Product sheet

VERO Cells | 605372

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

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

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Citation	VERO (Cytion catalog number 605372)
Biosafety level	1
NCBI_TaxID	60711
CellosaurusAccession	CVCL_0059

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.

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)
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

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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.

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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.

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.