Product sheet

HUVEC, single donor | 300605

General information

Description	HUVECs, or human umbilical vein endothelial cells, are primary cells commonly used in biomedical research to study vascular biology in vitro. These cells are isolated from the umbilical cord vein and are a model system for studying endothelial cell function. Endothelial cells line the inside of blood vessels and play a critical role in vascular homeostasis, angiogenesis, and various vascular diseases such as atherosclerosis. One of the key advantages of using HUVECs in research is their ability to closely mimic the vasculature and study endothelial cell dynamics in vitro. This makes them an important tool in various research fields, including inflammation, oxidative stress, infection response, and normal and tumor-associated angiogenesis. In cancer research, HUVECs are of particular interest due to the ability of tumors to induce angiogenesis. Solid tumors require a healthy supply of oxygen- and nutrient-rich blood to grow and survive, and angiogenic processes direct the formation of new blood vessels, enhancing the tumor blood supply. Developing therapeutic agents that target tumor angiogenesis is an active area of research, and HUVECs play a significant role in this process. HUVECs are a primary, non-immortalized cell system that is easy to isolate and culture, making them an ideal model for studying vascular endothelium. They can be used in standardized in vitro angiogenesis assays to study normal endothelial cell behavior or evaluate how endothelial cells react to different stimuli or treatments with pro- and anti-angiogenic agents. HUVECs can also be used in tube formation assays to assess the ability of endothelial cells to form tubes. This process occurs after endothelial proliferation and migration to the site of the pro-angiogenic stimulus. To culture HUVECs, it takes about 2-4 hours to attach to the surface with 0.2% gelatin coating. Our HUVEC cells have undergone extensive testing to ensure their quality and viability. We guarantee that each vial contains at least 70% viable cells that have been tested for the presence of mycoplasma, bacteria, yeast, or other fungi. Quality control includes testing for the absence of hepatitis B, hepatitis C, and HIV-1 viruses. Our HUVEC cells are cryopreserved at the end of the primary culture phase in a medium containing 10% DMSO, with each vial containing over 0.5 x 10^6 viable cells. In conclusion, HUVECs are a widely used model system to study vascular biology in vitro.
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

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 medium and rinse the adherent cells using PBS without calcium and magnesium (3-5 ml PBS for T25, 5-10ml for T75 cell culture flasks). Add Accutase (1-2ml per T25, 2.5ml per T75 cell culture flask), the cell sheet must be covered completely. Incubate at ambient temperature for 8-10 minutes. Carefully resuspend the cells with medium (10 ml), centrifuge for 3 min at 300xg, resuspend cells in fresh medium and dispense into new flasks which 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	HUVEC, pooled 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.
Handling of proliferating cultures	One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in a 50 ml centrifuge tube. Spin down the collected medium at 300 x g for 3 minutes to collect the cells which may have detached during transit. If a cell pellet is visible, resuspend the cells in 5 ml of cell culture medium and transfer to a T25 cell culture flask. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Examine cell morphology and confluency using a microscope. Finally, incubate the flasks at 37 degrees Celsius for at least 24 hours.

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.