NCI-H1781

305731

GENERAL INFORMATION

Description

The NCI-H1781 cell line is a human non-small cell lung carcinoma (NSCLC) model derived from a lung adenocarcinoma. This cell line is particularly noteworthy for harboring the ERBB2 (HER2) G776insV_G/C mutation, an in-frame insertion in exon 20 that is functionally activating. Such mutations are known drivers in a subset of lung cancers and make NCI-H1781 a useful model for studying HER2-targeted therapies and resistance mechanisms. The ERBB2 mutation in NCI-H1781 contributes to constitutive kinase activation and downstream signaling via pathways such as PI3K/AKT and MAPK, thereby supporting cell proliferation and survival independently of external growth factors.
In molecular profiling studies, NCI-H1781 demonstrates elevated levels of ERBB2 transcript and protein, consistent with its genetic alteration. Additionally, this cell line is often employed in pharmacogenomic investigations, as its sensitivity to HER2 inhibitors such as lapatinib or afatinib can vary depending on cellular context and combinatorial targeting strategies. It also exhibits resistance to EGFR inhibitors, which distinguishes it from EGFR-mutant lung cancer models and underscores the therapeutic relevance of HER2-specific targeting. Given its well-characterized genetic background and robust growth properties in vitro, NCI-H1781 serves as a reliable preclinical model for testing HER2-targeted compounds and exploring mechanisms of therapeutic resistance in lung adenocarcinoma.

Tissue	Metastatic
Disease	Minimally invasive lung adenocarcinoma
Metastatic site	Pleural effusion

Synonyms

- H1781
- H-1781
- NCIH1781

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

IDENTIFIERS

Citation

NCI-H1781 (Cytion catalog number 305731)

NCBI TaxID	9606
Cellosaurus	CVCL_1494

EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: PTEN, Simple, p.Gln245fs*6 (c.735_739delGCCGT), Heterozygous, TP53, Simple, p.Val157Phe (c.469G>T), Homozygous

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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% FBS

Dissociation reagent	Accutase
Fluid renewal	2 to 3 times per week

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	66 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.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

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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