Miltenyi Biotec

Human VEGF (165) IS
research grade

Contents

1. Description

Products Human VEGF (165) IS, research grade.

Recombinant human vascular endothelial growth factor (165) IS (improved sequence).

Content in µg	Order no.
10	130-109-383
25	130-109-384

Biological activity The ED_{50} is ≤3.3 ng/mL corresponding to an activity of $\geq 3\times10^5$ U/mg.

▲ **Note:** The ED_{50} was determined by dose-dependent stimulation of the proliferation of human umbilical vein endothelial cells according to Conn, G. *et al.*[1] The proliferation assay was calibrated with the international standard for human VEGF165 (NIBSC code 02/286) provided by the WHO/National Institute for Biological Standards and Control.

Primary structure Two identical, non-glycosylated polypeptide chains (comprising amino acid residues 31 to 191) with an Asn to Gln substitution at position 75.

Molecular mass 37.6 kDa (dimer).

Source Produced in *Pichia pastoris*.

Product format Lyophilized from a filtered (0.2 µm) buffer solution.

Stabilizer Mannitol and trehalose.

Purity >95% as determined by SDS-PAGE analysis.

Endotoxin level Low endotoxin (<1.0 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.

Storage Lyophilized Human VEGF (165) IS, research grade should be stored at –20 °C. The expiration date is indicated on the vial label. Upon reconstitution aliquots should be stored at –20 °C or below. Avoid repeated freeze-thaw cycles.

Reconstitution It is recommended to reconstitute lyophilized Human VEGF (165) IS, research grade with deionized sterile-filtered water to a final concentration of 0.1–1.0 mg/mL in a minimal volume of 100 µL. Further dilutions should be prepared with 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) in phosphate-buffered saline.

1.1 Background information

Vascular endothelial growth factor (VEGF), a disulfide-linked homodimer also known as VEGF-A, belongs to the platelet-derived growth factor superfamily. VEGF is secreted by vascular smooth muscle cells upon hypoxic conditions and promotes angiogenesis and vasculogenesis, vascular permeability, and inhibition of apoptosis, through the binding to two cell surface receptors, VEGFR1 (Flt-1) and VEGFR2 (KDR/Flk-1), and other co-receptors, which are expressed mainly on endothelial cells and immune cells. VEGFR2 mediates almost all observed endothelial responses to VEGF, while neuropilin-1 acts as co-receptor for the VEGF 165 isoform and enhances its binding to VEGFR2 and its biological activity. The VEGF/VEGFR system supports initiation of inflammation, inducing migration of monocytes and macrophages, but also acts on neurons and kidney epithelial cells. Moreover, VEGF contributes to tumor growth and metastasis formation, and is crucial during embryonic development and wound healing. Alteration in VEGF/VEGFR pathways have been associated with diseases, such as cancer, age-related macular degeneration, preeclampsia, rheumatoid arthritis, and neuronal disorders, such as amyotrophic lateral sclerosis. Several isoforms are generated as a result of alternative splicing, including the soluble isoforms VEGF 121 aa and VEGF 165 aa in human, and a VEGF 164 aa isoform in mouse.

1.2 Applications

Human VEGF (165) IS may be used for a variety of applications, including:

- Proliferation of endothelial cells.
- Promotion of endothelial cell migration.
- Chemo-attractant function, inducing migration of monocytes and osteoblasts.
- Increasing the release of von Willebrand factor from endothelial cells and metallo-proteinases activity.

Optimal concentration for a specific application should be determined by a dose-response experiment.

2. References

1. Conn, G. *et al.* (1990) Purification of a glycoprotein vascular endothelial cell mitogen from a rat glioma-derived cell line. Proc. Natl. Acad. Sci. U.S.A. 87 (4): 1323–1327.

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