

## CCRF-CEM Cells | 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.

#### Organism

Human

#### 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

### Characteristics

#### Age

4 years

#### Gender

Female

#### Ethnicity

Caucasian

#### Morphology

Polymorph cells, big nuclei, formation of microvilli

#### Cell type

T lymphoblast

#### Growth properties

Suspension

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**Regulatory Data**

<b>Citation</b>	CCRF-CEM (Cytion catalog number 300147)
<b>Biosafety level</b>	1
<b>NCBI_TaxID</b>	9606
<b>CellosaurusAccession</b>	CVCL_0207

**Biomolecular Data**

<b>Protein expression</b>	P53 negative
<b>Antigen expression</b>	CD3 B (37%), CD4 (50%), CD5 (95%), CD7 (77%)
<b>Isoenzymes</b>	G6PD, B
<b>Tumorigenic</b>	Yes, in nude mice
<b>Viruses</b>	EBV negative
<b>Reverse transcriptase</b>	Negative
<b>Ploidy status</b>	Aneuploid
<b>MSI-status</b>	Instable (MSI)

**Handling**

<b>Culture Medium</b>	RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)
<b>Supplements</b>	Supplement the medium with 10% heat-inactivated FBS
<b>Doubling time</b>	24 hours

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

**Seeding density** Start new cultures at  $1 \times 10^5$  cells/ml

**Fluid renewal** Every 3 days

**Post-Thaw Recovery** Allow the cells to recover from the freezing process for at least 48 hours.

**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.

### Thawing and Culturing Cells

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  $-150^{\circ}\text{C}$  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  $37^{\circ}\text{C}$  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.
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.

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**Incubation Atmosphere** 37°C, 5% CO<sub>2</sub>, humidified atmosphere.

**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.

**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.

## Quality Control & Molecular Analysis

**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.