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Product Information

MCDB Media

MCDB media were designed for the low-protein or serum-free growth of specific cell types using hormones, growth factors, trace elements or low levels of dialyzed fetal bovine serum protein (FBSP). Each MCDB medium was formulated (qualitatively and quantitatively) to provide a defined and optimally balanced nutritional environment that selectively promoted growth of a specific cell type. MCDB 105 and 110 are modifications of MCDB 104 medium, optimized for long-term survival and rapid clonal growth of human diploid fibroblast-like cells (WI-38, MRC-5, IMR-90) and of low-passage human foreskin fibroblasts using FBSP or hormone and growth factor supplements. MCDB 151, 201 and 302 are modifications of Ham's nutrient mixture F-12, designed for the growth of human keratinocytes, clonal growth of chicken embryo fibroblasts and chinese hamster ovary (CHO) cells using low levels of FBSP, extensive trace elements or no serum protein.

| | M 6395 | M 6520 | M 6645 | M 8537 |
|--|---------------|---------------|---------------|---------------|
| | (105) | (110) | (151) | (131) |
| COMPONENT | g/L | g/L | g/L | g/L |
| INORGANIC SALTS | | | | |
| NH ₄ VO ₃ | 0.000000585 | 0.000000585 | — | 0.0000006 |
| CaCl ₂ •2H ₂ O | 0.147 | 0.147 | 0.004411 | 0.2352 |
| CuSO ₄ •5H ₂ O | 0.00000025 | 0.00000025 | 0.0000025 | 0.0000012 |
| FeSO ₄ •7H ₂ O | 0.00139 | 0.00139 | 0.000417 | 0.000278 |
| MgCl•6H ₂ O | — | — | 0.122 | — |
| MgSO ₄ (anhyd) | 0.12038 | 0.12038 | — | 1.204 |
| MnSO ₄ | 0.000000151 | 0.000000151 | — | 0.0000002 |
| (NH ₄) ₂ MO ₄ •4H ₂ O | 0.00000124 | 0.00000124 | — | 0.0000037 |
| NiCl ₂ •6H ₂ O | 0.00000012 | 0.00000012 | — | 0.0000001 |
| KCl | — | 0.37275 | 0.11183 | 0.2982 |
| KH ₂ PO ₄ (anhyd) | 0.40827 | — | — | — |
| Na•Acetate (anhyd) | — | — | 0.30153 | — |
| NaCl | 6.546 | 6.546 | 7.599 | 6.4284 |
| NaSiO ₃ •9H ₂ O | 0.0001421 | 0.000142 | — | 0.002842 |
| Na ₂ HPO ₄ (anhyd) | — | 0.42594 | 0.284088 | 0.071 |
| Na ₂ SeO ₃ | 0.000005187 | 0.0000038 | — | 0.0000052 |
| SnCl ₂ •2H ₂ O | 0.000000113 | 0.000000113 | — | — |
| ZnSO ₄ •7H ₂ O | 0.000144 | 0.000144 | 0.000863 | 0.0000003 |
| AMINO ACIDS | | | | |
| L-Alanine | 0.00891 | 0.00891 | 0.00891 | 0.00267 |
| L-Arginine•HCl | 0.2107 | 0.2107 | 0.2107 | 0.06321 |
| L-Asparagine•H ₂ O | 0.015 | 0.015 | 0.015 | 0.01501 |
| L-Aspartic Acid | 0.01331 | 0.01331 | 0.00399 | 0.01331 |
| L-Cysteine•HCl•H ₂ O | 0.00878 | 0.00878 | 0.04204 | 0.03512 |
| L-Glutamic Acid | 0.01471 | 0.01471 | 0.01471 | 0.004413 |
| L-Glutamine | 0.3653 | 0.3653 | 0.8772 | 1.461 |
| Glycine | 0.00751 | 0.02252 | 0.00751 | 0.00225 |
| L-Histidine•HCl•H ₂ O | 0.02097 | 0.02097 | 0.01677 | 0.04192 |
| L-Isoleucine | 0.00394 | 0.00394 | 0.001968 | 0.0656 |
| L-Leucine | 0.01312 | 0.01312 | 0.0656 | 0.1312 |
| L-Lysine•HCl | 0.03654 | 0.03654 | 0.01827 | 0.1826 |
| L-Methionine | 0.00448 | 0.00448 | 0.004476 | 0.01492 |
| L-Phenylalanine | 0.00496 | 0.00496 | 0.004956 | 0.03304 |
| L-Proline | 0.03453 | 0.03453 | 0.03453 | 0.01151 |
| L-Serine | 0.01051 | 0.01051 | 0.06306 | 0.03153 |
| L-Threonine | 0.01191 | 0.01191 | 0.01191 | 0.01191 |
| L-Tryptophan | 0.00204 | 0.00204 | 0.00306 | 0.00408 |
| L-Tyrosine•2Na•2H ₂ O | 0.00784 | 0.00784 | 0.00392 | 0.02252 |
| L-Valine | 0.01172 | 0.01172 | 0.03513 | 0.1171 |

Formulas continued on next page

MCDB Media continued

| | M 6395 | M 6520 | M 6645 | M 8537 |
|---|---------------|---------------|---------------|---------------|
| | (105) | (110) | (151) | (131) |
| COMPONENT | g/L | g/L | g/L | g/L |
| VITAMINS | | | | |
| D-Biotin | 0.000007339 | 0.00000733 | 0.0000146 | 0.0000073 |
| Choline Chloride | 0.01396 | 0.01396 | 0.01396 | 0.01396 |
| Folic Acid | — | — | 0.00079 | — |
| Folinic Acid•Ca | 0.000000512 | 0.000000602 | — | 0.0005115 |
| myo-Inositol | 0.01802 | 0.01802 | 0.01802 | 0.007208 |
| Niacinamide | 0.00611 | 0.00611 | 0.0000366 | 0.006105 |
| D-Pantothenic Acid•½Ca | 0.000238 | 0.000238 | 0.000238 | 0.011915 |
| Pyridoxine•HCl | 0.0000617 | 0.0000617 | 0.0000617 | 0.002056 |
| Riboflavin | 0.000113 | 0.000113 | 0.0000376 | 0.0000038 |
| Thiamine•HCl | 0.000337 | 0.000337 | 0.000337 | 0.003373 |
| Vitamin B-12 | 0.000136 | 0.000136 | 0.000407 | 0.0000136 |
| OTHER | | | | |
| Adenine•HCl | 0.00172 | 0.00172 | 0.03088 | 0.0001716 |
| D-Glucose | 0.72064 | 0.72064 | 1.081 | 1.0 |
| HEPES | 5.958 | 5.958 | 6.6 | — |
| Linoleic Acid | 0.0000028 | — | — | — |
| Phenol Red•Na | 0.001242 | 0.001242 | 0.001242 | 0.0124212 |
| Putrescine•2HCl | 0.000000161 | 0.000000161 | 0.0001611 | 0.0000002 |
| Pyruvic Acid•Na | 0.11 | 0.11 | 0.055 | 0.11 |
| Thioctic Acid | 0.00000206 | 0.00000206 | 0.0002063 | 0.0000021 |
| Thymidine | 0.0000727 | 0.0000727 | 0.000727 | 0.0000242 |
| ADD | | | | |
| NaHCO ₃ | N/A | N/A | 1.176 | 1.18 |
| | | | | |
| Grams of powder required to prepare 1 L | 14.9 | 15.3 | 17.7 | 11.7 |

REFERENCES

1. Peehl, DM. and Ham, R.G., (1980). In Vitro, 16:526.
2. Bettger, W.J., et al., (1981) Rapid Clonal Growth and Serial Passage of Human Diploid Fibroblasts in a Lipid-Enriched Synthetic Medium Supplemented with Epidermal Growth Factor, Insulin, and Dexamethasone. Proc. Natl. Acad. Sci., USA, 78:9, 5588-5592.

