Product sheet

MLE-12 Cells | 305314

General information

Description	MLE-12 is a murine lung epithelial cell line established from distal respiratory epithelium using transgenic mice expressing the simian virus 40 (SV40) large tumor antigen under the control of the human surfactant protein C (SP-C) promoter. This cell line is characterized by its ability to maintain certain properties of alveolar type II cells, such as the expression of surfactant proteins SP-B and SP-C, which are crucial for pulmonary surfactant synthesis and lung function. MLE-12 cells also display key morphological features of alveolar type II cells, including microvilli and multivesicular bodies, though they lack some features like lamellar bodies in later passages. The MLE-12 cell line is widely used to study surfactant protein regulation, secretion, and pulmonary responses to stimuli. It secretes phospholipids in response to various secretagogues such as ATP and phorbol esters, mimicking aspects of type II alveolar cell function. While this secretion is robust in early passages, it diminishes in later passages, along with changes in receptor-mediated responses. This model is particularly valuable for exploring mechanisms underlying respiratory distress syndromes and surfactant deficiencies. Additionally, the cell line offers insights into pulmonary carcinogenesis, given its derivation from SV40-driven tumorigenesis. MLE-12 cells serve as a tool for elucidating the pathways of surfactant protein processing and testing therapeutic strategies for surfactant replacement. Their maintenance of SP-C expression, a marker specific to the alveolar epithelium, makes them a relevant in vitro model for investigating lung-specific processes and diseases.
Organism	Mouse
Tissue	Lung
Disease	Normal
Synonyms	MLE 12, MLE12, Murine Lung Epithelial-12

Characteristics

Breed/Subspecies	FVB/N-Tg(SFTPC-TAg)5.1Jaw transgenic
Age	5 months
Gender	Female
Morphology	Epithelial-like
Cell type	Epithelial cell

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Growth properties	Adherent

Regulatory Data

Citation	MLE-12 (Cytion catalog number 305314)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_3751
GMO Status	GMO-S1: This murine lung epithelial cell line (MLE-12) contains an SV40 T-Antigen construct introduced via transfection, supporting immortalization of primary lung epithelial cells. The insert is stably integrated. This classification applies only within Germany and may differ elsewhere.

Biomolecular Data

Protein expression	Genes expressed: lung surfactant proteins B, C (SP-B, SP-C)
Tumorigenic	Yes, in nude mice
Viruses	Transformant: Simian virus 40 (SV40)

Handling

Culture Medium	DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)
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.

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Fluid renewal	2 times per week
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.
Thawing and Culturing Cells	1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit. 2. 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. 3. 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. 4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening. 5. 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. 6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium. 7. 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. 8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.
Incubation Atmosphere	37°C, 5% CO_2, humidified atmosphere.
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.

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.

Quality Control & Molecular Analysis

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.