Wilms2

300413

GENERAL INFORMATION

Description

The Wilms2 cell line was derived from a primary Wilms tumor in a pediatric patient with a germline WT1 mutation. This cell line is characterized by a homozygous nonsense mutation in the WT1 gene (c.1084 C>T, p.R362X), which results in the production of a truncated, non-functional WT1 protein. The loss of functional WT1, a gene essential for kidney development, is a hallmark of certain subtypes of Wilms tumor, particularly those associated with mesenchymal or stromal differentiation. The Wilms2 cell line is a significant model for studying the tumorigenic processes driven by WT1 loss, especially in the context of Wilms tumors that retain other critical genetic features.
Wilms2 cells also carry mutations in the CTNNB1 gene, which encodes β-Catenin, a key component of the Wnt signaling pathway. These mutations, specifically affecting serine 45, lead to the stabilization and accumulation of β-Catenin, resulting in the constitutive activation of the Wnt pathway. This activation is a known driver of cell proliferation and tumorigenesis in Wilms tumor, making Wilms2 a valuable model for understanding how aberrant Wnt signaling contributes to the development and progression of tumors with WT1 mutations.
In terms of phenotype, Wilms2 cells exhibit a mesenchymal-like morphology, expressing vimentin and lacking epithelial markers such as cytokeratin. This aligns with the tumor's stromal characteristics and underscores the role of WT1 in regulating mesenchymal-epithelial transitions during kidney development. Proteomic analyses of Wilms2 have identified activation of several receptor tyrosine kinases (RTKs), including PDGFRβ and AXL, which are known to support tumor cell survival and proliferation. Additionally, downstream pathways such as MAPK and PI3K/AKT are also activated, further contributing to the malignant properties of Wilms2 cells.
Overall, the Wilms2 cell line serves as an essential tool for exploring the molecular mechanisms of Wilms tumor driven by WT1 loss and aberrant Wnt signaling. Its genetic and phenotypic characteristics provide a robust platform for investigating potential therapeutic targets and for understanding the role of key signaling pathways in the pathology of Wilms tumors with a mesenchymal component.

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

Wilms2 (Cytion catalog number 300413)

NCBI TaxID	9606
Cellosaurus	CVCL_A5SE

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB

EXPRESSION AND SUSCEPTIBILITY

Mutational profile

WT1 mutation status: homozygous c.149 C>A, p.R326x, LOH: 11p11-11pter, CTNNB1 mutation status: heterozygous del TCT>TAT, p.S45Y

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	1 year
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

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB