Product sheet

HMEC-1 Cells | 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.
Organism	Human
Tissue	Skin
Applications	Research studies for human dermal endothelial cells
Synonyms	Hmec-1, HMEC1, CDC/EU.HMEC-1, Human Microvascular Endothelial Cell line-1

Characteristics

Age	1 month
Gender	Male
Morphology	Endothelial-like
Growth properties	Adherent

Regulatory Data

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Citation	HMEC-1 (Cytion catalog number 304064)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_0307
GMO Status	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.

Biomolecular Data

Protein expression	Von Willebrand's factor (vWF), cell adhesion molecules ICAM-1
Viruses	Simian virus 40 (large T antigen)

Handling

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
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.
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.
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.

Quality Control & Molecular Analysis

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.