Wilms3

300414

GENERAL INFORMATION

Description

The Wilms3 cell line was established from a primary Wilms tumor in a pediatric patient, characterized by a somatic WT1 mutation. Unlike many other Wilms tumor cell lines, Wilms3 harbors a heterozygous frameshift mutation in the WT1 gene (c.1293-1294insA, p.V432SfsX87), leading to the production of a truncated WT1 protein. This partial loss of WT1 function is associated with the development of tumors that display a stromal or mesenchymal phenotype. However, the WT1 mutation in Wilms3 is not homozygous, which adds complexity to its study, as it retains some WT1 function that can influence tumor biology differently compared to cell lines with complete WT1 loss.
Wilms3 also carries a mutation in the CTNNB1 gene, specifically affecting threonine 41 (p.T41A), which plays a critical role in the Wnt signaling pathway. This mutation stabilizes β-Catenin, preventing its degradation and leading to the constitutive activation of the Wnt pathway. The persistent activation of Wnt signaling drives cell proliferation and contributes to tumorigenesis in Wilms3, making it a key model for studying the impact of CTNNB1 mutations in the context of a partially functional WT1 background.
Phenotypically, Wilms3 cells exhibit a mesenchymal-like morphology, expressing vimentin and lacking cytokeratin, consistent with the stromal characteristics observed in the original tumor. These cells show limited differentiation potential, with the ability to undergo some mesenchymal differentiation under specific conditions. Proteomic analyses of Wilms3 have revealed the activation of several receptor tyrosine kinases (RTKs), including PDGFRβ and AXL, which support cell survival and proliferation. Additionally, downstream signaling pathways such as MAPK and PI3K/AKT are activated, reinforcing the malignant properties of Wilms3 cells.
One unique aspect of Wilms3 is its partial WT1 functionality, which provides a distinct perspective on how WT1 mutations contribute to Wilms tumor biology when the mutation is not complete. The interplay between WT1 and Wnt signaling in Wilms3 offers a valuable opportunity to study the nuanced roles these pathways play in tumor development. Overall, Wilms3 serves as an important model for investigating the molecular mechanisms underlying Wilms tumor in the presence of partial WT1 loss and constitutive Wnt pathway activation.

Tissue	Kidney
Disease	Wilms tumor

Applications

In vitro cell culture model. Biochemical studies

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Spindle-shaped
Cell type	Wilms cells

IDENTIFIERS

Citation

Wilms3 (Cytion catalog number 300414)

NCBI TaxID	9606

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Cellosaurus	CVCL_A5SF

EXPRESSION AND SUSCEPTIBILITY

Mutational profile

WT1 mutation status: homozygous c.1293-1294insA, p.V432fsx87, LOH: 11p11-11pter, CTNNB1 mutation status: wild type

HANDLING AND CULTURE

Culture medium

MSCGM kit (from Lonza)

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

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	11-12 months
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