

VERO Cells | 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.

Organism Chlorocebus sabaeus (Green monkey)

Tissue Kidney

Applications Transfection host

Synonyms Vero, VeroCCL81, Vero 81, Verda reno

Characteristics

Age Adult

Gender Female

Morphology Epithelial-like

Growth properties Monolayer, adherent

Identifiers / Biosafety / Citation

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Citation	VERO (Cytion catalog number 605372)
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Biosafety level 1

Expression / Mutation

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.
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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
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Reverse transcriptase Negative

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.
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Handling

Culture Medium	DMEM:Ham's F12, w: 3.1 g/L Glucose, w: 1.6 mM L-Glutamine, w: 15 mM HEPES, w: 1.0 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion article number 820400a)
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Medium supplements Supplement the medium with 10% FBS

Passaging solution	Accutase
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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	A ratio of 1:3 is recommended
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Seeding density 1 x 10⁴ cells/cm²

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Fluid renewal 2 to 3 times per week

Freeze medium CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

Handling of cryopreserved cultures VERO 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.

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.