VERO

605372

GENERAL INFORMATION

Description

VERO cells are widely used in developing vaccines, in the study of viral infections or malaria, and in tumor immunology and immunotherapy studies. VERO cells were derived from the kidney of an African green monkey in the 1960s by a group of Japanese scientists at Chiba University in Japan.
One of the critical characteristics of VERO cells is their rapid growth rate, with a population doubling time of approximately 24 hours. This, combined with their stability and high viral titers, makes them an ideal choice for vaccine production. As a prominent example, a Vero cell-derived vaccine for Japanese encephalitis is widely used and licensed in many countries worldwide.
Vero cells were pivotal in the development of vaccines for a plethora of infectious diseases, including the rubella virus, Ross River virus, herpes simplex virus, measles virus, and poliovirus. Vero cells are renowned for their capacity for virus production, growth, and maintenance under optimized culture conditions, making them an invaluable resource in viral vaccine production. The role of Vero cells extends to the generation of viral vectors, crucial for both vaccine development and tissue engineering applications, and virus isolation.
Different VERO cell lines, such as Vero 76 and the subclone Vero E6, offer unique characteristics suited to various research and production needs. Vero 76 cells are known for their robust growth and are widely used in vaccine production due to their high virus yield capabilities. Vero E6, on the other hand, exhibits specific properties that make it particularly useful for studying certain viruses, including enhanced sensitivity to the Ebola virus and SARS-CoV-2. This subclone's unique interaction with viruses makes it valuable for viral pathogenesis studies and antiviral drug screening.

Tissue	Kidney

Applications

Transfection host

Synonyms

- Vero
- VeroCCL81
- Vero 81
- Verda reno

CLASSIFICATION

Organism	African green monkey
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like

IDENTIFIERS

Citation

VERO (Cytion catalog number 605372)

NCBI TaxID	60711

Cellosaurus	CVCL_0059

EXPRESSION AND SUSCEPTIBILITY

Receptors expressed

Despite not being interferon deficient, VERO cell line possesses the interferon-alpha/beta receptor, allowing them to respond normally when recombinant interferon is added to their culture medium.

Mutational profile

Vero cells have a homozygous 9-Mb deletion on chromosome 12 that results in loss of the type I interferon gene cluster and the cyclin-dependent kinase inhibitors CDKN2A and CDKN2B.

Viruses

Verotoxin detection of virus in ground beef

Virus susceptibility

Poliovirus 1, 2, 3, Getah, Ndumu, Pixuna, Ross River, Semliki Forest, Paramaribo, Kokobera, Modoc, Murutucu, Germiston, Guaroa, Pongola, Tacaribe, SV-5, SV40, rubeola, rubellavirus, reovirus 1, 2, 3, simian adenoviruses

Reverse transcriptase	Negative

HANDLING AND CULTURE

Culture medium

DMEM:Ham's F12 (1:1), w: 3.1 g/L Glucose, w: 2.5 mM L-Glutamine, w: 15 mM HEPES, w: 0.5 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion article number 820400a)

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

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.

Seeding density	1 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

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.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

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