Product sheet

HUVEC, single donor | 300605

General information

Description	Human Umbilical Vein Endothelial Cells (HUVECs) are primary cells derived from the endothelial layer of veins in the human umbilical cord. HUVECs are a pivotal model in vascular biology research due to their capacity to closely replicate many aspects of endothelial cell biology in vivo. These cells are extensively utilized to study endothelial functions, including angiogenesis, inflammation, and mechanisms of vascular permeability. HUVECs display several critical endothelial markers, such as von Willebrand factor, CD31, and endothelial nitric oxide synthase (eNOS), which affirm their endothelial origin and functionality. They are also capable of forming tube-like structures when cultured on Matrigel, demonstrating their potential for angiogenesis studies. The ability of HUVECs to respond to cytokines and growth factors makes them an excellent system for exploring cellular responses associated with vascular diseases such as atherosclerosis, hypertension, and thrombosis. Moreover, their reaction to shear stress can be studied in dynamic flow models, providing insights into the effects of blood flow on endothelial behavior. In pharmacological research, HUVECs are commonly employed to evaluate the efficacy and toxicity of vascular-targeting agents. Their straightforward isolation and the relative ease of culturing make them a valuable tool in both academic research and pharmaceutical development. These attributes underline the significance of HUVECs in advancing our understanding of vascular health and disease.
Organism	Human
Tissue	Umbilical vein
Applications	Human Umbilical Vein Endothelial Cells (HUVECs) are widely used in various biomedical research areas because they can quickly proliferate and differentiate into different types of endothelial cells, which line blood vessels. HUVECs have many research and drug discovery applications, including wound healing, angiogenesis, tissue engineering, inflammation, oncology, pharmacology, vascular modeling, and transfection.
Synonyms	Human Umbilical Vein Endothelial Cells

Characteristics

Ethnicity	Caucasian
Morphology	Endothelial
Cell type	Primary cells
Growth properties	Monolayer, adherent

Identifiers / Biosafety / Citation

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Citation	HUVEC, pooled (Cytion catalog number 300605)
Biosafety level	1

Expression / Mutation

Protein expression	Cytosplasmic VWF/ Factor VIII > 95% positive by immunofluorescence. Cytoplasmic uptake of Di-I-Ac-LDL > 95% positive by immunofluorescence. Cytoplasmic PECAM1 > 95% positive by immunofluorescence
Viruses	Negative for HIV-1, HBV, and HCV

Handling

Culture Medium	Endothelial Cell Growth Medium (Cytion article number 820731)
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 1:2 to 1:4 is recommended
Fluid renewal	Every 2 to 3 days
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.