MDCK-II

305233

GENERAL INFORMATION

Description

Madin-Darby Canine Kidney type II (MDCK-II) cells are an epithelial cell line derived from the kidney of an adult female cocker spaniel. These cells are widely used in biomedical research due to their unique ability to form tight junctions and polarized monolayers, which are characteristic features of epithelial tissues. MDCK-II cells exhibit robust growth and differentiation properties, making them an excellent model for studying epithelial cell biology, including cell polarity, transport processes, and barrier function.
The MDCK-II cell line is particularly valuable for investigating the mechanisms of virus-host interactions, especially for influenza virus research. The cells' ability to form polarized monolayers makes them ideal for studying the directional release and spread of viruses. Additionally, MDCK-II cells are frequently employed in drug transport and toxicity studies, as their well-defined tight junctions provide a reliable model for assessing the permeability and barrier function of epithelial cells. Their responsiveness to various growth factors and hormones further enhances their utility in diverse research applications.
Researchers also use MDCK-II cells to explore renal physiology and pathophysiology, given their origin from kidney tissue. This cell line provides insights into kidney epithelial cell function, including ion transport, fluid regulation, and cellular responses to injury. Overall, MDCK-II cells are a versatile and essential tool in the study of epithelial cell biology and related biomedical fields.

Tissue	Kidney
Disease	Normal kidney epithelium

Applications

Virology; epithelial transport studies; tight junction research; drug permeability assays; cell biology

Synonyms

- MDCK II
- MDCKII
- MDCK2
- MDCK-2
- MDCK Type II
- MDCKII-WT

CLASSIFICATION

Organism	Dog
Sex	Female
Growth properties	Adherent
GMO status	Non-GMO

GMO status details

No genetic modification; wildtype cell line

Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like
Cell type	Epithelial

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Doubling time	approx. 16-20 hours

IDENTIFIERS

Citation

MDCK-II (Cytion catalog number 305233)

NCBI TaxID	9615
Cellosaurus	CVCL_0424

HANDLING AND CULTURE

Culture medium

EMEM (MEM Eagle), w: 2 mM L-Glutamine, w: 2.2 g/L NaHCO3, w: EBSS (Cytion article number 820100a)

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

Supplements

Supplement the medium with 10% FBS and 1% NEAA

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.

Split ratio	1 to 5
Seeding density	2 to 5 x 10^4 cells/cm^2
Fluid renewal	2 to 3 times per week

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

Breed / subspecies	Cocker Spaniel
Donor age	Adult

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