Recombinant Rat Vascular Endothelial Growth Factor$_{164}$

FOR RESEARCH ONLY! NOT FOR HUMAN USE!

Cat.-no:	**R20-067S**
Size:	2 µg
Lot. No.:	According to product label
Country of origin:	Germany

Scientific Background

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

Rat Vascular Endothelial Growth Factor$_{164}$ (VEGF$_{164}$), a 19.23 kDa protein consisting of 164 amino acid residues, is produced as a homodimer. VEGF$_{164}$ 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$_{164}$ have been identified, VEGFR-1 (FLT-1), and VEGFR-2 (Flk-1). Consistent with the endothelial cell-specific action of VEGF$_{120}$, 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 and is also a chemo attractant for monocytes and endothelial cells. At least four different proteins are generated by differential splicing of the mouse VEGF gene: VEGF$_{120}$, VEGF$_{144}$, VEGF$_{164}$ and VEGF$_{188}$. The most abundant form is VEGF$_{164}$. Whereas VEGF$_{120}$, VEGF$_{144}$ and VEGF$_{164}$ are secreted proteins, VEGF$_{188}$ is strongly cell-associated. In addition, the isoforms VEGF$_{164}$ and VEGF$_{188}$ bind to heparin with high affinity. All dimeric forms possess similar biological activities. A related protein of VEGF is placenta growth factor (PlGF) with about 53% homology and VEGF-B with similar biological activities.
The full ORF of native rat VEGF$_{164}$ (Ala27-Arg190) was cloned from total RNA of rat sinusoidal endothelial cells using standard protocols.

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

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APTTEGEQKSHEVIKFMDVYQRSYCRPIETLVDIFQEYPDEIEYIFKPSCVP
LMRCAGCCNDEALECVPTSESNITMQIMRIKPHQSQHIGEMSFLQHSRCECR
PKKDRTKPENHCEPCSERRKHLFVQDPQTCKCSCKNTDSRCKARQLELNERT
CRCDKPRR
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Database references

Protein RefSeq:	NP_114024.2.
Uniprot ID:	P16612
mRNA RefSeq:	NM_031836.2

Product Specifications

Expressed in	E.coli
Purity	>95%, by SDS-PAGE and silver stain
Buffer	PBS
Stabilizer	None
Formulation	freeze dried
Length (aa):	164
MW:	19,23
Result by N-terminal sequencing	APTTEGEQKAH

Stability: Lyophilized samples are stable for greater than six months at –20°C to –70°C. Reconstituted VEGF$_{164}$ should be stored in working aliquots at -20°C.

Reconstitution: The lyophilized VEGF$_{164}$ should be reconstituted in ddH_2O to a concentration not lower than 50µg/ml.

AVOID REPEATED FREEZE AND THAW CYCLES!

Biological Activity: Determined by the dose-dependent stimulation of the proliferation of human umbilical vein endothelial cells (HUVEC) using a concentration range of 2-10 ng/ml.

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Handling/Applications

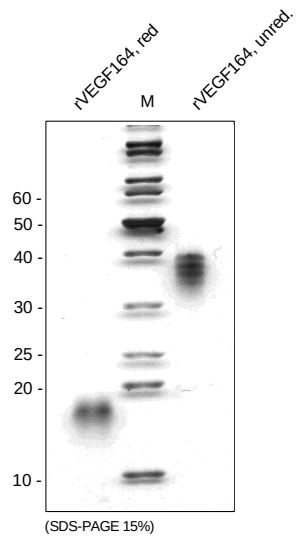

Fig. 1: SDS-PAGE analysis of recombinant rat VEGF$_{164}$. Sample was loaded in 15% SDS-polyacrylamide gel under non-reducing conditions and stained with Silver stain.

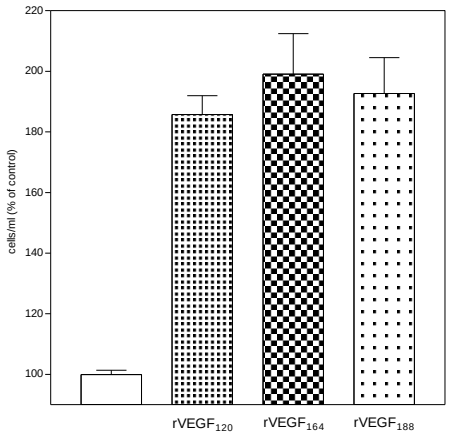

Fig. 2: Stimulation of cell proliferation in primary human umbilical vein endothelial cells (HUVEC) by recombinant rat VEGF-A isoforms. Values are the means (±SD) of triplicate determinations and expressed as percentage of control.

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