Product sheet

MDBK (NBL-1) Cells | 600396

General information

Description	MDBK cells, short for Madin-Darby Bovine Kidney cells (also known as NBL-1), are an exceptional biological resource derived from the kidneys of apparently healthy adult Bos taurus, specifically male individuals. These cells grow adherently and possess an epithelial-like morphology. One of the remarkable applications of MDBK cells lies in their ability to facilitate in vitro studies on the expression of Eimeria bovis-derived antigens on the host cell surface membrane. Additionally, MDBK cells have been employed in investigations centred around the ubiquitination and degradation of signal transducer and activator of transcription 1 and 2 (STAT1 and STAT2) by the V proteins of paramyxoviruses, such as simian virus five and human parainfluenza virus type 2. With an average doubling time ranging from 24 to 35 hours, MDBK cells exhibit a moderate proliferation rate. The establishment of the MDBK cell line dates back to February 18, 1957, when S.H. Madin and N.B. Darby successfully derived it from the kidney of a healthy adult steer. Since then, these cells have become a cornerstone in biological research, enabling numerous breakthroughs in various scientific fields. The karyotype analysis of MDBK cells reveals a modal chromosome number of 51, indicating a hypodiploid state. Within the cell population, the hypodiploid condition manifests as a stemline chromosome number of 2n = 60, with a 2S component occurring in approximately 5% of the cells. Moreover, 11-14 marker chromosomes are typically present, comprising a combination of metacentric, submetacentric, and acro-telocentric chromosomes. Notably, the x chromosome appears monosomic, while no HSR chromosomes or DM's (double minutes) are observed. MDBK cells exhibit an array of applications in the realm of biological research. Their utility extends to 3D cell culture, enabling scientists to recreate complex tissue-like structures for advanced studies. Furthermore, MDBK cells are invaluable in high-throughput screening, facilitating the rapid and efficient screening of compounds or agents for various purposes. Additionally, these cells play a crucial role in toxicology studies, essential for evaluating the safety and potential adverse effects of substances on living organisms. Regarding viral susceptibility, MDBK cells demonstrate receptiveness to several pathogens, including Vesicular stomatitis Orsay (Indiana) virus, infectious bovine rhinotracheitis virus, bovine rhinotracheitis virus, bovine parvovirus, bovine adenovirus 2 and 3, bovine viral diarrhoea virus 1, and parainfluenza three virus. This susceptibility to a diverse range of viruses makes MDBK cells invaluable for investigating viral pathogenesis and evaluating antiviral strategies.
Organism	Bovine
Tissue	Kidney
Synonyms	MDBK (NBL-1), NBL-1, Madin-Darby Bovine Kidney, Madin Darby Bovine Kidney

Characteristics

Age	Adult
Gender	Male
Morphology	Epithelial-like
Growth properties	Monolayer, adherent

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Identifiers / Biosafety / Citation

Citation	MDBK (NBL-1) (Cytion catalog number 600396)
Biosafety level	1

Expression / Mutation

Viruses	The line was tested and shown to be free of bovine diarrhoea virus (BVD).
Virus susceptibility	The cells are susceptibled to bovine diarrhea virus, vesicular stomatitis (Indiana strain), infectious bovine rhinotracheitis virus, bovine parvovirus, bovine adenovirus I and III, and parainfluenza virus 3.
Virus resistance	Poliovirus 2
Reverse transcriptase	negative
Products	Keratin

Handling

Culture Medium	EMEM, w: 2 mM L-Glutamine, w: 1.5 g/L NaHCO3, w: EBSS, w: 1 mM Sodium pyruvate, w: NEAA (Cytion article number 820100c)
Medium supplements	Supplement the medium with 10% FBS
Passaging solution	Accutase
Subculturing	Remove medium and rinse the adherent cells using PBS without calcium and magnesium (3-5 ml PBS for T25, 5-10ml for T75 cell culture flasks). Add Accutase (1-2ml per T25, 2.5ml per T75 cell culture flask), the cell sheet must be covered completely. Incubate at ambient temperature for 8-10 minutes. Carefully resuspend the cells with medium (10 ml), centrifuge for 5 min at 300xg, resuspend cells in fresh medium and dispense into new flasks which contain fresh medium.
Split ratio	A ratio of 1:2 to 1:4 is recommended
Seeding density	1 x 10^4 cells/cm^2

Fluid renewal	Every 3 days
Freezing recovery	Fast
Freeze medium	CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)
Handling of cryopreserved cultures	MDBK (NBL-1) cells are shipped in a deep-frozen state on dry ice. Upon receipt, confirm that the vial remains frozen. For storage, place the cryovial immediately at temperatures below -150 degrees. If you plan to culture the cells immediately, swiftly thaw the vial by shaking it in a 37 degrees water bath with clean water and an antimicrobial agent for 40-60 seconds. Remove the vial once a small ice clump persists, ensuring it remains cold. Proceed with all subsequent steps under aseptic conditions. In a sterile flow hood, disinfect the cryovial with 70% ethanol. Then, gently open the vial and transfer the cell suspension into a 15 ml centrifuge tube pre-filled with 8 ml of room temperature culture medium. Gently mix the cells. For cell separation, centrifuge at 300 x g for 3 minutes and dispose of the supernatant. Skipping centrifugation is optional, although any residual freezing medium should be removed after 24 hours. Resuspend the pellet gently in 10 ml of fresh culture medium and divide between two T25 culture flasks. Follow the subculture protocol for subsequent steps.
Handling of proliferating cultures	One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in a 50 ml centrifuge tube. Spin down the collected medium at 300 x g for 3 minutes to collect the cells which may have detached during transit. If a cell pellet is visible, resuspend the cells in 5 ml of cell culture medium and transfer to a T25 cell culture flask. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Examine cell morphology and confluency using a microscope. Finally, incubate the flasks at 37 degrees Celsius for at least 24 hours.

Quality control / Genetic profile / HLA

Sterility	Mycoplasma contamination is rigorously 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.