MCDB Media continued

| | M 7403 | M 6770 | M 2021 |
|--|---------------|---------------|---------------|
| | (153) | (201) | (302) |
| COMPONENT | g/L | g/L | g/L |
| INORGANIC SALTS | | | |
| NH ₄ VO ₃ | 0.00000585 | 0.00000006 | 0.0000117 |
| CaCl ₂ •2H ₂ O | 0.004411 | 0.294 | 0.08821 |
| CuSO ₄ •5H ₂ O | 0.0000275 | 0.0000025 | 0.000025 |
| FeSO ₄ •7H ₂ O | 0.00139 | 0.001668 | 0.000834 |
| MgCl•6H ₂ O | 0.122 | — | 0.122 |
| MgSO ₄ (anhyd) | — | 0.18057 | — |
| MnSO ₄ | 0.00000151 | 0.00000075 | 0.00000151 |
| (NH ₄) ₂ MO ₄ •4H ₂ O | 0.0000124 | 0.00000618 | 0.0000124 |
| NiCl ₂ •6H ₂ O | 0.0000012 | 0.000000012 | — |
| KCl | 0.11183 | 0.22365 | 0.22365 |
| KH ₂ PO ₄ (anhyd) | — | — | — |
| Na•Acetate (anhyd) | 0.30153 | — | — |
| NaCl | 7.599 | 7.597 | 7.599 |
| NaSiO ₃ •9H ₂ O | 0.000142 | 0.000142 | — |
| Na ₂ HPO ₄ (anhyd) | 0.284088 | 0.07099 | 0.14198 |
| Na ₂ SeO ₃ | 0.0000038 | 0.000000865 | 0.00000173 |
| SnCl ₂ •2H ₂ O | 0.00000113 | — | — |
| ZnSO ₄ •7H ₂ O | 0.000144 | 0.000028744 | 0.000863 |
| AMINO ACIDS | | | |
| L-Alanine | 0.00891 | 0.00891 | 0.00891 |
| L-Arginine•HCl | 0.2107 | 0.0632 | 0.2107 |
| L-Asparagine•H ₂ O | 0.015 | 0.150 | 0.015 |
| L-Aspartic Acid | 0.00399 | 0.01331 | 0.01331 |
| L-Cysteine•HCl•H ₂ O | 0.04204 | 0.03513 | 0.01756 |
| L-Glutamic Acid | 0.01471 | 0.01471 | 0.01471 |
| L-Glutamine | 0.8772 | 0.14615 | 0.4386 |
| Glycine | 0.00751 | 0.00751 | 0.00751 |
| L-Histidine•HCl•H ₂ O | 0.01677 | 0.02097 | 0.02097 |
| L-Isoleucine | 0.001968 | 0.01312 | 0.00394 |
| L-Leucine | 0.0656 | 0.03935 | 0.01312 |
| L-Lysine•HCl | 0.01827 | 0.03654 | 0.03654 |
| L-Methionine | 0.00448 | 0.00448 | 0.00448 |
| L-Phenylalanine | 0.00496 | 0.00496 | 0.00496 |
| L-Proline | 0.03453 | 0.00576 | 0.03453 |
| L-Serine | 0.06306 | 0.03153 | 0.01051 |
| L-Threonine | 0.01191 | 0.03574 | 0.01191 |
| L-Tryptophan | 0.00306 | 0.00613 | 0.00204 |
| L-Tyrosine•Na | 0.00341 | 0.01135 | 0.007896 |
| L-Valine | 0.03513 | 0.03513 | 0.01172 |

Formulas continued on next page

MCDB Media continued

| | M 7403 | M 6770 | M 2021 |
|---|---------------|---------------|---------------|
| | (153) | (201) | (302) |
| COMPONENT | g/L | g/L | g/L |
| VITAMINS | | | |
| D-Biotin | 0.0000146 | 0.00000733 | 0.00000733 |
| Choline Chloride | 0.01396 | 0.01396 | 0.01396 |
| Folic Acid | 0.00079 | — | 0.001324 |
| Folinic Acid•Ca | — | 0.00000512 | — |
| myo-Inositol | 0.01802 | 0.01802 | 0.01802 |
| Niacinamide | 0.00003663 | 0.00611 | 0.0000366 |
| D-Pantothenic Acid•½Ca | 0.000238 | 0.000477 | 0.000238 |
| Pyridoxine•HCl | 0.00006171 | 0.0000617 | 0.0000617 |
| Riboflavin | 0.0000376 | 0.000113 | 0.0000376 |
| Thiamine•HCl | 0.000337 | 0.000337 | 0.000337 |
| Vitamin B-12 | 0.000407 | 0.000136 | 0.000136 |
| OTHER | | | |
| Adenine•HCl | 0.03088 | 0.00172 | — |
| D-Glucose | 1.081 | 1.441 | 1.8016 |
| HEPES | 6.6 | 7.149 | — |
| Hypoxanthine | — | — | 0.004083 |
| Linoleic Acid | — | 0.0000841 | 0.0000841 |
| Phenol Red•Na | 0.001242 | 0.001242 | 0.001242 |
| Putrescine•2HCl | 0.000161 | 0.000000161 | 0.000161 |
| Pyruvic Acid•Na | 0.055 | 0.055 | 0.11 |
| Thioctic Acid | 0.000206 | 0.00000206 | 0.000206 |
| Thymidine | 0.000727 | 0.0000727 | — |
| ADD | | | |
| NaHCO ₃ | 1.176 | N/A | 1.18 |
| Grams of powder required to prepare 1 L | 17.7 | 17.7 | 11.0 |

REFERENCES

1. Boyce, S.T. and Ham, R.G., (1983). Calcium-Regulated Differentiation of Normal Human Epidermal Keratinocytes in Chemically Defined Clonal Culture and Serum-Free Serial Culture. *J. Invest. Dermatol*, 81, 33-40.
2. McKeenan, W.L. and Ham, R.G., (1976). Stimulation of Clonal Growth of Normal Fibroblasts with Substrata Coated with Basic Polymers. *J. Cell Biol.*, 71, 727-734.
3. Hamilton, W.G. and Ham, R.G., (1977). Clonal Growth of Chinese Hamster Ovary Cell Lines in Protein-Free Media. *In Vitro*, 13:9, 537-547.