MDS-L

305826

GENERAL INFORMATION

Description

MDS-L is a human myelodysplastic syndrome (MDS)-derived cell line originally established from the MDS92 cell line, which itself was derived from the bone marrow of a patient with MDS exhibiting a del(5q) chromosomal abnormality. While MDS92 contained a heterogeneous mix of myeloid cells at varying stages of differentiation, MDS-L represents a blastic subline with more uniform features characteristic of immature myeloid progenitor cells. MDS-L retains interleukin-3 (IL-3) dependency for proliferation in vitro, mirroring the cytokine sensitivity seen in primary MDS progenitor cells. The line harbors multiple genetic alterations, including homozygous TP53 mutations and additional acquired mutations in NRAS and CEBPA. These alterations collectively reflect the clonal evolution and leukemic transformation potential typical of high-risk MDS.

MDS-L has been widely used as a model to investigate the molecular mechanisms underlying MDS pathogenesis, differentiation block, and therapeutic resistance. One significant finding using MDS-L was the demonstration that forced expression of granulocyte colony-stimulating factor receptor (G-CSFR) via retroviral transduction enabled granulocytic differentiation upon G-CSF stimulation. This was evidenced by morphological changes, increased CD11b expression, and enhanced nitroblue tetrazolium (NBT) reduction activity-indicative of terminal granulocyte maturation. These results revealed the intrinsic capacity of MDS-L to differentiate if the appropriate signaling components are restored, offering insights into potential gene therapy approaches targeting differentiation defects in MDS.

In addition to genetic and functional studies, MDS-L has been instrumental in characterizing the role of histone modifications in disease progression. Notably, the histone H3-K27M mutation, commonly associated with pediatric gliomas but rare in hematologic malignancies, was identified in MDS-L and found to inhibit EZH2-mediated histone methylation. This epigenetic alteration led to widespread reduction in H3-K27 methylation and was linked to altered expression of tumor suppressor genes such as p16. MDS-L sublines with or without this mutation-derived through differential IL-3 culture conditions-have further allowed exploration of epigenetic heterogeneity within MDS and its implications for IL-3-dependent growth and therapeutic response. These unique properties make MDS-L a powerful in vitro and in vivo model for studying the molecular evolution and therapeutic targeting of MDS and its transformation into acute myeloid leukemia.

Tissue	Bone marrow
Disease	Myelodysplastic syndrome

Synonyms

- MDSL

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Suspension
Biosafety level	1

IDENTIFIERS

Citation

MDS-L (Cytion catalog number 305826)

NCBI TaxID	9606
Cellosaurus	CVCL_A8QV

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EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: CEBPA, Simple, p.Gln311Ter (c.931C>T), Heterozygous, H3C3, Simple, p.Lys28Met (c.83A>T), Heterozygous, NRAS, Simple, p.Gly12Ala (c.35G>C), Heterozygous, TP53, Simple, c.672+1G>A, Homozygous, Note=Splice donor mutation

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 and 20 ng/ml IL-3 human recombinant

Dissociation reagent	None

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	52 years
Ethnicity	Japanese

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.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

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

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