ACTIVE BIOSCIENCE
PROTEINS · CELLS · ANTIBODIES

Human $VEGF_{189}$

Synonyms: Vascular Endothelial Growth Factor A, VEGFA, VPF, VEGF, MVCD1.

PLEASE NOTE: ALWAYS CENTRIFUGE VIAL BEFORE OPENING

Size	Order #	Lot #	Expiry Date
5 µg	2195.950.005		
20 µg	2195.950.020		
100 µg	2195.950.100		

Please enquire for bulk quantities and other vial sizes

Description

Recombinant Human Vascular Endothelial Growth Factor $VEGF_{189}$ is a 21 kDa protein consisting of 189 amino acid residues, produced as a homodimer. VEGF is a polypeptide growth factor and a member of the platelet-derived growth factor family. It is a specific mitogen for vascular endothelial cells and a strong angiogenic factor in vivo. Two high-affinity tyrosine kinase receptors for $VEGF_{165}$ have been identified, VEGFR-1 (FLT-1), and VEGFR-2 (KDR). Consistent with the endothelial cell-specific action of $VEGF_{165}$, expression of both receptor genes has been found predominantly but not exclusively on endothelial cells. Expression of VEGFR-1 was also found on human monocytes, neutrophils (PMNs), bovine brain pericytes and villous and extravillous trophoblasts. In addition to its action as a mitogen it is a potent vascular permeability factor (VPF) in vivo. $VEGF_{165}$ is also a chemoattractant molecule for monocytes and endothelial cells. 5 different proteins are generated by differential splicing: $VEGF_{121}$, $VEGF_{145}$, $VEGF_{165}$, $VEGF_{189}$ and $VEGF_{206}$. The most abundant form is $VEGF_{165}$. Whereas $VEGF_{121}$ and $VEGF_{165}$ are secreted proteins, $VEGF_{145}$, $VEGF_{189}$ and $VEGF_{206}$ are strongly cell-associated. The isoforms $VEGF_{145}$, $VEGF_{165}$ and $VEGF_{189}$ bind to heparin with high affinity. $VEGF_{165}$ is apparently a homodimer, but preparations of $VEGF_{165}$ show some heterogeneity on SDS gels, depending on the secretion of different glycosylation patterns. All dimeric forms have similar biological activities, but their bioavailability is very different. There is good evidence that there also exist heterodimeric molecules between the different isoforms and that different cells and tissues express different VEGF isoforms. The other members of this increasing growth factor family are VEGF-B, -C, -D and -E. Another member is the Placenta growth factor PlGF.

- **Biological activity** ≥ $1x10^5$ units/mg
- **Source** *E. coli*
- **Purity** ≥ 98 % (SDS-PAGE, silver stained)
- **Endotoxin level** ≤ 0.1 ng/µg (≤ 0.1EU/µg)
- **Stabilizer** None
- **Buffer** Acetic acid (50mM)
- **Physical state** Sterile filtered, lyophilized

Biological Activity

An ED_{50} of 2-10ng/ml has been measured in a cell proliferation assay using primary human umbilical vein endothelial cells (HUVECs) and primary human dermal lypmphatic endothelial cells (HDLECs). This corresponds to a specific activity of ≥ $1x10^5$ units/mg.

Reconstitution

We recommend a quick spin followed by reconstitution in water to a concentration of at least 50µg/ml, which could then be further diluted. **Do not vortex!** For long term storage we recommend to further dilute into aqueous solutions containing a carrier protein (e.g. 0.1% HSA ultra pure 2835.958.188) and store in working aliquots at -20°C to -80°C. Working aliquots should be at the highest possible concentration.

Stability

The lyophilized Protein is stable at room temperature for up to 3 weeks and at least until the lot specific expiry date if it is stored desiccated below -20°C. Upon reconstitution Human $VEGF_{189}$ can be stored at 4°C for 2-7 days and for future use below -18°C. For long term storage it is recommended to add a carrier protein (e.g. 0.1% HSA ultra pure 2835.958.188). **Please avoid repeated freeze-thaw cycles.**

*The Buffer may vary depending on the Lot #. Please contact our technical support if you have specific requirements.

