Product sheet

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

Identifiers / Biosafety / Citation

Citation	MOLT-3 (Cytion catalog number 300116)
Biosafety level	1

Expression / Mutation

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)
Medium supplements	Supplement the medium with 10% FBS, 1 mM sodium pyruvate, 1% NEAA
Doubling time	24 to 48 hours
Subculturing	Maintain cultures by periodically adding or replacing the medium. Initiate cultures with a density of 2 x 10^5 cells/ml and keep the cell concentration within the range of 1 x 10^5 to 1 x 10^6 cells/ml for optimal growth.
Seeding density	0.5 to 1 x 10^5 cells/ml
Freeze medium	As a cryopreservation medium, 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.

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,y **CSF1PO**: 11,12,13 **D13S317**: 12,13 **D16S539**: 11,14,15 **D5S818**: 12,13 **D7S820**: 7,8,9,10 **TH01**: 6,8 **TPOX**: 8 **vWA**: 17,18 **D3S1358**: 15,16,17 **D21S11**: 29,30,31,32 **D18S51**: 12,13,16,17 **Penta E**: 14,16 **Penta D**: 8,13 **D8S1179**: 9,13,14,15 **FGA**: 19,21,25 **D1S1656**: 15.3,16,16.3 **D6S1043**: 14,15,16 **D2S1338**: 23,24 **D12S391**: 17,19,20 **D19S433**: 14,15,16
HLA alleles	**A***: '01:01:01, '25:01:01 **B***: '18:01:01, '57:01:01 **C***: '06:02:01, '12:03:01 **DRB1***: '07:01:01, '12:01:01 **DQA1***: '02:01:01, '05:05:01 **DQB1***: '02:02:01, '03:01:01 **DPB1***: '02:01:02 **E**: '01:01:01, '01:xx