Product sheet

MRC-5 Cells | 300395

General information

Description	MRC-5 cells, a human lung fibroblast cell line derived from the lung tissue of a 14-week-old male fetus in 1966, are extensively utilized in the production of certain vaccines, including those for hepatitis A, polio, rabies, and more. The susceptibility to various human viruses, notably human poliovirus 1, herpes simplex virus, and vesicular stomatitis virus underscores the role of MRC5 cells in the discovery of antivirals, viral vaccines, vaccine safety and virus replication. MRC-5 and WI-38 cell lines are still used in producing vaccines for varicella, rubella, hepatitis A, and a version of rabies vaccine today. Recently, MRC-5 cells were modified to express the ACE2 receptor, and have been key in SARS research. The modified MRC5 human ace2 cells allow scientists to study how the SARS-CoV virus enters and replicates in host cells. This work has been vital for understanding the virus's behavior and developing targeted antiviral agents and treatments. The MRC5 fetal cell line's utility extends beyond vaccine production to include potential roles in cancer research, with the cell line being employed in studies exploring the tumor microenvironment and cancer cell interactions, owing to their capability to differentiate into multiple cell types, including osteocytes and chondrocytes. This has led to speculation about their similarity to mesenchymal stem cells (MSCs), given their fibroblast-like morphology and maintenance of a normal diploid karyotype over extensive in vitro expansion.
Organism	Human
Tissue	Lung
Applications	Vaccine production
Synonyms	MRC5, MRC 5, MRCV, MRC-V, Medical Research Council cell strain-5

Characteristics

Age	Fetus
Gender	Male
Cell type	Fibroblast
Growth properties	Adherent

Regulatory Data

Citation	MRC-5 (Cytion catalog number 300395)

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Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_0440

Biomolecular Data

Virus susceptibility	Not susceptible to SARS coronavirus 2 (SARS-CoV-2) infection (COVID-19)
Karyotype	MRC5 is a diploid cell line with a modal chromosome number of 46.

Handling

Culture Medium	EMEM (MEM Eagle), w: 2 mM L-Glutamine, w: 2.2 g/L NaHCO3, w: EBSS (Cytion article number 820100a)
Supplements	Supplement the medium with 10% FBS and 1% NEAA
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.
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.