(MEM) Minimal Essential Medium

For various human clinical samples

Pub. No. MAN0018900 **Rev.** 1.0

WARNING! Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves. Safety Data Sheets (SDSs) are available from **thermofisher.com/support**.

Intended use

For *in vitro* diagnostic use

The isolation of human viruses from clinical samples using cell culture remains necessary because it is the only technique capable of providing a viable isolate that can be used for antiviral susceptibility testing. An additional advantage is that in contrast to most antigen and nucleic acid detection methods, viral culture allows detection of multiple viruses, not all of which may have been suspected at the time diagnostic culture was requested.

MEM cell culture media products are for professional use. They are used in medical laboratories by personnel who have received specialized education and training with regard to procedures utilizing In Vitro Diagnostic products. IVDs of these types are not intended as sole determinant in a diagnostic situation. Test results are interpreted by a healthcare professional as part of the clinical management of a patient.

Principle and explanation of procedure

MEM (Minimal Essential Medium) is one of the most commonly used of all cell culture media for diagnostic virology (1, 2). MEM can be used with a variety of suspension and adherent mammalian cells, including HeLa, BHK-21, 293, HEP-2, HT-1080, MCF-7, fibroblasts.

MEM was developed by Harry Eagle, based on his earlier formulation of Basal Medium Eagle (BME). MEM is available with Earle's salts for use in a CO_2 incubator, or with Hanks' salts for use without CO_2. This product is made with Earle's salts. MEM contains no proteins, lipids, or growth factors. Therefore, MEM requires supplementation, commonly with 10% Fetal Bovine Serum (FBS). MEM uses a sodium bicarbonate buffer system (2.2 g/L), and therefore requires a 5-10% CO_2 environment to maintain physiological pH.

Contents and storage

All quality control testing results are reported on lot-specific Certificate of Analysis available on our website: **thermofisher.com**.

Product	Cat. No.	Storage	Shelf life[1]
MEM (1X) [+] Earle's Salts [+] Non-Essential Amino Acids [-] L-Glutamine	10370021[2] 10370047[3] 10370070[3] 10370088[2]	2°C to 8°C Protect from light	24 months
MEM (1X) [+] Earle's Salts [-] L-Glutamine	11090073[2] 11090081[2] 11090099[2] 11090100[2]	2°C to 8°C Protect from light	24 months
MEM (1X) [+] Earle's Salts [+] L-Glutamine	11095072[2] 11095080[2] 11095098[2] 11095114[2]	2°C to 8°C Protect from light	12 months

CE IVD

For In Vitro Diagnostic Use.

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Product	Cat. No.	Storage	Shelf life[1]
MEM Vitamin Solution (100X)	11120001[3] 11120037[3] 11120052[2] 11120061[3] 11120062[3] 11120097[2]	-5°C to -20°C Protect from light	12 months
MEM AMINO ACIDS 50X [-] L-Glutamine	11130036[3] 11130051[2] 11130077[3] 11130097[2]	2°C to 8°C Protect from light	12 months
MEM NEAA (100X)	11140035[3] 11140050[2] 11140068[3] 11140076[2]	2°C to 8°C Protect from light	18 months
MEM (10X) [+] Earle's Salts [-] L-Glutamine [-] Sodium Bicarbonate	11430030[2] 11430098[2]	2°C to 8°C Protect from light	24 months
MEM (1X) [+] Hank's Salts [+] L-Glutamine	11575032[2] 11575098[2]	2°C to 8°C Protect from light	12 months
MEM (1X) [+] Earle's Salts [+] 25 mM HEPES [-] L-Glutamine	12360038[2] 12360098[2]	2°C to 8°C Protect from light	24 months
MEM ALPHA	12561049[2] 12561056[2] 12561072[2] 12561099[2]	2°C to 8°C Protect from light	12 months
MEM ALPHA	12571048[2] 12571063[2] 12571071[2] 12571089[2]	2°C to 8°C Protect from light	12 months
MEM (1X) [+] Earle's Salts [-] L-Glutamine	21090022[3] 21090055[3]	2°C to 8°C Protect from light	12 months
Medium 199 (2X)	21157029[3] 21157030[3]	2°C to 8°C Protect from light	12 months
Medium 199 (10X)	21180021[3] 21180022[3]	2°C to 8°C Protect from light	12 months
MEM (10X) [+] Earle's Salts [-] L-Glutamine	21430020[3] 21430079[3]	2°C to 8°C Protect from light	12 months

