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Product Information

Minimum Essential Medium Eagle (MEM) Alpha Modifications

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.

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 Alpha modification of MEM with Earle's Balanced Salts, commonly referred to as αMEM, contains non-essential amino acids, sodium pyruvate, and additional vitamins. These modifications were first described by Stanners for use in growing hybrid mouse and hamster cells.[1] The formulation is without the deoxyribonucleosides and ribonucleosides originally used in Stanners' studies.

	M0644	M0894	M4526	M0200	M6199	M8042	M0450	M6074
	[powder]	[powder]	[1×]	[1×]	[1×]	[1×]	[1×]	[1×]
COMPONENT	g/L	g/L	g/L	g/L	g/L	g/L	g/L	g/L
Inorganic Salts								
$CaCl_2 \cdot 2H_2O$	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
$MgSO_4$ (anhydrous)	0.09767	0.09767	0.09767	0.09767	0.09767	0.09767	0.09767	0.09767
KCl	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
$NaHCO_3$	—	—	2.2	2.2	2.2	2.2	2.2	2.2
NaCl	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Na_2HPO_4 (anhydrous)	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122
Amino acids								
L-Alanine	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
L-Alanyl-L-Glutamine	—	—	—	—	0.434	—	—	0.434
L-Arginine • HCl	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
L-Asparagine • H_20	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
L-Aspartic Acid	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
L-Cysteine • HCl • H_20	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
L-Cystine • 2HCl	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313	0.0313
L-Glutamic Acid	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
L-Glutamine	0.292	0.292	—	0.292	—	—	0.292	—
Glycine	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
L-Histidine • HCl • H_20	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042
L-Isoleucine	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
L-Leucine	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
L-Lysine • HCl	0.0725	0.0725	0.0725	0.0725	0.0725	0.0725	0.0725	0.0725
L-Methionine	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
L-Phenylalanine	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
L-Proline	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
L-Serine	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
L-Threonine	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
L-Tryptophan	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
L-Tyrosine • 2Na • $2H_20$	0.0519	0.0519	0.0519	0.0519	0.0519	0.0519	0.0519	0.0519
L-Valine	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046

Vitamins								
L-Ascorbic Acid • Na	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
D-Biotin	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Choline Chloride	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Folic Acid	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
myo-Inositol	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Lipoic Acid	—	—	0.0002	0.0002	0.0002	-	-	-
Niacinamide	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
D-Panthothenic Acid • ½Ca	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Pyridoxal • HCl	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Riboflavin	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Thiamine • HCl	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Vitamin B_{12}	0.00136	0.00136	0.00136	0.00136	0.00136	0.00136	0.00136	0.00136
Other								
Adenosine	0.01	—	—	—	—	0.01	0.01	0.01
Cytidine	0.01	—	—	—	—	0.01	0.01	0.01
2′-Deoxyadenosine	0.01	—	—	—	—	0.01	0.01	0.01
2′-Deoxycytidine • HCl	0.011	—	—	—	—	0.011	0.011	0.011
2′-Deoxyguanosine	0.01	—	—	—	—	0.01	0.01	0.01
Glucose	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Guanosine	0.01	—	—	—	—	0.01	0.01	0.01
Phenol Red • Na	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
Pyruvic Acid	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Thioctic Acid	0.0002	0.0002	—	—	—	0.0002	0.0002	0.0002
Thymidine	0.01	—	—	—	—	0.01	0.01	0.01
Uridine	0.01	—	—	—	—	0.01	0.01	0.01
ADD								
L-Glutamine	—	—	0.292	—	0.292	0.292	—	0.292
$NaHCO_3$	2.2	2.2	—	—	—	—	—	—

References

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3. 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).
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