

MEC-1 Cells | 305434

General information

Description

The MEC-1 cell line is derived from a patient with chronic lymphocytic leukemia (CLL) in the prolymphocytoid transformation stage. It serves as a critical model for investigating the biology of B-cell malignancies, particularly the molecular mechanisms underpinning CLL and its responses to therapies. MEC-1 cells are characterized by the expression of CD19 and CD5 markers, consistent with their origin in CLL, and they are widely used to study the mechanisms of chemoresistance and metabolic adaptations in leukemia.

Research utilizing MEC-1 cells has provided insights into the interplay between the tumor microenvironment and leukemia cell survival. For instance, this cell line has been instrumental in identifying mechanisms of resistance to targeted therapies, such as the Bcl-2 antagonist venetoclax. In resistant MEC-1 derivatives (MEC-1 VER), overexpression of p38 MAPK and alterations in pro-apoptotic and anti-apoptotic protein expression have been observed. This highlights the potential of targeting pathways like p38 MAPK and the immunoproteasome to overcome drug resistance.

Under hypoxic conditions, MEC-1 cells exhibit metabolic reprogramming that supports their survival and proliferation. This adaptation involves increased expression of glucose transporters like GLUT1 and GLUT3, as well as shifts in glycolysis and lactate production, which are regulated by hypoxia-inducible factors (HIFs). Additionally, studies involving CRISPR/Cas9-mediated deletion of specific microRNAs, such as miR-155, have revealed their role in regulating MEC-1 cell metabolism and proliferation under hypoxic stress, providing further avenues for therapeutic intervention.

Organism

Human

Tissue

Peripheral blood

Disease

Chronic lymphocytic leukemia

Synonyms

MEC1

Characteristics

Age

61 years

Gender

Male

Ethnicity

Caucasian

Morphology

Lymphoblast-like

Cell type

B cell

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Growth properties

Suspension, singular cells and slightly adherent, small aggregates

Regulatory Data**Citation** MEC-1 (Cytion catalog number 305434)**Biosafety level** 1**NCBI_TaxID** 9606**CellosaurusAccession** CVCL_1870**Biomolecular Data****Viruses** Transformant: Epstein-Barr virus (EBV)**Mutational profile** Mutation: TP53, p.Gln317Profs*20 (c.949dupC) (c.949_950insC), homozygous; Gene fusion: R3HCC1L-HTRA1**Handling****Culture Medium** IMDM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 25 mM HEPES, w: 1.0 mM Sodium pyruvate, w: 3.024 g/L NaHCO₃ (Cytion article number 820800a)**Supplements** Supplement the medium with 10% FBS**Seeding density** 3-5*10⁵/ml**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% CO₂, 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

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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.