Product	Cat. No.	Storage	Shelf life[1]
MEM (1X) [+] Hank's Salts [+] L-Glutamine	21575022[3] 21575097[3]	2°C to 8°C Protect from light	12 months
Modified Eagle Medium (2X) [+] L-Glutamine	21935028[3] 21935029[3]	2°C to 8°C Protect from light	12 months
Medium 199 (1X) [+] Hank's Salts [+] L-Glutamine [+] 25 mM HEPES	22350029[3] 22350078[3]	2°C to 8°C Protect from light	12 months
MEM ALPHA W/O NUCLEOSIDES	22561021[3] 22561054[3]	2°C to 8°C Protect from light	12 months
MEM ALPHA W/NUCLEOSIDES	22571020[3] 22571038[3]	2°C to 8°C Protect from light	12 months
MEM (1X) [+] Earle's Salts [-] L-Glutamine	31095029[3] 31095052[3]	2°C to 8°C Protect from light	12 months
Medium 199 (1X) [+] Earle's Salts [+] L-Glutamine	31150022[3] 31150030[3]	2°C to 8°C Protect from light	12 months
Medium 199 (1X) [+] Earle's Salts [+] L-Glutamine [+] 1.25 g/L $NaHCO_3$	31153026[3] 31153027[3]	2°C to 8°C Protect from light	12 months
MEM (1X) [+] Earle's Salts [+] 25 mM HEPES [-] L-Glutamine	32360026[3] 32360034[3]	2°C to 8°C Protect from light	12 months
MEM ALPHA (1X), GlutaMAX-I [-] Ribonucleosides [-] Deoxyribonucleosides	32561029[3] 32561094[3]	2°C to 8°C Protect from light	12 months
MEM ALPHA	32561037[2] 32561102[2]	2°C to 8°C Protect from light	12 months
MEM ALPHA (1X), GlutaMAX-I [+] Ribonucleosides [+] Deoxyribonucleosides	32571028[3] 32571036[2] 32571093[3] 32571101[2]	2°C to 8°C Protect from light	10 months
MEM (1X), GlutaMAX-I [+] Earle's Salts	41090028[3] 41090036[2] 41090093[3] 41090101[2]	2°C to 8°C Protect from light	12 months
Medium 199 (1X), GlutaMAX-I [+] Earle's Salts	41150020[3] 41150087[3]	2°C to 8°C Protect from light	12 months

Product	Cat. No.	Storage	Shelf life[1]
MEM (1X), GlutaMAX-I [+] Earle's Salts [+] 25 mM HEPES	42360024[3] 42360081[3]	2°C to 8°C Protect from light	12 months
MEM	42360032[2] 42360099[2]	2°C to 8°C Protect from light	12 months
MEM (1X) [+] Earle's Salts [-] L-Glutamine	51200038[2] 51200046[3] 51200087[3] 51200098[2]	2°C to 8°C Protect from light	24 months

[1] Shelf life is determined from Date of Manufacture. Do not use beyond labeled expiration date.
[2] Manufacturer: Life Technologies Corporation | 3175 Staley Road | Grand Island, NY 14072
[3] Manufacturer: Life Technologies™ Ltd. | 3 Fountain Drive, Inchinnan Business Park | Paisley PA49RF, Scotland, United Kingdom |Tel: +44 (0)141 81416305

Precautions

Do not use the product if packaging, including bottles and vials, have been compromised and/or show evidence of microbial contamination, cloudy appearance, discoloration, drying, cracking, or other signs of deterioration.

