Product sheet

NRK-52E Cells | 305196

General information

Description	The NRK-52E cell line, derived from the normal kidney of a rat, is an epithelioid cell line representing proximal tubular epithelial cells. This cell line is widely used in nephrology research, especially for studies on renal physiology, toxicology, and pathophysiology. NRK-52E cells display characteristic epithelial morphology with tight junctions, making them suitable for in vitro modeling of renal tubular function and barrier integrity. NRK-52E cells have been instrumental in studying mechanisms of apoptosis, cellular repair, and ion transport. For instance, the cell line has been used to investigate the effects of okadaic acid, a protein phosphatase inhibitor, revealing its role in inducing apoptotic pathways involving chromatin condensation, calcium influx, and mitochondrial changes. These studies have provided insights into the regulation of renal cell death and survival mechanisms during injury or disease. Furthermore, NRK-52E cells have been used to assess renal epithelial ion transport and barrier properties under various experimental setups, such as microfluidic systems that mimic physiological flow conditions. This includes research on sodium chloride reabsorption and transepithelial electrical resistance, which are critical for understanding electrolyte and water balance in renal physiology. These characteristics make NRK-52E a robust model for exploring renal tubular cell biology and therapeutic interventions in kidney diseases.
Organism	Rat
Tissue	Kidney
Synonyms	NRK 52E, NRK52E, NRK clone 52E, Normal Rat Kidney-52E, NRK-E52

Characteristics

Morphology	Epithelial
Growth properties	Adherent

Identifiers / Biosafety / Citation

Citation	NRK-52E (Cytion catalog number 305196)
Biosafety level	1

Expression / Mutation

Handling

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Culture Medium	DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 1.5 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)
Medium supplements	Supplement the medium with 10% FBS
Passaging solution	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	1:2 to 1:4
Fluid renewal	2 to 3 times per week
Freeze medium	CM-1 (Cytion catalog number 800100)

Handling of cryopreserved cultures

1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
2. 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.
3. 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.
4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
5. 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.
6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
7. 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.
8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

Quality control / Genetic profile / HLA

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.