MEC-1

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.

Tissue	Peripheral blood
Disease	Chronic lymphocytic leukemia

Synonyms

- MEC1

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent and suspension
Biosafety level	1

CHARACTERISTICS

Morphology	Lymphoblast-like
Cell type	B cell

IDENTIFIERS

Citation

MEC-1 (Cytion catalog number 305434)

NCBI TaxID	9606
Cellosaurus	CVCL_1870

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EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: TP53, p.Gln317Profs*20 (c.949dupC) (c.949_950insC), homozygous; Gene fusion: R3HCC1L-HTRA1

Viruses

Transformant: Epstein-Barr virus (EBV)

HANDLING AND CULTURE

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)

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

Supplements

Supplement the medium with 10% FBS

Seeding density	3-5*10^5/ml
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	61 years

Ethnicity	Caucasian

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