

HUVEC | 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 0.5×10^6 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
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Characteristics

Ethnicity	Caucasian
Morphology	Endothelial
Cell type	Primary cells

HUVEC | 300605

Growth properties Monolayer, adherent

Identifiers / Biosafety / Citation

Citation HUVEC, pooled (CLS catalog number 300605)

Biosafety level 1

Expression / Mutation

Protein expression Cyttoplasmic VWF/ Factor VIII > 95% positive by immunofluorescence. Cyttoplasmic uptake of Di-I-Ac-LDL > 95% positive by immunofluorescence. Cyttoplasmic PECAM1 > 95% positive by immunofluorescence

Viruses Negative for HIV-1, HBV, and HCV

Handling

Culture Medium Endothelial Cell Growth Medium

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 (CLS catalog number 800100) or CM-ACF (CLS catalog number 806100)

HUVEC | 300605

Handling of cryopreserved cultures

The cells come deep-frozen shipped on dry ice. Please make sure that the vial is still frozen. If immediate culturing is not intended, the cryovial must be stored below -150 degree Celsius after arrival. If immediate culturing is intended, please follow the below instructions: Quickly thaw by rapid agitation in a 37 degree Celsius water bath within 40-60 seconds. The water bath should have clean water containing an antimicrobial agent. As soon as the sample has thawed, remove the cryovial from the water bath. A small ice clump should still remain and the vial should still be cold. From now on, all operations should be carried out under aseptic conditions. Transfer the cryovial to a sterile flow cabinet and wipe with 70% alcohol. Carefully open the vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of culture medium (room temperature). Resuspend the cells carefully. Centrifuge at 300 x g for 3 min and discard the supernatant. The centrifugation step may be omitted, but in this case the remains of the freeze medium have to be removed 24 hours later. Resuspend the cells carefully in 10 ml fresh cell culture medium and transfer them into two T25 cell culture flasks. All further steps are described in the subculture section.

Handling of proliferating cultures

One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in 1 or 2 x 50 ml centrifuge tubes, respectively. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Control the cell morphology and confluence under the microscope. Incubate at 37 degree Celsius for a minimum of 24 hours. 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. Incubate at 37 degree Celsius for a minimum of 24 hours.

Quality control / Genetic profile / HLA

Sterility

Mycoplasma contamination was excluded through PCR-based and luminescence-based mycoplasma assays. Bacterial or fungal contaminations are detected through daily visual cell monitoring.