NCI-H2122

305600

GENERAL INFORMATION

Description

The NCI-H2122 cell line is a human non-small cell lung cancer (NSCLC) model derived from an adenocarcinoma patient. It is notable for its harboring of a KRAS G12C mutation, a hallmark of NSCLC that leads to constitutive activation of the MAPK signaling pathway. This cell line is extensively used in studies focusing on therapeutic interventions targeting KRAS G12C and associated downstream pathways, particularly those involving MEK and ERK inhibitors. Research utilizing NCI-H2122 has highlighted its role in understanding drug resistance mechanisms and in optimizing combination therapies.

Preclinical studies using the NCI-H2122 cell line have demonstrated its utility in exploring resistance to MAPK pathway inhibitors. For instance, CRISPR screening approaches have identified MAPK7 (ERK5) as a critical mediator of pathway reactivation following MEK inhibition, suggesting potential combination strategies using MEK inhibitors like cobimetinib and MAPK7 inhibitors. The line also serves as a model for evaluating the efficacy of small molecule inhibitors, including those targeting PI3K and BRAF, which are relevant in combination with KRAS-specific treatments.

NCI-H2122 is also employed in investigating metabolic vulnerabilities in NSCLC. Studies have implicated serine biosynthesis and the folate cycle as metabolic pathways contributing to resistance against targeted therapies, such as BRAF inhibitors. Metabolic modulators like methotrexate and serine-deprivation strategies have been tested on this cell line, providing insights into overcoming drug resistance and identifying new metabolic targets for therapeutic exploitation.

Tissue	Lung
Disease	Adenocarcinoma
Metastatic site	Pleural effusion

Synonyms

- H2122
- H-2122
- NCIH2122

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like, Lymphoblast-like

IDENTIFIERS

Citation

NCI-H2122 (Cytion catalog number 305600)

NCBI TaxID	9606
Cellosaurus	CVCL_1531

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EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: KRAS, p.Gly12Cys (c.34G>T), homozygous; Mutation: TP53, p.Gln16Leu (c.47A>T), heterozygous; Mutation: TP53, p.Cys176Phe (c.527G>T), heterozygous

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

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 TrypLE Express, 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.

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	46 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