

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)
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Tissue	Kidney
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Applications	Transfection host
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Synonyms	Vero, VeroCCL81, Vero 81, Verda reno
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Characteristics

Age	Adult
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Gender	Female
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Morphology	Epithelial-like
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Growth properties	Monolayer, adherent
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Identifiers / Biosafety / Citation

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Citation VERO (Cytion catalog number 605372)

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.

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

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.

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)

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 A ratio of 1:3 is recommended

Seeding density 1×10^4 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

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. Optionally, skip centrifugation but remove any remaining freezing medium after 24 hours.
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.