Product sheet

NCI-H441 Cells | 305219

General information

Description	The NCI-H441 cell line, also known as H441, established in 1982 from the pleural effusion of a male patient with papillary adenocarcinoma of the lung, is a well-characterized epithelial adenocarcinoma cell line. These cells are extensively utilized in biological research for their relevance to lung epithelial biology, making them a critical in vitro model for studies on transepithelial transport and the epithelial barrier function. The NCI-H441 cell line serves as a vital tool in advancing our understanding of pulmonary drug disposition and tumor kinetics. Its use in 3D cell culture models allows for the detailed study of how drugs are absorbed, distributed, metabolized, and excreted within the lung environment, closely mimicking in vivo conditions. Given their origin and characteristics, NCI-H441 cells are particularly valuable in research focused on the distal lung and related diseases, including lung adenocarcinoma, serving as a stable and relevant cell model for understanding the mechanisms of lung diseases and evaluating potential therapeutic interventions. NCI-H441 cells are instrumental in 3D cell culture, high-throughput screening, and toxicology studies, providing valuable data on cellular responses and the efficacy of therapeutic agents. A notable application of the human cell line H441 involves their use as a transfection host for expressing pulmonary surfactant protein (SP-B), utilizing the firefly-Luc reporter system, which emphasizes their role in inhalation biopharmaceutics and transepithelial transport studies. This capability, alongside their expression of mRNA and protein for major surfactant apoprotein (SP-A), highlights the cell line's significance in investigating lung function and disorders, especially those affecting surfactant regulation and synthesis.
Organism	Human
Tissue	Lung
Disease	Papillary adenocarcinoma
Metastatic site	Pericardial effusion
Synonyms	H441, H-441, NCI-H441-4, NCI-441, NCIH441

Characteristics

Age	33 years
Gender	Male
Ethnicity	European
Cell type	Club cell

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Growth properties	Adherent

Regulatory Data

Citation	NCI-H441 (Cytion catalog number 305219)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_1561

Biomolecular Data

Karyotype	The NCI-H441 cell line exhibits a hyperdiploid karyotype, with a modal chromosome number of 52, though variations from 44 to 59 chromosomes have been documented.

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
Doubling time	58 hours
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.
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.