NCH612

300121

GENERAL INFORMATION

Description

NCH612 is a patient-derived oligodendrocytic cell line that originates from human brain tissue and serves as a relevant research model for anaplastic oligodendroglioma (WHO grade III). This cell line harbors the IDH1 R132H mutation, a hallmark genetic alteration frequently associated with oligodendrogliomas. The mutation leads to epigenetic modifications, including the glioma CpG island methylator phenotype (G-CIMP), which contributes to tumor development and progression. Notably, NCH612 exhibits a partial deletion of chromosome arms 1p and 19q, a genetic characteristic commonly found in oligodendrogliomas and associated with better prognosis and response to certain therapies. Studies have demonstrated that NCH612 is particularly sensitive to the DNA methyltransferase inhibitor decitabine (DAC). Treatment with DAC results in reduced cell proliferation and colony formation, primarily through the downregulation of TERT (telomerase reverse transcriptase) and the upregulation of p21, a cyclin-dependent kinase inhibitor involved in the DNA damage response. Interestingly, this sensitivity appears to be linked to the presence of both the IDH1 mutation and 1p/19q codeletion, as other IDH1-mutant glioma cell lines without this deletion, such as NCH1681, exhibit resistance to DAC. These findings suggest that epigenetic therapies like DAC could be particularly effective in IDH1-mutant anaplastic oligodendrogliomas with 1p/19q codeletion.
Further molecular investigations reveal that DAC treatment in NCH612 cells leads to the enrichment of pathways related to DNA replication, cell cycle regulation, and lysosomal function, shedding light on the drug's mechanism of action. The repression of TERT by DAC is mediated by p21, emphasizing the critical role of this pathway in the response to epigenetic therapy. Given its well-defined genetic and epigenetic profile, NCH612 represents a valuable in vitro model for studying the biology of anaplastic oligodendrogliomas and for developing targeted therapies aimed at IDH1-mutant tumors with 1p/19q codeletion.

Tissue	Brain
Disease	Anaplastic oligodendroglioma, WHO grade III, IDH1 mutant (R132H)

CLASSIFICATION

Organism	Human
Sex	Male
Biosafety level	1

IDENTIFIERS

Citation

NCH612 (Cytion catalog number 300121)

NCBI TaxID	9606
Cellosaurus	CVCL_x913

HANDLING AND CULTURE

Culture medium

DMEM:Ham's F12 (1:1), w: 3.1 g/L Glucose, w: 2.5 mM L-Glutamine, w: 15 mM HEPES, w: 0.5 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion article number 820400a)

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

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Supplements

Supplement the medium with 5 mg/L Heparin, 20 ng/mL bFGF, 20 microgram/L EGF, 5 mg/L Insulin, 100 mg/L Transferrin, 5,2 microgram/L Na-selenit, 6,3 microgram/L Progesteron, 161,1 microgram/L Putrescin, 50 mg/L Hydrocortinson

Subculturing

For subculturing spheroid cultures, begin by mechanically dissociating the spheroids through pipetting up and down 5 to 10 times using an Eppendorf pipette with 1000 µl filter tips. After this, centrifuge the mixture at 300g for 5 minutes at room temperature to pellet the cells. Discard the supernatant and resuspend the cell pellet in fresh culture medium. Finally, transfer the resuspended cells into new culture vessels to promote further spheroid formation. This approach ensures efficient spheroid breakdown and readies them for continued growth in a new environment.

Seeding density	1 x 10^5 cells/mL
Fluid renewal	Fresh medium must be added every 2to3 days (2to5 ml depending on the size of the cell culture flask).
Post-thaw recovery	Slow. After thawing allow the cells to recover from the freezing process for at least 48 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 50% basal medium + 40% FBS + 10% DMSO, 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	39 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.

Third-party agreements apply	Yes

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