Product sheet

MC3T3-E1 Subclone 14 Cells | 305185

General information

Description	MC3T3-E1 Subclone 14 cells are a valuable resource in biological science, specifically in the study of osteoblasts. Derived from a C57BL/6 mouse calvaria, these cells were carefully selected based on their high alkaline phosphatase (ALP) activity while resting. This unique characteristic makes them an ideal model for investigating osteoblast differentiation and the formation of calcified bone tissue in vitro. As a preosteoblast cell type, MC3T3-E1 Subclone 14 cells exhibit a fibroblast morphology and are primarily associated with bone tissue derived from the calvaria. One of the notable features of MC3T3-E1 Subclone 14 cells is their ability to differentiate into osteoblasts and osteocytes. Through their extensive morphological and functional resemblance to primary calvarial osteoblasts, these cells offer a reliable platform for studying the extracellular matrix (ECM) signalling and behaviour associated with osteoblast differentiation. When cultured with ascorbic acid and inorganic phosphate at optimal concentrations (3 to 4 mM), MC3T3-E1 Subclone 14 cells exhibit remarkable levels of osteoblast differentiation. After just ten days, they form a well-mineralized ECM, providing researchers with a window into the intricate process of bone tissue formation. Moreover, these cells have been found to secrete collagen, an essential component of bone tissue, and express murine leukaemia inhibitory factor (MIF) in RNA. Such characteristics further contribute to their relevance in investigating various biological processes related to bone development and homeostasis. The MC3T3-E1 Subclone 14 cell line has also been employed in cutting-edge research. For instance, it has been utilized to propose an actin filament cytoskeleton analysis framework, offering insights into the complex intracellular architecture of osteoblasts. Additionally, researchers have explored the effects of biodegradable magnesium and magnesium alloys on these cells, studying their interactions with different materials and their impact on selected cellular properties. With their diverse applications, these cells are invaluable in 3D cell culture studies, providing a realistic in vitro model for investigating osteoblast behaviour and differentiation within a three-dimensional environment. Their relevance extends to various research fields, including tissue engineering, bone regeneration, and the development of therapeutic interventions for bone-related disorders.
Organism	Mouse
Tissue	Bone, calvaria
Applications	3D cell culture, Differentiation studies
Synonyms	MC3T3-E1 SUBCLONE 14

Characteristics

Age	Newborn
Gender	Unspecified
Morphology	Fibroblast
Growth properties	Adherent

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Identifiers / Biosafety / Citation

Citation	MC3T3-E1 Subclone 14 (Cytion catalog number 305185)
Biosafety level	1

Expression / Mutation

Protein expression	Collagen
Tumorigenic	Yes

Handling

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
Medium supplements	Supplement the medium with 10% FBS
Passaging solution	Accutase
Subculturing	Remove medium and rinse the adherent cells using PBS without calcium and magnesium (3-5 ml PBS for T25, 5-10 ml for T75 cell culture flasks). Add Accutase (1-2 ml per T25, 2.5 ml per T75 cell culture flask), the cell sheet must be covered completely. Incubate at ambient temperature for 8-10 minutes. Carefully resuspend the cells with medium (10 ml), centrifuge for 3 min at 300 g, resuspend cells in fresh medium and dispense into new flasks which contain fresh medium.
Split ratio	1:2 to 1:4
Fluid renewal	2 to 3 times per week
Freeze medium	CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

Handling of cryopreserved cultures	MC3T3-E1 Subclone 14 cells are shipped in a deep-frozen state on dry ice. Upon receipt, confirm that the vial remains frozen. For storage, place the cryovial immediately at temperatures below -150 degrees. If you plan to culture the cells immediately, swiftly thaw the vial by shaking it in a 37 degrees water bath with clean water and an antimicrobial agent for 40-60 seconds. Remove the vial once a small ice clump persists, ensuring it remains cold. Proceed with all subsequent steps under aseptic conditions. In a sterile flow hood, disinfect the cryovial with 70% ethanol. Then, gently open the vial and transfer the cell suspension into a 15 ml centrifuge tube pre-filled with 8 ml of room temperature culture medium. Gently mix the cells. For cell separation, centrifuge at 300 x g for 3 minutes and dispose of the supernatant. Skipping centrifugation is optional, although any residual freezing medium should be removed after 24 hours. Resuspend the pellet gently in 10 ml of fresh culture medium and divide between two T25 culture flasks. Follow the subculture protocol for subsequent steps.
Handling of proliferating cultures	One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in a 50 ml centrifuge tube. Spin down the collected medium at 300 x g for 3 minutes to collect the cells which may have detached during transit. If a cell pellet is visible, resuspend the cells in 5 ml of cell culture medium and transfer to a T25 cell culture flask. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Examine cell morphology and confluency using a microscope. Finally, incubate the flasks at 37 degrees Celsius for at least 24 hours.

Quality control / Genetic profile / HLA

Sterility	Mycoplasma contamination is rigorously 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.
STR profile	**M_18-3**: 15 **M_4-2**: 20. Mrz **M_6-7**: 17 **M_3-2**: 14 **M_19-2**: 13 **M_7-1**: 26. Feb **M_1-1**: 16,17 **M_Sex**: x,Y **M_8-1**: 16 **M_2-1**: 16 **M_15-3**: 22. Mrz **M_6-4**: 18 **M_11-2**: 16 **M_1-2**: 19 **M_17-2**: 16 **M_12-1**: 17 **M_5-5**: 17 **M_X-1**: 28 **M_13-1**: 16 **Human D4/D8**: -