Ph
7) Martindale The Extra Pharmacopeia, 28th Edition, Royal Pharmaceutical Society: London, England
8) Freshney, R.I. Animal Cell Culture: A Practical Approach, IRL Press, Oxford, p.25.