MOLT-4

300115

GENERAL INFORMATION

Description

MOLT-4 is a T lymphoblast cell line derived from the peripheral blood of a 19-year-old male patient with Acute lymphoblastic leukemia (ALL) in relapse in 1971. It is a sister cell line of MOLT-3, while MOLT-4 shows an unusual T-cell antigen receptor gamma-chain gene (T-gamma) rearrangement. MOLT-4 cells have a doubling time of around 30 hours, grow in suspension, and are tumorigenic in untreated nude mice, anti-lymphocyte serum-treated mice, and x-irradiated mice.
MOLT-4 cells have a hypertetraploid chromosome number with the modal chromosome number of 95 occurring in 24% of cells but show stable and recurrent structural abnormalities of chromosomes and longer telomere length. MOLT-4 expresses a variety of T cell markers including CD1, CD2, CD3A, CD3B, CD3C, CD4, CD5, CD6, and CD7. They also express high levels of terminal deoxynucleotidyl transferase (TdT).
The MOLT-4 cell line does not produce immunoglobulin or Epstein-Barr virus. The patient from whom the cells were derived had received prior multidrug chemotherapy. There is a G -> A mutation at codon 248 of the p53 gene, and P53 is not expressed. The line was initially contaminated with mycoplasma but has since been cured with antibiotics.

Tissue	Peripheral blood
Disease	Adult T acute lymphoblastic leukemia

Synonyms

- Molt-4
- MOLT 4
- Molt 4
- MOLT.4
- MOLT4
- Molt4
- GM02219
- GM02219C
- GM2219C
- GM02219D

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Suspension
Biosafety level	1

CHARACTERISTICS

Morphology	Round cells
Cell type	T lymphocyte

Karyotype

Hypertetraploid. Modal number: 96. Two x and two Y chromosomes.

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IDENTIFIERS

Citation

MOLT-4 (Cytion catalog number 300115)

NCBI TaxID	9606
Cellosaurus	CVCL_0013

EXPRESSION AND SUSCEPTIBILITY

Protein expression

P53 positive

Antigen expression

CD1 (49%), CD2 (35%), CD3 A (26%) B (33%) C (34%), CD4 (55%), CD5 (72%), CD6 (22%), CD7 (77%)

Mutational profile

G -> A mutation at codon 248 of the p53 gene, P53 is not expressed (Rodrigues, 1990).

Viruses

The cells do not produce immunoglobulin or Epstein-Barr virus (Minowada, 1972).

Products

High levels of terminal deoxynucleotidyl transferase (TdT) are produced

HANDLING AND CULTURE

Culture medium

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

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

Supplements

Supplement the medium with 10% FBS

Subculturing

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

Seeding density	1 x 10^5 cells/cm^2
Fluid renewal	2 to 3 times per week
Post-thaw recovery	24 to 48 hours

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	19 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