A431

300112

GENERAL INFORMATION

Description

The A431 cell line, derived from a solid epidermoid carcinoma tumor in an 85-year-old female patient, is a human tumor cell line with an epithelial morphology, typically growing in clusters. The A-431 cell line is extensively utilized in cancer, toxicity, and immuno-oncology studies, serving as a positive control for epidermal growth factor (EGF) receptor expression due to its high receptor density.
Upon binding of EGF to its receptor (EGFR) on the surface of A431 cells, a rapid tyrosine phosphorylation of membrane proteins occurs, triggering a cascade of intracellular signaling pathways. These pathways include the MAPK/ERK and PI3K/AKT pathways, which are pivotal in regulating cell cycle progression, survival, and proliferation.
EGFR stimulates cell proliferation at low concentrations, whereas at higher concentrations, it inhibits growth and induces terminal differentiation in A431 cells. This dynamic response to EGFR underscores the cell line's utility in exploring cell signaling pathways and the cell cycle in the context of cancer.
A-431 cell-derived xenograft models are used for studying tumor behavior in a live environment and evaluating anticancer therapies. These models help assess how treatments such as EGF supplementation and radiation, affect tumor growth and highlight the cells' sensitivity to radiation.
In summary, the A-431 cell line serves as an invaluable human epidermoid carcinoma cell model, facilitating a deeper understanding of EGFR signaling, tumor biology, and the development of therapeutic interventions aimed at combating epidermoid carcinoma and other related cancers.

Tissue	Epidermoid
Disease	Squamous cell carcinoma

Synonyms

- A-431
- A431/P

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like, flat polygonal
Tumourigenic	Yes, in immunosuppressed mice

Karyotype

Six marker chromosomes with rearrangements: der(6), der(7), der(17), der(21), dic(13,14), and dic(14,18). Amplification of the C-MYC oncogene at 8q24 in two marker chromosomes: dup(8)(q24) and der(15)t(8,15)(q22,p11).

IDENTIFIERS

Citation

A431 (Cytion catalog number 300112)

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NCBI TaxID	9606
Cellosaurus	CVCL_0037

EXPRESSION AND SUSCEPTIBILITY

Receptors expressed

EGF-binding sites

Protein expression

P53 positive

Isoenzymes

G6PD, B, PGM1, 1, PGM3, 1, ES-D, 1, Me-2, 0, AK-1, 1, GLO-1, 2

Mutational profile

BRAF V600Ewt

Products

HBp17

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 x 10^4 cells/cm^2 will result in a confluent monolayer within 4 days.
Fluid renewal	2 to 3 times per week
Post-thaw recovery	After thawing, plate the cells at 5 x 10^4 cells/cm^2 and allow the cells to recover from the freezing process and to adhere for at least 24 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	85 years

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