Amino Acid Sequence

APMAEGGGQN HHEVVKFMDV YQRSYCHPIE TLVDIFQEYP DEIEYIFKPS CVPLMRCGGC CNDEGLECVP
TEESNITMQI MRIKPHQGQH IGEMSFLQHN KCECRPKKDR ARQEKKSVRG KGKGQKRKRK KSRYKSWSVP
CGPCSERRKH LFVQDPQTCK CSCKNTDSRC KARQLELNER TCRCDKPRR

SDS-PAGE and Biological Activity of Human $VEGF_{189}$

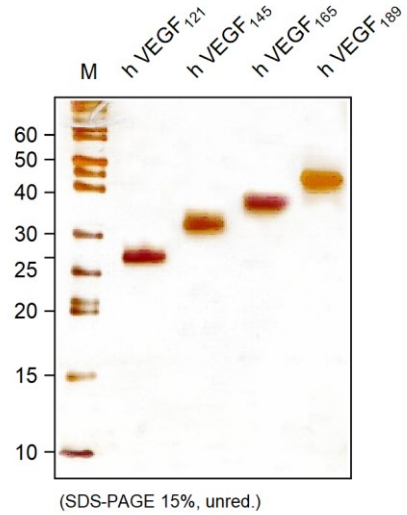

***Fig. 1**: SDS-PAGE analysis of recombinant human VEGF-A isoforms produced in E. coli. Samples were loaded under non-reducing conditions in 15% SDS-polyacrylamide gel and visualized with Silver stain.*

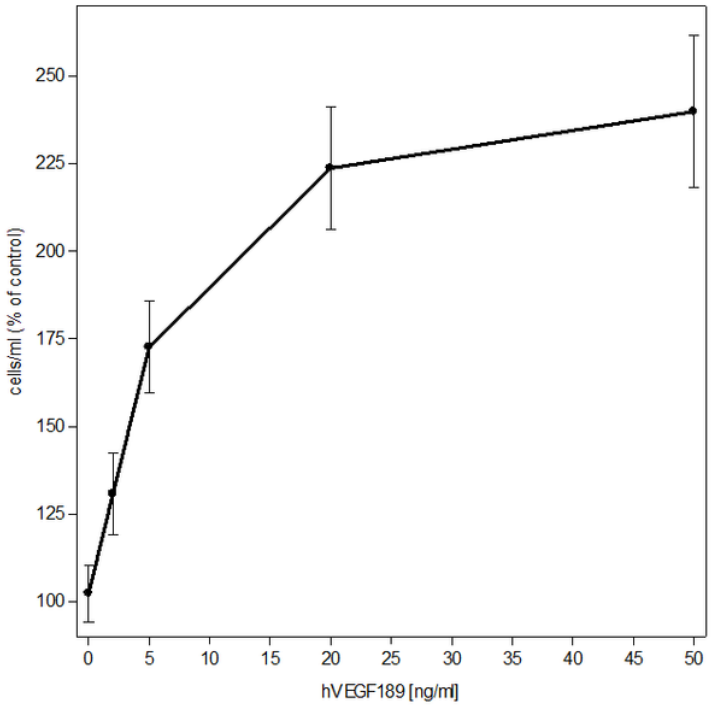

***Fig. 2**: $VEGF_{189}$-induced proliferation of primary human dermal lymphatic endothelial cells (HDLEC). HDLECs were stimulated with increasing amounts of recombinant human $VEGF_{189}$.*

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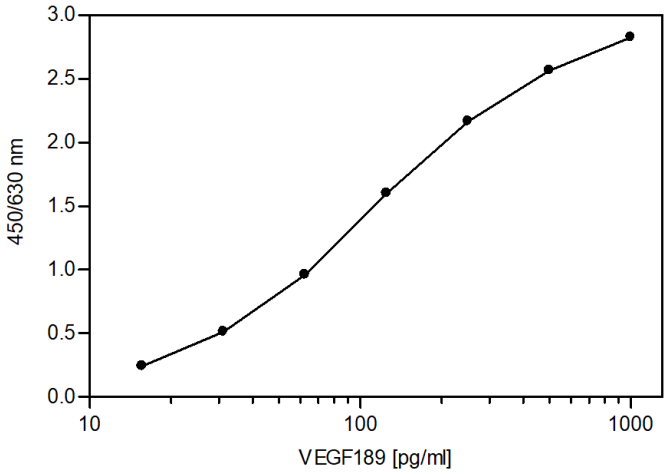

***Fig. 3**: VEGF-A Sandwich-ELISA using VEGF189 (order number: 2195.950.xyz) as standard. Mouse anti-human VEGF-A (order number: 2195.650.100) was used as capture antibody, Biotinylated mouse anti-human VEGF-A (order number: 2196.650.050) was used for detection.*

Usage: For research use only. Not for use in diagnostic or therapeutic procedures. Not for human use.

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