

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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Identifiers / Biosafety / Citation

Citation	MCF 10A (Cytion catalog number 305026)
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Biosafety level	1
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Expression / Mutation

Tumorigenic	No
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Handling

Culture Medium	DMEM:Ham's F12, w: 3.1 g/L Glucose, w: 1.6 mM L-Glutamine, w: 15 mM HEPES, w: 1.0 mM Sodium pyruvate, w: 1.2 g/L NaHCO ₃ (Cytion article number 820400a)
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Medium 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.
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Passaging solution	Accutase
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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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Split ratio	1:2 to 1:4
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Fluid renewal	2 to 3 times per week
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Freeze medium	CM-1 (Cytion catalog number 800100)
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Handling of cryopreserved cultures

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.

Quality control / Genetic profile / HLA

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.

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STR profile

Amelogenin: x,x
CSF1PO: 10,12
D13S317: 8,9
D16S539: 11,12
D5S818: 10,13
D7S820: 10,11
TH01: 8,9.3
TPOX: 9,11
vWA: 15,17
D3S1358: 14,18
D21S11: 28,3
D18S51: 18,19
Penta E: 13,14
Penta D: 10,12
D8S1179: 14,16
FGA: 22,24
D6S1043: 12,18
D2S1338: 21,26
D12S391: 17,2
D19S433: 13,15