Product sheet

CAL-51 Cells | 305530

Renseignements généraux

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.
Organism	Human
Tissue	Breast
Disease	Carcinoma
Metastatic site	Pleural effusion
Synonyms	CAL 51, CAL51, Cal51, Centre Antoine Lacassagne-51

Caractéristiques

Age	45 years
Gender	Female
Ethnicity	Caucasian
Morphology	Epithelial-like

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Growth properties	Monolayer, adherent

Données réglementaires

Citation	CAL-51 (Cytion catalog number 305530)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_1110

Données biomoléculaires

Manipulation

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)
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	1.25×10^4 cells/cm^2
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°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 x 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.
Incubation Atmosphere	37°C, 5% CO_2, 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.

Contrôle de la qualité et analyse moléculaire

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.