MCF10A

305026

GENERAL INFORMATION

Description

The MCF10A human mammary epithelial cell line, established from the mammary gland of a 36-year-old female with fibrocystic disease, serves as a model for studying the intricacies of normal breast cell function, transformation, and the epithelial to mesenchymal transition critical in invasive breast carcinoma transition.
As a non-tumorigenic epithelial cell line derived from benign proliferative breast tissue, MCF10A cells are instrumental in mammary cell studies, offering insights into breast tumor progression and the dynamics of tumor cells in mammospheres. MCF10 A cells, characterized by their three-dimensional growth in collagen and their ability to form acinar structures in mixed Matrigel, provide a reliable model for analyzing the impact of oncogenes and studying the mammosphere formation, which is crucial for understanding the properties of mammary progenitor cells and their role in cancer research.
The MCF10A cell line, while exhibiting a basal-like phenotype, express a combination of luminal and stem-like markers, as well as epithelial-cell markers such as cytokeratins and milk proteins. Their responsiveness to insulin, glucocorticoids, cholera enterotoxin, and epidermal growth factor (EGF) underscores the importance of growth factors and hormones in the proliferation and survival of human breast tissue cells. The MCF 10A model, provides a window into the genomic signaling pathways that govern cell behavior and phenotype in 3D culture, offering a platform for immunohistochemistry and immunofluorescence staining to visualize cellular processes.
These cells are crucial for studying the transition of mammary cells during breast cancer development, including the role of lipid oxidation product genotoxicity and the impact of dietary components like soybean trypsin inhibitor on cell function. Furthermore, the MCF 10A cell line's comparison with other lines such as MCF7 (which is tumorigenic and estrogen receptor-positive) and MCF10F (another non-tumorigenic line but with different characteristics) enriches breast cancer research by providing diverse models for understanding the spectrum of non-invasive to highly metastatic phenotypes.

Tissue	Mammary gland, breast

Synonyms

- MCF-10A
- MCF 10A
- MCF.10A
- MCF10A
- MCF10-A
- MCF10a
- MCF-10 Attached
- Michigan Cancer Foundation-10A

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial
Tumourigenic	No

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IDENTIFIERS

Citation

MCF10A (Cytion catalog number 305026)

NCBI TaxID	9606
Cellosaurus	CVCL_0598

HANDLING AND CULTURE

Culture medium

DMEM:Ham's F12 (1:1), w: 3.1 g/L Glucose, w: 2.5 mM L-Glutamine, w: 15 mM HEPES, w: 0.5 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion article number 820400a)

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

Supplements

Supplement the medium with 5% horse serum, 20 ng/mL EGF, 0,5 microgram/mL Hydrocortison, 10 microgram/mL Insulin. Add 100 ng/mL cholera toxin if needed.

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

Donor age	36 years

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

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