

Product Information

MONOCLONAL ANTI-NERVE GROWTH FACTOR RECEPTOR (NGFR p75) CLONE ME20.4 Mouse Ascites Fluid

Product Number **N 5408**

Product Description

Monoclonal Anti-Nerve Growth Factor Receptor (NGFR p75) (mouse IgG1 isotype) is derived from the ME20.4 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a BALB/c mouse immunized with a human melanoma cell line WM245.¹ 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).

Monoclonal Anti-Nerve Growth Factor Receptor (NGFR p75) recognizes the low affinity NGFR p75 of human origin (75 kDa), also known as gp75^{NGFR}, p75^{NGFR} and p75^{NTR}.¹ The epitope recognized by the antibody is located within the third or fourth cysteine-rich repeats of the NGFR molecule.^{2,3} Cross-reactivity has been observed with human^{1-7,9-13}, monkey (marmoset)⁸, pig, cat⁸ and raccoon⁸, but not with rat^{1,3}, chicken^{1,3} or mouse³ NGFR.

Monoclonal Anti-Nerve Growth Factor Receptor (NGFR p75) may be used for ELISA³, immunoprecipitation^{1,2,4,5}, immunoblotting³, immunohistochemistry^{1,6-12} (acetone^{1,6}-, formalin⁶-, Bouin's solution-fixed⁷, paraformaldehyde-perfused⁸ or unfixed¹⁰ frozen sections^{1,6-10}, Bouin's solution-¹ and formalin-fixed^{1,6} paraffin-embedded sections^{1,6}), immunocytochemistry^{1,6} (acetone-⁶ or formalin-fixed⁶, Bouin's solution¹- or formalin-fixed¹ paraffin-embedded), electron- microscopy^{6,10,13}, RIA (Kd of 7×10^{-10} M)¹, flow cytometry¹, inhibition of binding of NGF to the receptor¹, rosette assay², and as a cholinergic immunotoxin.^{8,9}

Neurotrophic factors^{14,15} control the survival, differentiation and maintenance of neurons in the peripheral and central nervous systems, and of other neural crest-derived cell types. Developing sympathetic neurons are absolutely dependent

upon nerve growth factor (NGF) during the period of target competition *in vivo*. During this neonatal development window, NGF is believed to bind to its cognate receptors on the terminals of sympathetic neurons and to regulate their level of target innervation by two primary mechanisms. First, NGF stimulates terminal growth of sympathetic neurons thereby regulating the level of target innervation. Second, NGF, in conjugation with other neurotrophins, serves as discriminator allowing the elimination of neurons that have failed to sequester adequate target territory. Neurotrophic factors, like all polypeptide hormones, deliver their message to the cell interior via interaction with cell surface receptors. They interact with multicomponent receptors consisting of several distinct protein subunits. NGF binds to two different receptors; the low affinity surface receptor p75 neurotrophin receptor (also known as NGFR p75, p75^{NGFR}, p75^{NTR}) and the receptor tyrosine kinase TrkA, each with distinct signaling capabilities.¹⁴ Although multimeric receptor complexes and functional interactions between both receptors have been observed, it is clear that NGF can bind to and elicit biological actions through each of these two receptors independently.¹⁴ Other neurotrophins (GDNF NT-3 and NT-4) are able to bind to NGFR p75 with similar affinities. However, the receptor is in fact able to distinguish among the different neurotrophins. Thus, for instance, NGF but not BDNF or NT-3, activates a downstream signaling pathway through the receptor in Schwann cells and oligodendrocytes.¹⁴ The human NGFR p75 has a hydrophobic signal sequence, a single N-linked glycosylation site, four cysteine-rich repeat units of approximately 40 amino acids in the extracellular domain, a serine- and threonine-rich region which might be O-linked glycosylated, a single transmembrane domain, and a 155-amino acid cytoplasmic domain.¹⁵ The extracellular domain of NGFR p75 has homology to the extracellular domains of B-lymphocyte activation molecule Bp50

and tumor necrosis factor receptor.³ It appears that NGFR p75 enhances the NGF binding affinity of the proto-oncogene product p140^{trk} and also may modulate the kinase activity of p140^{trk} and play a role in signal transduction.³ In addition, like other members of this family of receptors, NGFR p75 signals on its own and mediates apoptosis in certain cellular contexts. NGFR p75 contains a "death domain" motif, which has been implicated in binding or activating death effector molecules. Specifically, neurotrophin binding to NGFR p75 stimulates generation of ceramide, activation and translocation of NF- κ B to the nucleus, and enhancement of Jun kinase (JNK) activity. NGF and NGFR p75 have been the subject of extensive studies. Antibodies reacting specifically with NGFR p75 are useful tools in the detection and characterization of NGFR p75, to enhance our understanding of a wide range of phenomena in the development, plasticity and repair of the nervous system.

Reagents

The product is supplied as ascites fluid with 15 mM sodium azide as a preservative.

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 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 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 indirect immunoperoxidase staining of trypsin-digested, formalin-fixed, paraffin-embedded sections of human tongue.

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

References

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