Technical Bulletin

Minimum Essential Medium Eagle (MEM)

AutoMod™, with Earle's salts, without L-glutamine and sodium bicarbonate, powder, suitable for cell culture

M0769

Product Information

Minimum Essential Medium (MEM), developed by Harry Eagle, is one of the most widely used of all synthetic cell culture media. Early attempts to cultivate normal mammalian fibroblasts and certain subtypes of HeLa cells revealed they had specific nutritional requirements that could not be met by Eagle's Basal Medium (BME). Subsequent studies using these and other cells in culture indicated additions to BME could be made to aid growth of a wider variety of fastidious cells.

MEM, which incorporates these modifications, includes higher concentrations of amino acids so the medium more closely approximates the protein composition of cultured mammalian cells. MEM has been used for cultivation of a wide variety of cells grown in monolayers. Optional supplementation of non-essential amino acids to the formulations that incorporate either Hanks' or Earle's salts has broadened the usefulness of this medium. The formulation has been further modified by optional elimination of calcium to permit growth of cells in suspension culture.

References MEM

1. Eagle, H., et al., myo-Inositol as an Essential Growth Factor for Normal and Malignant Human Cells in Tissue Culture. J. Biol. Chem., 214, 845- 847 (1956).
2. Eagle, H., Media for Animal Cell Culture. Tissue Culture Association Manual, 3, 517-520 (1976).
3. Eagle, H., Amino Acid Metabolism in Mammalian Cell Cultures. Science, 130, 432-437 (1959).
4. Eagle, H., Nutrition Needs of Mammalian Cells in Culture. Science, 122, 501 (1955).

MEM Auto-Mod

1. Yamane, I., et al., An Autoclavable Powdered Cultured Medium for Mammalian Cells. Proc. Soc. Exp. Biol. and Med., **127**, 335-336 (1968).
2. McLimans, W.F., et al., The Submerged Culture of Mammalian Cell: The Spinner Culture. J. of Immunology, **79**, 428-433 (1957).

Components

Inorganic Salts	M0769 (Powder) g/L
$CaCl_2$ (anhydrous)	0.2
$MgSO_4$ (anhydrous)	0.09767
KCl	0.4
NaCl	6.8
Na_2HPO_4 mono anhydrous USP	0.122
Sodium Succinate • $6H_2O$	0.1
Succinic Acid (free acid)	0.075
Amino acids	
L-Arginine • HCl	0.126
L-Cystine • 2HCl	0.0313
L-Histidine • HCl • H_2O	0.042
L-Isoleucine	0.052
L-Leucine	0.052
L-Lysine • HCl	0.0725
L-Methionine	0.015
L-Phenylalanine	0.032
L-Threonine	0.048
L-Tryptophan	0.01
L-Tyrosine FB	0.036
L-Valine	0.046
Vitamins	
Choline Bitartrate	0.0018
Folic Acid	0.001
myo-Inositol	0.002
Niacinamide	0.001
D-Panthothenic acid • ½Ca	0.001
Pyridoxal • HCl	0.001
Riboflavin	0.0001
Thiamine • HCl	0.001
Other	
Glucose	1
Phenol Red • Na	0.0064
L-Glutamine	0.292
$NaHCO_3$	2.2

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