Wilms1

300411

GENERAL INFORMATION

Description

The Wilms1 cell line was derived from a primary Wilms tumor sample obtained from a patient presenting with large bilateral kidney tumors, indicative of Wilms tumor, a pediatric nephroblastoma. This cell line harbors a homozygous nonsense mutation in the WT1 gene (c.149 C>A, p.S50X), which results in a truncated and non-functional WT1 protein. The WT1 gene, critical for kidney development and function, is frequently mutated in Wilms tumor, particularly in those with a stromal subtype that exhibits ectopic mesenchymal differentiation. Wilms1 cells, therefore, represent a unique in vitro model for studying the consequences of WT1 loss of function in tumor biology.
The Wilms1 cell line maintains a stable karyotype with no significant chromosomal abnormalities, allowing for reliable long-term culture. These cells exhibit a mesenchymal phenotype, characterized by the expression of vimentin and the absence of epithelial markers such as cytokeratin, consistent with their stromal origin. Additionally, the cell line demonstrates limited but notable mesenchymal differentiation capacity, including the ability to differentiate into muscle-like cells under appropriate conditions. This makes Wilms1 an invaluable tool for investigating the molecular mechanisms of mesenchymal differentiation and its deregulation in Wilms tumor pathogenesis.
Wilms1 has also been used to study the activation status of key signaling pathways involved in tumor progression. Proteomic analyses have shown that Wilms1 cells exhibit phosphorylation and activation of several receptor tyrosine kinases, including EGFR and PDGFRβ, as well as downstream MAPK signaling pathways. These findings highlight the relevance of the Wilms1 cell line in exploring targeted therapeutic approaches for Wilms tumor by dissecting the role of these pathways in cancer cell survival, proliferation, and differentiation.

Tissue	Kidney

Applications

In vitro cell culture model. Biochemical studies

Synonyms

- Wilms1-2l

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Spindle-shaped
Cell type	Wilms cells
Tumourigenic	Yes, in nude mice. Forms tumor with small cells consistent with Wilms' tumor (xenografts may not represent Wilm’s tumors completely, see E. Kunce Stroup 2017)

Karyotype

46, normal

Doubling time	24 hours

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IDENTIFIERS

Citation

Wilms1 (Cytion catalog number 300411)

NCBI TaxID	9606
Cellosaurus	CVCL_A5SC

EXPRESSION AND SUSCEPTIBILITY

Receptors expressed

Receptor tyrosine kinases EGFR, EphA7, PDGFRalpha, FGFR1, PDGFRbeta, AxL

Mutational profile

WT1 mutation status: homozygous c. 149 C>A, p.S50x, LOH: 11p11-11pter, CTNNB1 mutation status: heterozygous TCT>TTT, p.S45F

Viruses

HIV-1: negative, HBV: negative, HCV: negative

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.

Seeding density	1 x 10^4 cells/cm^2
Fluid renewal	1 to 2 times per week
Post-thaw recovery	Fast

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	2 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