Recombinant Human Vascular Endothelial Growth Factor$_{165}$

20200305BB

FOR RESEARCH ONLY! NOT FOR HUMAN USE!

Cat.-no:	**300-036**
Size:	20 µg
Lot. No.:	According to product label
Country of origin:	Germany

Scientific Background

Gene:	*vegf*
Synonyms:	VEGF-A, VPF

Human Vascular Endothelial Growth Factor VEGF$_{165}$, a 23kDa protein consisting of 165 amino acid residues, is 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 extra villous trophoblast. In addition to its action as a mitogen it is a potent vascular permeability factor (VPF) in vivo. VEGF$_{165}$ is also a chemo attractant 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 homo-dimer, 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 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.

References

1. Breier et al., Dev 114:521, 1992
2. Fiebig et al., Eur J Biochem 211:19, 1993
3. Flamme et al., Dev Biol 162:699, 1995
4. Kremer at al., Cancer Res 57:3852, 1997

Sequence

APMAEGGGQNHHEVVKFMDVYQRSYCHPIETLVDIFQEYPDEIEYIFKPSCV
PLMRCGGCCNDEGLECVPTEESNITMQIMRIKPHQGQHIGEMSFLQHNKCEC
RPKKDRARQENPCGPCSERRKHLFVQDPQTCKCSCKNTDSRCKARQLELNER
TCRCDKPRR

Database References

Protein RefSeq:	NP 001165097
Uniprot ID:	P15692-4
mRNA RefSeq:	NM 001171626

Product Specifications

Expressed in	Insect cells
Purity	> 95% by SDS-PAGE
Buffer	50 mM acetic acid
Stabilizer	None
Formulation	lyophilized
Length (aa):	165
MW:	45 kDa
Result by N-terminal sequencing	APMAEGG

Stability: Lyophilized samples are stable for greater than six months at -20°C to -70°C. Reconstituted VEGF$_{165}$ should be stored in working aliquots at -20°C.

Reconstitution: Centrifuge the vial prior to opening! The lyophilized VEGF$_{165}$ should be reconstituted in 50 mM acetic acid to a concentration not lower than 50 µg/ml. For long term storage we recommend to add at least 0.1% human or bovine serum albumin.

AVOID REPEATED FREEZE AND THAW CYCLES!

Biological Activity: The ED$_{50}$ for stimulation of cell proliferation by human umbilical vein endothelial cells for VEGF$_{165}$ has been determined to be in the range of 1-4 ng/ml.

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Handling/Application

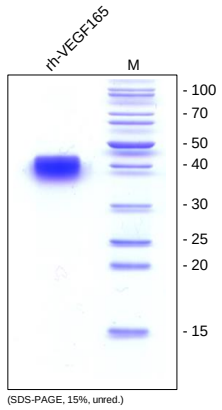

Fig. 1: SDS-PAGE analysis of recombinant human VEGF$_{165}$. Sample was loaded in 15% SDS-polyacrylamide gel under non-reducing condition and stained with Coomassie blue.

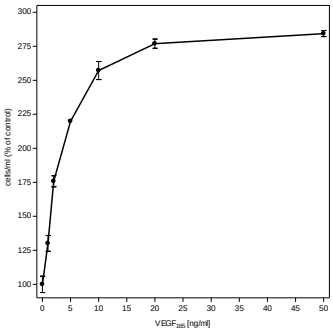

Fig. 2: VEGF$_{165}$-induced proliferation of HUVE cells. HUVECs were stimulated with increasing amounts of human VEGF$_{165}$.

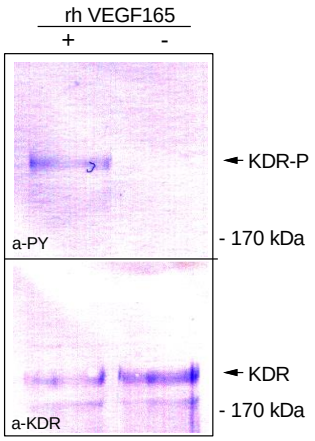

Fig. 3: Confluent PAE/KDR cells were stimulated with 50ng/ml human VEGF$_{165}$ for 10 min at 37°C. Cells were lysed and an IP was performed using a mouse anti-human KDR antibody (**Cat# 101-M32**). WB was performed with a mouse anti-human KDR antibody (**Cat# 101-M34**) and an anti-Phosphotyrosine antibody.

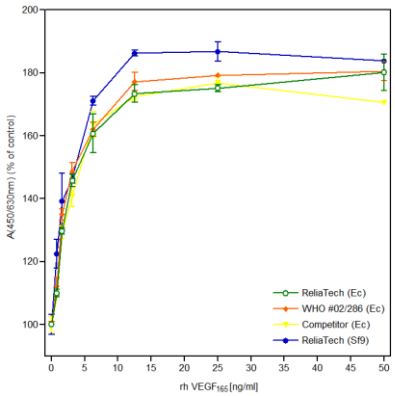

Fig. 4: Proliferation assay with primary human dermal lymphatic endothelial cells (HDLEC). The cells were stimulated using recombinant human VEGF$_{165}$ and the WHO standard #02/286. Values are the means (±SD) of triplicate determinations and expressed as percentage of control.

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