HMEC-1

304064

GENERAL INFORMATION

Description

HMEC-1 cells, or Human Microvascular Endothelial Cells-1, are an immortalized cell line derived from human dermal microvascular endothelial cells. This cell line was developed to facilitate research on the microvascular endothelial function and pathology. HMEC-1 cells are extensively used in vascular biology research due to their ability to retain many of the phenotypic and functional characteristics of primary endothelial cells.
HMEC-1 cells display typical endothelial cell markers such as CD31 (PECAM-1), von Willebrand factor, and VE-cadherin, and they can form capillary-like structures when cultured on appropriate matrices, mimicking angiogenesis in vitro. This makes them particularly valuable for studies on angiogenesis, the formation of new blood vessels from pre-existing vasculature, a critical process in both physiological and pathological conditions such as wound healing, cancer growth, and cardiovascular diseases.
These cells are also used to explore endothelial cell responses to inflammatory cytokines, the barrier function of endothelial layers, and the interaction between endothelial cells and other cell types like immune cells. HMEC-1 cells are amenable to genetic manipulation, allowing researchers to investigate the impact of specific genes on endothelial function and to model various vascular diseases.
Furthermore, HMEC-1 cells serve as a model system for studying the permeability of endothelial barriers, which is crucial in the context of drug delivery and the pathogenesis of infectious diseases where pathogens cross endothelial barriers. The cell line's versatility and ease of use continue to make it a cornerstone in studies of microvascular endothelial cell biology and pathology.

Tissue	Skin

Applications

Research studies for human dermal endothelial cells

Synonyms

- Hmec-1
- HMEC1
- CDC/EU.HMEC-1
- Human Microvascular Endothelial Cell line-1

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent
GMO status	GMO-S1

GMO status details

GMO-S1: This human microvascular endothelial cell line (HMEC-1) contains an SV40 T-Antigen construct delivered via the pSVT vector, enabling robust proliferation and immortalization. The construct is stably integrated into endothelial cells. This classification applies only within Germany and may differ elsewhere.

Biosafety level	1

CHARACTERISTICS

Morphology	Endothelial-like

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IDENTIFIERS

Citation

HMEC-1 (Cytion catalog number 304064)

NCBI TaxID	9606
Cellosaurus	CVCL_0307

EXPRESSION AND SUSCEPTIBILITY

Protein expression

Von Willebrand's factor (vWF), cell adhesion molecules ICAM-1

Viruses

Simian virus 40 (large T antigen)

HANDLING AND CULTURE

Culture medium

Alpha MEM, w: 2.0 mM stable Glutamine, w/o: Ribonucleosides, w/o: Deoxyribonucleosides, w: 1.0 mM Sodium pyruvate, w: 2.2g/L NaHCO3

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS, 10 ng/mL Epidermal Growth Factor, 1 microgram/mL Hydrocortisone, 10 mM Glutamine

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.

Thawing and culturing

Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
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.
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.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
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.
Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
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.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

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.

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.

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.

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.

DONOR

Donor age	1 month

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes

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