

MOLT-4 Cells | 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.

Organism Human**Tissue** Peripheral blood**Disease** Adult T acute lymphoblastic leukemia**Synonyms** Molt-4, MOLT 4, Molt 4, MOLT.4, MOLT4, Molt4, GM02219, GM02219C, GM2219C, GM02219D**Characteristics****Age** 19 years**Gender** Male**Ethnicity** Caucasian**Morphology** Round cells**Cell type** T lymphocyte**Growth properties** Suspension**Identifiers / Biosafety / Citation**

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Citation MOLT-4 (Cytion catalog number 300115)

Biosafety level 1

Expression / Mutation

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%)

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

Products High levels of terminal deoxynucleotidyl transferase (TdT) are produced

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

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

Handling

Culture Medium RPMI 1640, w: 2.1 mM stable Glutamine, w: 2.0 g/L NaHCO₃ (Cytion article number 820700a)

Medium supplements Supplement the medium with 10% FBS

Subculturing Maintain cultures by periodically adding or replacing the medium. Initiate cultures with a density of 2×10^5 cells/ml and keep the cell concentration within the range of 1×10^5 to 1×10^6 cells/ml for optimal growth.

Seeding density 1×10^5 cells/cm²

Fluid renewal 2 to 3 times per week

Freezing recovery 24 to 48 hours

Freeze medium CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

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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 $300 \times g$ for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium. Optionally, skip centrifugation but remove any remaining freezing medium after 24 hours.
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

CSF1PO: 11,12
D13S317: 12,13
D16S539: 11,14
D5S818: 12
D7S820: 8,10,11
TH01: 6,8
TPOX: 8
vWA: 17,18
D3S1358: 15,16
D21S11: 28,29,30
D18S51: 12,13,17
Penta E: 14,15,16
Penta D: 8,12,13
D8S1179: 9,13,14
FGA: 22,24

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: 01:01:01G