CAL-51

305530

GENERAL INFORMATION

Description

The CAL-51 cell line is a human breast adenocarcinoma model established from a malignant pleural effusion of a patient with advanced breast cancer. Characterized by epithelial morphology and a normal diploid karyotype, CAL-51 is particularly notable for its triple-negative breast cancer (TNBC) profile, lacking estrogen receptor (ER), progesterone receptor (PR), and HER2 expression. The absence of these markers, commonly used as therapeutic targets, makes CAL-51 a valuable model for studying TNBC, an aggressive subtype of breast cancer with limited treatment options. CAL-51's tumorigenicity in immunocompromised mice and growth in soft agar demonstrate its malignant potential, making it suitable for in vitro and in vivo cancer research.
CAL-51 has also shown utility in studies investigating SARS-CoV-2 infection mechanisms. High expression of cellular entry factors ACE2 and TMPRSS2, along with neuropilin-1 (NRP1), renders CAL-51 permissive to SARS-CoV-2, facilitating viral entry and replication in cell culture. This makes CAL-51 a suitable model for exploring viral pathogenesis, as well as testing antiviral compounds and neutralizing antibodies targeted at SARS-CoV-2. Experiments demonstrate that therapeutic antibodies can block SARS-CoV-2 entry effectively in CAL-51 cells, highlighting its relevance as a model system for COVID-19 research and potential therapeutic evaluation.
In cancer research, CAL-51 is particularly useful for examining tumor heterogeneity, especially through its subpopulations of stem-like cancer cells known as side populations (SP), which express high levels of the ABCG2 transporter. SP cells in CAL-51 exhibit enhanced drug resistance and potential self-renewal, characteristics relevant to studies on cancer stem cell behavior and treatment resistance. As such, CAL-51 is a versatile model contributing to both cancer and viral infection studies, supporting research into challenging therapeutic areas such as TNBC and SARS-CoV-2.

Tissue	Breast
Disease	Carcinoma
Metastatic site	Pleural effusion

Synonyms

- CAL 51
- CAL51
- Cal51
- Centre Antoine Lacassagne-51

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like

IDENTIFIERS

Citation

CAL-51 (Cytion catalog number 305530)

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Banking information
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NCBI TaxID	9606
Cellosaurus	CVCL_1110

HANDLING AND CULTURE

Culture medium

DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)

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

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase

Subculturing

Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.

Seeding density	1.25 x 10^4 cells/cm^2

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	45 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

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