Product sheet

NRK Cells | 305195

General information

Description	The NRK cell line, derived from a Rattus norvegicus (rat) kidney, is an invaluable tool in biological research. These cells possess an epithelial morphology, meaning they form sheets covering the organs' surfaces and protecting against foreign substances. Epithelial cells, like NRK cells, exhibit specific characteristics. They have a generous amount of cytoplasm and contain numerous granules. These cells serve various bodily functions, with some acting as absorptive or protective agents while others act primarily as secretory cells. In the case of the kidneys, the epithelial cells play a crucial role in the storage and subsequent secretion of excretory materials. This makes the NRK cell line particularly suitable for studying renal physiology. By utilizing these cells, researchers can investigate the intricate processes involved in kidney function and gain insights into various aspects of renal physiology. Moreover, the NRK cell line is not limited to studying renal physiology alone. These versatile cells can also be employed in cancer research. Their epithelial morphology and origin from a normal rat kidney make them an excellent model for investigating the behaviour and characteristics of cancer cells in a controlled environment. One application that leverages the unique properties of NRK cells is 3D cell culture. This technique involves growing cells in a three-dimensional matrix miming the natural cellular environment more closely than traditional two-dimensional culture. NRK cells can be cultured in this manner, allowing researchers to create complex tissue models that closely resemble the native structure of the kidney. This facilitates the study of cellular behaviour, interactions, and responses in a more physiologically relevant context. The NRK cell line is a valuable resource in biological research, specifically in cancer and renal physiology. These epithelial cells, derived from the kidney of an average rat, offer researchers the opportunity to delve into the intricacies of renal function and study cancer cells in a controlled laboratory setting. With their applicability in 3D cell culture, NRK cells enable the creation of realistic tissue models for comprehensive investigations into cellular behaviour and responses.
Organism	Rat
Tissue	Kidney
Synonyms	Normal Rat Kidney

Characteristics

Breed/Subspecies	Osborne-Mendel
Age	Adult
Morphology	Epithelial
Growth properties	Adherent

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Regulatory Data

Citation	NRK (Cytion catalog number 305195)
Biosafety level	1
NCBI_TaxID	10116
CellosaurusAccession	CVCL_3758

Biomolecular Data

Handling

Culture Medium	DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)
Supplements	Supplement the medium with 10% FBS
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.
Fluid renewal	2 to 3 times per week
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.

Thawing and Culturing Cells	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.
Incubation Atmosphere	37°C, 5% CO_2, humidified atmosphere.
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.
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.

Quality Control & Molecular Analysis

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.