Product sheet

MCF10A Cells | 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.
Organism	Human
Tissue	Mammary gland, breast
Synonyms	MCF-10A, MCF 10A, MCF.10A, MCF10A, MCF10-A, MCF10a, MCF-10 Attached, Michigan Cancer Foundation-10A

Characteristics

Age	36 years
Gender	Female
Morphology	Epithelial
Growth properties	Adherent

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Regulatory Data

Citation	MCF10A (Cytion catalog number 305026)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_0598

Biomolecular Data

Tumorigenic	No

Handling

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)
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
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.

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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.