CAUTION! Human samples are potentially biohazardous. Follow standard precautions for handling, storage and disposal.

WARNING! Do not use for injection or infusion! Please report any serious incidents in relation to the device to the manufacturer and the Competent Authority of the EU Member State in which the user and/or patient is established.

- Once opened, use MEM within 14 days for maximal growth performance.
- Avoid repeated warming/cooling and prolonged exposure to light.
- Do not use beyond labeled expiration date.
- All solutions that come into contact with clinical samples must be sterile. Always use proper aseptic techniques and work inside a laminar flow hood. Consult our **Gibco Cell Culture Basics** for aseptic handling.

Test protocol

There is no single type of cell culture that can support the growth of all medically relevant viruses. As such, virology laboratories must maintain several different cell culture types. The choice of cell line used for a specific specimen is determined by the information communicated from the ordering physician to the laboratory and by knowledge of the specimens usually isolated from a given specimen type.

Ready to-use commercial cell culture media undergoes strict quality control to ensure sterility, but may become contaminated while handling. Follow the below guidelines for sterile handling to avoid contamination.

- Always wipe your hand and work area with 70% ethanol.
- Wipe the outside of the containers, flasks, plates, and dishes with 70% ethanol before placing them in the cell culture hood.
- Avoid pouring media and reagents directly from bottles or flasks.
- Use sterile pipette tips and pipettes to work with liquids, and use each pipette tip only once to avoid cross-contamination. Do not unwrap sterile pipettes until they are ready to be used. Keep pipettes and tips within the clean work area.
- Do not talk while performing sterile procedures and perform your cell culture as rapidly as possible to minimize contamination.

Quality control

Standard evaluations for cell culture media are pH, osmolality, endotoxins and sterility testing for liquid products. All quality control testing results are reported on lot specific Certificate of Analysis available on our website: **thermofisher.com**.

Related products

Unless otherwise indicated, all materials are available through **thermofisher.com**.

Item	Source
MEM Amino Acids Solution (50X)	11130051
MEM Non-Essential Amino Acids Solution (100X)	11140050
MEM Vitamin Solution (100X)	11120052
L-Glutamine (200 mM)	A2916801
Antibiotic-Antimycotic (100X)	15240096
PBS, pH 7.4	10010031

References

1. Winn, W. C., & Koneman, E. W. (2006). Koneman's color atlas and textbook of diagnostic microbiology (6th ed.). Philadelphia: Lippincott Williams & Wilkins
2. WHO Guidelines on the Establishment of Virology Laboratories in Developing Countries, 2008.

3. Eisfeld AJ, Neumann G, Kawaoka Y. Influenza A virus isolation, culture and identification. Nat Protoc. 2014;9(11):2663-81.

Labeling symbols

The symbols present on the product label are explained in the following table.

	MANUFACTURER		USE BY
IVD	IN VITRO DIAGNOSTIC MEDICAL DEVICE		CONSULT INSTRUCTIONS FOR USE
REF	CATALOG NUMBER		CAUTION, CONSULT ACCOMPANYING DOCUMENTS
LOT	BATCH CODE		UPPER AND LOWER LIMITS OF TEMPERATURE
STERILE A	Sterilized using aseptic processing technique		PROTECT FROM LIGHT
CE	European Mark of Conformity	EC REP	AUTHORISED REPRESENTATIVE IN THE EUROPEAN COMMUNITY

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

Manufacturer:
Life Technologies Corporation |
3175 Staley Road |
Grand Island, NY 14072

Manufacturer:
Life Technologies™ Ltd. |
3 Fountain Drive, Inchinnan Business Park |
Paisley PA49RF, Scotland, United Kingdom |
Tel: +44 (0)141 81416305

EC REP
European Regulatory Affairs
Life Technologies Europe B.V.
Kwartsweg 2, 2665 NN Bleiswijk
The Netherlands
Tel: +31 (0) 10 714 5000

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Revision	Date	Description
1.0	12 November 2019	New document

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