

HEK293-VEGF-TM Cells | 305991

General information

Description

Disclaimer: The prices displayed for cell lines are exclusively for academic/not-for-profit customers. For commercial entities the price is approximately €6,250. If you represent a commercial entity or are unsure which category applies, please [contact us](#).

HEK293-VEGF-TM cells are human embryonic kidney 293 (HEK293) cells engineered to stably express a membrane-tethered form of vascular endothelial growth factor (VEGF), commonly designed to present VEGF at the cell surface through fusion with a transmembrane domain. Unlike soluble VEGF isoforms that are secreted into the extracellular environment, VEGF-TM constructs enable localized and sustained presentation of VEGF ligands on the plasma membrane, facilitating controlled investigation of VEGF receptor interactions and cell-cell signaling mechanisms. These engineered models are useful for studying angiogenic signaling pathways mediated primarily through VEGFR1 (FLT1) and VEGFR2 (KDR), which regulate endothelial proliferation, migration, vascular permeability, and neovascularization.

HEK293-VEGF-TM cells are widely used in angiogenesis research and therapeutic development for characterization of VEGF-targeted antibodies, receptor traps, anti-angiogenic biologics, and engineered immune cell therapies. The membrane-anchored VEGF presentation enables quantitative assessment of receptor binding, ligand accessibility, antibody blockade, receptor clustering, and cell-contact-dependent signaling events. These cells are particularly valuable in flow cytometry-based binding assays, co-culture systems, reporter assays, and high-throughput screening platforms evaluating VEGF/VEGFR pathway inhibition. In addition, HEK293-VEGF-TM models can support studies examining synapse formation and target recognition by VEGF-directed CAR-T cells or bispecific antibody platforms.

Organism Human

Tissue Fetal Kidney

Disease Transformed/immortalized; non-tumorigenic (HEK293 background)

Applications Transmembrane VEGF (VEGF-TM) research; anti-VEGF antibody development; tumor angiogenesis studies; ADCC/CDC assays; flow cytometry; oncology and ophthalmology research

Characteristics

Age Fetus

Gender Female

Morphology Epithelial-like

Cell type Epithelial cells

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Growth properties Monolayer, adherent

Regulatory Data

Citation HEK293-VEGF-TM (Cytion catalog number 305991)

Biosafety level 1

NCBI_TaxID 9606

CellosaurusAccession CVCL_6G30

GMO Status GMO-S1: This HEK293 cell line contains a transmembrane VEGF (VEGF-TM) expression construct for cell-surface VEGF studies and anti-angiogenic therapy development. This classification applies only within Germany and may differ elsewhere.

Biomolecular Data

Receptors expressed VEGF-TM

Handling

Culture Medium RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO₃ (Cytion article number 820700a)

Supplements Supplement the medium with 10% FBS, 1 mM sodium pyruvate, 10 mM HEPES, 1% NEAA. Add Geneticin (G418-Sulfat) to achieve a final concentration of 1 mg/mL.

Dissociation Reagent Trypsin-EDTA

Doubling time approx. 24-36 hours

Subculturing For routine adherent cell culture: Aspirate the old culture medium from the adherent cells, and wash them with PBS to remove any remaining medium. After aspirating the PBS, add the appropriate volume of Trypsin/EDTA solution based on the culture vessel size (e.g., 1 ml for a T25 flask, 3 ml for a T75 flask) and incubate at room temperature or 37°C until the cells detach (5-10 minutes). Monitor detachment under a microscope, and gently tap the vessel if necessary to release the cells. Once detached, add complete medium to inactivate the Trypsin/EDTA, gently resuspend the cells, and transfer an aliquot of the cell suspension into a new culture vessel containing fresh medium. Place the vessel in an incubator set to 37°C with 5% CO₂, and change the medium every 2-3 days.

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Split ratio 1 to 5

Seeding density 2 to 4 x 10⁴ cells/cm²

Fluid renewal 2 to 3 times per week

Post-Thaw Recovery

After thawing, split the cells at a ratio of 1:2 to 1:3 in T25 flasks and allow the cells to recover from the freezing process and to adhere for at least 24 hours.

For best attachment and viability after thawing the cells, we recommend using Collagen-coated flasks or plates for the initial seeding after cryo-recovery. Collagen coating is not required for subsequent routine culture of the cells.

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.

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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 $300 \times g$ 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

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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.