CCRF-CEM

300147

GENERAL INFORMATION

Description

CCRF-CEM cells are a type of human T lymphoblasts commonly used in immuno-oncology and immunology research. These cells were isolated from the peripheral blood of a 4-year-old female Caucasian with acute lymphoblastic leukemia (ALL).
CCRF-CEM grow in suspension and can reach high cell density when cultured in spinner flasks. Karyotype analysis of CCRF-CEM cells showed a modal number of 47 chromosomes, ranging from 41 to 95. They show no consistent loss or gain of specific chromosomes and no marker chromosomes. However, 28% of cells with 45 chromosomes showed C- and 53% of all cells had an extra D, and 35% had an additional F.
CCRF-CEM cells are tumorigenic and can cause tumours in Syrian hamsters. These cells express CD3, CD5, CD7, and CD4 genes and antigens. Additionally, isoenzyme analysis showed ADA, 1; ES-D, 1; G6PD, B; GLO-I, 1; PEP-D, 1; PGD, C; PGM1, 1; PGM3, 0. These cells are reported to be free of virus particles as determined by electron microscopy.
A study has shown that the combination of resveratrol and prednisolone induced apoptosis in CCRF-CEM cells in a time- and dose-dependent manner. The combination treatment showed synergistic effects on the overexpression of BAx and the downregulation of BCL2.

Tissue	Peripheral blood
Disease	Leukemia

Synonyms

- CCRF/CEM
- CCRFCEM
- CCRF.CEM
- CCRF CEM
- CCRF
- CEM
- CEM-CCRF
- CEM-CCRF (CAMR)
- CCRF/CEM/0
- CEM/0
- CEM-0
- CCRF-CEM/S
- GM03671
- GM03671C

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Suspension
Biosafety level	1

CHARACTERISTICS

Morphology	Polymorph cells, big nuclei, formation of microvilli
Cell type	T lymphoblast

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Tumourigenic	Yes, in nude mice
Ploidy status	Aneuploid
MSI status	Instable (MSI)
Doubling time	24 hours

IDENTIFIERS

Citation

CCRF-CEM (Cytion catalog number 300147)

NCBI TaxID	9606
Cellosaurus	CVCL_0207

EXPRESSION AND SUSCEPTIBILITY

Protein expression

P53 negative

Antigen expression

CD3 B (37%), CD4 (50%), CD5 (95%), CD7 (77%)

Isoenzymes

G6PD, B

Viruses

EBV negative

Reverse transcriptase	Negative

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% heat-inactivated 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	Start new cultures at 1 x 10^5 cells/ml
Fluid renewal	Every 3 days
Post-thaw recovery	Allow the cells to recover from the freezing process for at least 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	4 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