MC3T3-E1

305187

GENERAL INFORMATION

Description

MC3T3-E1 is a pre-osteoblastic cell line derived from the calvaria of a mouse embryo. These cells are extensively utilized in the study of osteogenesis, particularly for examining the molecular and cellular mechanisms underlying bone formation and differentiation. The MC3T3-E1 cell line is known for its robust ability to differentiate into osteoblasts in vitro, a process that can be stimulated by ascorbic acid and beta-glycerophosphate. This differentiation is marked by the expression of key osteogenic markers such as alkaline phosphatase, osteocalcin, and type I collagen.
MC3T3-E1 cells are instrumental in research focused on bone biology, including the study of bone matrix deposition and mineralization. These cells provide a reliable model for investigating the effects of various drugs, hormones, and genetic modifications on osteoblast function and bone formation. Additionally, the MC3T3-E1 cell line is valuable in studying pathological conditions such as osteoporosis and other bone-related diseases. Their ease of culture and well-characterized response to osteogenic stimuli make them a preferred choice for researchers aiming to unravel the complexities of bone physiology and pathology.

Tissue	Bone, calvaria

Applications

In vitro osteoblast differentiation

Synonyms

- Mc3T3-E1
- MC3T3E1
- MC-3T3-E1
- MC 3T3-E1

CLASSIFICATION

Organism	Mouse
Sex	Unspecified
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Fibroblast-like
Cell type	Osteoblast
Tumourigenic	Yes, in immunodeficient mice
Doubling time	24 to 48 hours

IDENTIFIERS

Citation

MC3T3-E1 (Cytion catalog number 305187)

NCBI TaxID	10090

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Cellosaurus	CVCL_0409

EXPRESSION AND SUSCEPTIBILITY

Products

Collagen

HANDLING AND CULTURE

Culture medium

Alpha MEM, w: 2.0 mM stable Glutamine, w: Ribonucleosides, w: Deoxyribonucleosides, w: 1.0 mM Sodium pyruvate, w: 2.2g/L NaHCO3, w/o: Ascorbic acid (GIBCO, Catalog No. A1049001. We do not supply this product; please consider other suppliers. Please let us know if you need further assistance.)

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase

Subculturing

Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.

Fluid renewal	2 to 3 times per week

Thawing and culturing

Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit. Upon receipt, either store the cryovial immediately at temperatures below -150°C to ensure the preservation of cellular integrity, or proceed to step 3 if immediate culturing is required.
For immediate culturing, swiftly thaw the vial by immersing it in a 37°C water bath with clean water and an antimicrobial agent, agitating gently for 40-60 seconds until a small ice clump remains.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
Carefully open the disinfected vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of room-temperature culture medium, mixing gently.
Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
Gently resuspend the cell pellet in 10 ml of fresh culture medium. For adherent cells, divide the suspension between two T25 culture flasks; for suspension cultures, transfer all the medium into one T25 flask to promote effective cell interaction and growth.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

Sterility

Mycoplasma contamination is excluded using both PCR-based assays and luminescence-based mycoplasma detection methods.
To ensure there is no bacterial, fungal, or yeast contamination, cell cultures are subjected to daily visual inspections.

Freeze medium	As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.

Storage conditions

For long-term preservation, place vials in vapor-phase liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

Shipping conditions

Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately −78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.

DONOR

Breed / subspecies	C57BL/6
Donor age	1 day

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes