

MOLT-3 Cells | 300116

General information

Description

MOLT-3 is a human T lymphoblast cell line derived from the peripheral blood of a 19-year-old male patient with acute lymphoblastic leukemia (ALL), specifically during a relapse following prior chemotherapy. This cell line was deposited by Dr. J. Minowada and is closely related to the MOLT-4 cell line, both originating from the same patient. MOLT-3 cells are widely used in research on immune system disorders, immunology, and immuno-oncology, making it an important model for studying T-cell leukemia and the immune response to various treatments.

As a suspension cell line, MOLT-3 exhibits typical T-cell markers, including high expression of CD5 (97%) and CD7 (97%), along with CD1 and CD4. This cell line is also characterized by elevated terminal deoxynucleotidyl transferase (TdT) activity, which is commonly associated with immature lymphoid cells. MOLT-3 is valuable for studying T-cell differentiation, receptor signaling, and apoptosis, especially in the context of T-cell acute lymphoblastic leukemia (T-ALL). Due to its growth properties and well-characterized antigen expression, it is frequently utilized in drug screening and therapeutic research for leukemia treatments.

Additionally, MOLT-3 cells do not produce immunoglobulins or contain detectable Epstein-Barr virus (EBV), which makes them an excellent model for studying T-cell-specific pathways without interference from B-cell characteristics. The cell line's response to various experimental manipulations further enhances its application in immuno-oncology, particularly for exploring potential therapeutic interventions targeting T-cell malignancies.

Organism	Human
Tissue	Peripheral blood
Disease	Acute lymphoblastic leukemia (ALL)
Synonyms	Molt-3, MOLT 3, Molt 3, MOLT3, Molt3

Characteristics

Age	19 years
Gender	Male
Ethnicity	Caucasian
Morphology	Round cells
Cell type	T lymphocyte

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Growth properties Suspension

Regulatory Data

Citation MOLT-3 (Cytion catalog number 300116)

Biosafety level 1

NCBI_TaxID 9606

CellosaurusAccession CVCL_0624

Biomolecular Data

Antigen expression CD1(+), CD5(+), CD7(+), CD11a(+)
(Greenberg et al. 1988).

Karyotype Hypertetraploid

Handling

Culture Medium RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO₃ (Cytion article number 820700a)

Supplements Supplement the medium with heat-inactivated 10% FBS

Doubling time 24 to 48 hours

Subculturing Maintain cultures by periodically adding or replacing the medium. Initiate cultures with a density of 5×10^5 cells/ml and keep the cell concentration within the range of 3×10^5 to 1×10^6 cells/ml for optimal growth.

Seeding density 0.5 to 1×10^5 cells/ml

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 $300 \times g$ 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

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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.