3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Product Information

Anti-Fibroblast Growth Factor Receptor-3, Extracellular
produced in rabbit, affinity isolated antibody

Catalog Number **F3922**

Synonym: Anti-FGFR-3

Product Description
Anti-Fibroblast Growth Factor Receptor-3, Extracellular is produced in rabbit using as immunogen a synthetic peptide Ala-Glu-Glu-Glu-Leu-Val-Glu-Ala-Asp-Glu-Ala-Gly-Ser-Val-Lys conjugated with glutaraldehyde to KLH. The peptide corresponds to amino acid residues 359-372 of the extracellular region of human FGFR-3 with a C-terminal added lysine. The product is affinity purified on an immunizing peptide-agarose column.

Anti-FGFR-3, Extracellular, reacts specifically with FGFR-3. By immunoblotting, the antibody detects bands at 110 kDa and 120 kDa using a whole cell lysate of 293T cells transfected with the FGFR-3 full length gene. Staining of the 110 kDa-120 kDa bands is specifically inhibited with the FGFR-3 immunizing peptide. No reaction with human FGFR-1 and FGFR-2 is detected.

Anti-FGFR-3, Extracellular, may be used for immunoblotting and immunohistochemistry. The epitope(s) recognized by the antibody is resistant to routine formalin-fixation and paraffin-embedding.

Fibroblast growth factors (FGFs) are members of a large family of structurally related polypeptides (MW 17-38 kDa) that are potent physiological regulators of growth and differentiation for a wide variety of cells of mesodermal, ectodermal and endodermal origin.[1,2,3,4] FGFs are substantially involved in normal development, wound healing and repair, angiogenesis, a variety of neurotrophic activities, and in hematopoiesis as well as in tissue remodeling and maintenance. They have also been implicated in pathological conditions such as tumorigenesis and metastasis. The FGF family consists of at least seventeen members designated FGF-1 through FGF-17.[5]

To date, four genes encoding for high affinity cell surface FGF receptors (FGFRs) have been identified: FGFR-1 [flg-1(fms-like gene 1)]; FGFR-2 [bek (bacterial expressed kinase gene product)]; FGFR-3 (cek-2) and FGFR-4. Multiple additional variants (isoforms) arising by alternative splicing have been reported.[3,6,7,8]

Soluble, secreted or possibly cleaved forms of FGFR-1 and FGFR-2 have also been found in body fluids[9] or were artificially constructed.[10] An example is a soluble FGF-binding protein containing the extracellular region of FGFR-3 and the secreted form of placental alkaline phosphatase (FRAP-3). FGFRs are members of the tyrosine kinase family of growth factor receptors. They are glycosylated 110-150 kDa proteins consisting of an extracellular domain, a single transmembrane region and a cytoplasmic split tyrosine kinase domain, which is activated following ligand binding and receptor dimerization. The extracellular, ligand binding, region is constructed with either two (β type) or typically three (α type) immunoglobulin (Ig)-like domains, and an eight amino acid 'acidic box'. The ligand binding site of all FGFRs is confined to the extracellular Ig-like domains 2 and 3.[11] FGFRs exhibit overlapping recognition and redundant specificity. One receptor type may bind several of the FGFs with a similar affinity. Also, one FGF type may bind similarly to several distinct receptors. This accounts for the rather identical effects of different FGF ligands on common cell types. FGFs binding to cellular FGFRs depend on, or is markedly facilitated by, the low-affinity interaction of FGFs with the polysaccharide component of cell surface or extracellular matrix heparan sulfate proteoglycans (HSPG).[12] For example, Perlecan, a basement membrane HSPG, promotes high affinity binding of FGF2 *in vitro* and angiogenesis *in vivo*.[13] Signal transduction by FGFRs requires dimerization or oligomerization and autophosphorylation of the receptors through their tyrosine kinase domain.

Subsequent association with cytoplasmic signalling molecules leads to DNA synthesis or differentiation. The signalling and biological responses elicited by distinct FGFRs substantially differ and are dictated by the intracellular domain.[14,15]

FGFR-3 is widely expressed in many fetal and adult human and animal tissues. The FGFR-3 expression profile largely correlates with its tissue specific expression at the mRNA level.[16] It is considered the only FGFR expressed in the organ of Corti of the rat cochlea.[17] Tissue cultured cells (such as COS-7) transfected with the full length FGFR-3 cDNA display the expected membrane localization of the receptor. Interestingly, nuclear localization (nucleoli excluded) of FGFR-3 attributable to a 110 kDa splice variant, has been reported for normal and breast cancer cells.[18] Deletions of chromosome 4p encompassing the FGFR-3 gene cause the Wolf-Hirshhorn syndrome (growth failure, mental retardation, cardiac and bone malformations). Achondroplasia is an inherited disorder in which growth abnormality of bone or cartilage lead to skeletal maldevelopment and dwarfism. It is associated with recurrent mutations of a single amino acid in the transmembrane domain of the FGFR-3 protein.[19]

Reagents
Supplied as a solution in 10 mM sodium phosphate buffered saline, pH 7.4, containing 1% bovine serum albumin and 15 mM sodium azide as preservative.

Antibody concentration: ~1 mg/ml.

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability
For continuous use, store at 2-8 °C for up to one month. For extended storage freeze in working aliquots. Repeated freezing and thawing, or storage in "frost-free" freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

Product Profile
Immunoblotting: a working dilution of 1:500 is recommended using an extract of 293T cells transfected with the human FGFR-3 full length gene.

Indirect immunoperoxidase staining: a working dilution of 1:1,000 is recommended using protease-digested, formalin-fixed, paraffin-embedded human and animal tissue sections.

References

1. Burgess, W.H. and Maciag, T., *Ann. Rev. Biochem*., **58**, 575 (1989).
2. Klagsburn, M., *Prog. Growth Factor Res*., **1**, 207 (1989).
3. Partenen, J., et al., *Prog. Growth Factor Res*., **4**, 69 (1992).
4. Baird, A., et al., *Curr. Opin. Neurobiol*., **4**, 78 (1994).
5. Hoshikawa, M., et al., *Bioch. Bioph. Res. Comm*., **244**, 187 (1998).
6. Lee, P. L., et al., *Science*, **245**, 57 (1989).
7. Givol, D. and Yayon, A., *FASEB. J*., **6**, 3362 (1992).
8. Fernig, D. and Gallagher, J., *Prog. Growth Factor Res*., **5**, 353 (1994).
9. Hanneken, A., et al., *Proc. Natl. Acad. Sci. USA*, **91**, 9170 (1994).
10. Ornitz, D.M., et al., *Mol. Cell Biol*., **12**, 240 (1992).
11. Zimmer, Y., et al., *J. Biol. Chem*., **268**, 7899 (1993).
12. Yayon, A., et al., *Cell*., **64**, 841, (1991).
13. Aviezer, D., et al., *Cell*, **79**, 1005 (1994).
14. Wang, J.K., et al., *Mol. Cell Biol*., **14**, 181 (1994).
15. Friesel, R.E. and Maciag, T., *FASEB J*., **9**, 919 (1995).
16. Hughes, S. E., et al., J. Histochem. Cytochem., **45**, 1005 (1997).
17. Pirvola, V., et al., *Proc. Natl. Acad. Sci. USA*., **92**, 9269 (1995).
18. Johnston, C. L., et al., *J. Biol. Chem*., **270**, 30643 (1995).
19. Rousseau, F., et al., *Nature*, **371**, 252 (1994).

MG,KAA,PHC 09/08-1