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Product Information

Williams' Medium E

In 1971, Williams et al. described a procedure for enriching isolated hepatocyte cultures for polygonal epithelial cells and reducing the number of contaminating fibroblasts. This method was a sequential plating technique based on the observation that fibroblast-like cells adhere to a substrate more rapidly than epithelial cells. The isolated epithelial cells resulting from this treatment could then be cultured in a rich medium designated Williams' Medium D. Newborn animals were the source of cells used in these studies, as they were in most studies of liver cell culture. Since newborn liver is not functionally mature, further studies were conducted by Williams and Gunn to explore the possibility of culturing adult liver on a long-term basis. The medium developed during the course of these studies was designated Williams' Medium E. It has been shown to support the growth in long-term culture of adult liver epithelial cells.

	W4125	**W4128**	**W1878**	**W0397**
	[powder]	[1×]	[1×]	[1×]
COMPONENT	g/L	g/L	g/L	g/L
Inorganic Salts				
$CaCl_2$ (anhydrous)	0.2	0.2	0.2	0.2
$CuSO_4 \cdot 5H_2O$	0.0000001	0.0000001	0.0000001	0.0000001
$Fe(NO_3)_3 \cdot 9H_2O$	0.0000001	0.0000001	0.0000001	0.0000001
$MgSO_4$ (anhydrous)	0.0977	0.0977	0.0977	0.0977
$MnCl_2 \cdot 4H_2O$	0.0000001	0.0000001	0.0000001	0.0000001
KCl	0.4	0.4	0.4	0.4
$NaHCO_3$	—	2.2	2.2	2.2
NaCl	6.8	6.8	6.8	6.8
NaH_2PO_4 (anhydrous)	0.122	0.122	0.122	0.122
$ZnSO_4 \cdot 7H_2O$	0.0000002	0.0000002	0.0000002	0.0000002
Amino Acids				
L-Alanine	0.09	0.09	0.09	0.09
L-Arginine (free base)	0.05	0.05	0.05	0.05
L-Asparagine • H_2O	0.02	0.02	0.02	0.02
L-Aspartic Acid	0.03	0.03	0.03	0.03
L-Cysteine (free acid)	0.04	0.04	0.04	0.04
L-Cystine	0.02	0.02	0.02	0.02
L-Glutamic Acid	0.0445	0.0445	0.0445	0.0445
L-Glutamine	0.292	—	—	0.292
Glycine	0.05	0.05	0.05	0.05
L-Histidine (free base)	0.015	0.015	0.015	0.015
L-Isoleucine	0.05	0.05	0.05	0.05
L-Leucine	0.075	0.075	0.075	0.075
L-Lysine • HCl	0.08746	0.08746	0.08746	0.08746
L-Methionine	0.015	0.015	0.015	0.015
L-Phenylalanine	0.025	0.025	0.025	0.025
L-Proline	0.03	0.03	0.03	0.03
L-Serine	0.01	0.01	0.01	0.01
L-Threonine	0.04	0.04	0.04	0.04
L-Tryptophan	0.01	0.01	0.01	0.01
L-Tyrosine • 2Na • $2H_2O$	0.05045	0.05045	0.05045	0.05045
L-Valine	0.05	0.05	0.05	0.05

Vitamins				
Ascorbic Acid • Na	0.00227	0.00227	0.00227	0.00227
D-Biotin	0.0005	0.0005	0.0005	0.0005
Calciferol	0.0001	0.0001	0.0001	0.0001
Choline Chloride	0.0015	0.0015	0.0015	0.0015
Folic Acid	0.001	0.001	0.001	0.001
myo-Inositol	0.002	0.002	0.002	0.002
Menadione ($NaHSO_3$)	0.00001	0.00001	0.00001	0.00001
Niacinamide	0.001	0.001	0.001	0.001
D-Pantothenic Acid • ½ Ca	0.001	0.001	0.001	0.001
Pyridoxal • HCl	0.001	0.001	0.001	0.001
Retinol Acetate	0.0001	0.0001	0.0001	0.0001
Riboflavin	0.0001	0.0001	0.0001	0.0001
Thiamine•HCl	0.001	0.001	0.001	0.001
(+/–)-α-Tocopherol phosphate • 2Na	0.00001	0.00001	0.00001	0.00001
Vitamin B_{12}	0.0002	0.0002	0.0002	0.0002
Other				
D-Glucose	2.0	2.0	2.0	2.0
Glutathione (reduced)	0.00005	0.00005	0.00005	0.00005
Methyl Linoleate	0.00003	0.00003	0.00003	0.00003
Phenol Red • Na	0.0107	0.0107	—	—
Pyruvic Acid • Na	0.025	0.025	0.025	0.025
Add				
L-Glutamine	—	0.292	0.292	—
$NaHCO_3$	2.2	—	—	—
Grams of powder required to prepare 1 L	10.768	N/A	N/A	N/A

References

1. Williams, G.M., and Gunn, J.M., Long-Term Cell Culture of Adult Rat Liver Epithelial Cells. Exp. Cell Research, **89**, 139-142 (1974).
2. Williams, G.M. et al., Isolation and Long-Term Cell Culture of Epithelial-Like Cells From Rat Liver. Exp. Cell Research, **69**, 106-112 (1971).