



Product Information

MONOCLONAL ANTI-VEGF RECEPTOR-2 (KDR)
CLONE KDR-2 or 260.4
BIOTIN CONJUGATE
Purified Mouse Immunoglobulin

Product Number **B 0555**

Product Description

Biotin Conjugated Monoclonal Anti-VEGF Receptor-2 (KDR) (mouse IgG1 isotype) is derived from the KDR-2 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a BALB/c mouse immunized with a purified recombinant human extracellular VEGF receptor-2 (KDR).¹ The isotype is determined using Sigma ImmunoType™ Kit (Product Code ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Product Code ISO-2). The antibody is purified from ascites fluid, and conjugated with Sulfo-NHS-LC-Biotin. The conjugate contains no detectable free biotin.

Biotin Conjugated Monoclonal Anti-VEGF Receptor-2 (KDR) reacts specifically with human VEGF receptor.^{1,2} It does not recognize Flt1, Flt4 or platelet-derived growth factor receptor β (PDGF-R1).¹ The product may be used for ELISA,¹ immunoblotting,¹ flow cytometry² and immunohistochemistry (formaldehyde-fixed frozen sections).

Vascular endothelial growth factor (VEGF), also called vasculotropin (VAS)³ and vascular permeability factor (VPF),⁴ is a member of a family of endothelial cell mitogens and angiogenic factors. VEGF is a homodimeric heparin-binding glycoprotein, which specifically stimulates the proliferation of endothelial cells isolated from both small and large vessels. These include endothelial cells from adrenal cortex, cerebral cortex, fetal and adult aorta and human umbilical vein.⁵ The mitogenic activity of VEGF appears to be stimulated by specific VEGF receptors (160-200 kDa) which can be found on the surface of various endothelial cells.⁶ VEGF binds to two structurally similar receptor tyrosine kinases; Flt1⁷ (fms-like tyrosine kinase 1, also known as VEGF Receptor-1 (VEGF-R1), and KDR⁸ (kinase-insert domain containing receptor, also known as VEGF-R2).⁹ The homologous gene for the human KDR gene is mouse Flk1 (fetal liver kinase 1) and rat TKrc. Both receptors are members of a superfamily of receptor tyrosine kinases (RTKs) which include PDGF receptor, c-fms, M-CSF receptor and c-kit - the receptor for stem-cell factor. The

KDR gene has been mapped to human chromosome 4q11-q12, which is the same locus of PDGF receptor and c-kit.¹⁰ The extracellular domains of KDR/Flk1 and Flt1 (approx. 90 kDa), have seven immunoglobulin-like domains and belong to the class III RTKs. This family includes also Flt4, which shares a high homology with the two VEGF receptors. Studies using KDR and Flt1 stably transfected endothelial cell lines have shown that these two receptors exhibit different affinities to VEGF and mediate different responses. KDR expressing cells show striking changes in cell morphology, actin reorganization and membrane ruffling, chemotaxis and mitogenicity in response to VEGF, while Flt1 expressing cells lack such responses. Both KDR and Flt1 are phosphorylated in response to VEGF, however KDR much more efficiently.¹¹ KDR/Flk1 does not respond to placental growth factor (PIGF), a VEGF related growth factor, while Flt1 binds PIGF specifically. The expression pattern of the two receptors is somewhat different; Flt1 is predominately expressed in human placenta and human vascular endothelial cells, while KDR is more widely expressed in all vessel-derived endothelial cells but low in human and fetal bovine placenta.¹² Both VEGF receptors (KDR and Flt1) are upregulated in human fetal and in adult kidney.¹³ It has been suggested that in human postnatal hematopoietic tissues, 0.1% to 0.5% of CD34⁺ cells express VEGF-R2/KDR; pluripotent hematopoietic stem cells (HSCs) were found to be restricted to the CD34⁺KDR⁺ cell fraction, while lineage-committed hematopoietic progenitor cells (HPCs) were found in the CD34⁺KDR⁻ subset.² Antibodies that react specifically with VEGF receptors are useful for the study of the specific differential tissue expression and intracellular localization of the receptor in normal and neoplastic tissue.

Reagents

Biotin Conjugated Monoclonal Anti-VEGF Receptor-2 (KDR) is supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 1% bovine serum albumin and 15 mM sodium azide.

Precautions and Disclaimer

Due to the sodium azide content a material safety sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution.

Consult the MSDS for information regarding hazardous and safe handling practices.

Storage/Stability

Store at 2-8 °C for up to one month.

For extended storage, freeze in working aliquots. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

Product Profile

A minimum working dilution of 1:1,000 is determined by immunoblotting using a culture supernatant of insect

cells infected with a baculovirus expressing recombinant extracellular human KDR receptor.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working dilution by titration test

References

1. Roeckl, W., et al., *Exp. Cell Res.*, **241**, 161 (1998).
 2. Ziegler, B. L., et al., *Science*, **285**, 1553 (1999).
 3. Plouet, J., et al., *EMBO J.*, **8**, 3801 (1989).
 4. Keck, P. J., et al., *Science*, **246**, 1309 (1989).
 5. Ferrara, N., et al., *J. Cell Biochem.*, **47**, 211 (1991).
 6. Vaisman, N., et al., *J. Biol. Chem.*, **265**, 19461 (1990).
 7. de Vries, C., et al., *Science*, **255**, 989 (1992).
 8. Terman, B. I., et al., *Biochem. Biophys. Res. Commun.*, **187**, 1579 (1992).
 9. Hanahan, D., *Science*, **277**, 48 (1997).
 10. Sait, S. N., et al., *Cytogenet. Cell. Genet.*, **70**, 145 (1995).
 11. Waltenberger, J., et al., *J. Biol. Chem.*, **269**, 26988 (1994).
 12. Barleon, B., et al., *J. Cell. Biochem.*, **54**, 56 (1994).
 13. Simon, M., et al., *J. Am. Soc. Nephrol.*, **9**, 1032 (1998).
- lpg 10/02

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.