Product sheet

NCI-H1781 Cells | 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.
Organism	Human
Tissue	Metastatic
Disease	Minimally invasive lung adenocarcinoma
Metastatic site	Pleural effusion
Synonyms	H1781, H-1781, NCIH1781

Characteristics

Age	66 years
Gender	Female
Ethnicity	Caucasian
Growth properties	Adherent

Regulatory Data

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Citation	NCI-H1781 (Cytion catalog number 305731)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_1494

Biomolecular Data

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

Handling

Culture Medium	RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)
Supplements	Supplement the medium with 10% FBS
Dissociation Reagent	Accutase
Fluid renewal	2 to 3 times per week
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.

Quality Control & Molecular Analysis

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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.