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ProductInformation

Nerve Growth Factor-7S
from mouse submaxillary glands

Catalog Number **N0513**
Storage Temperature –20 °C

Synonym: NGF-7S

Product Description

Nerve Growth Factor (NGF) was first discovered in 1953 by Levi-Montalcini, Hamburger, and Cohen[1-3] in two mouse sarcomas, and described as a diffusable agent which strongly promotes fiber outgrowth of sensory neurons in chick embryos. Cohen purified NGF from snake venom[4] and from mouse salivary glands.[5]

NGF is a neurotrophic agent thought to be provided by peripheral tissues for the guidance and sustenance of outgrowing embryonic sympathetic and sensory neurons.[6] NGF induces the formation of neurite-like filaments from chick embryo dorsal root ganglia[2] and from rat PC12 pheochromocytoma cells.[7] *In vivo* NGF may be involved in fetal development[8,9] and nerve regeneration.[10] NGF may also play a physiological role within the central nervous system.[8,11,12]

Cellular receptors for NGF have been found in a variety of cell lines[13] and tissues, including cholinergic neurons of the brain[14,15] and Schwann cells of damaged nerve axons.[10] Two kinetic types of NGF receptors have been identified from peripheral neurons,[16] neuroblastoma cells,[17] and PC12 cells[18] and are designated as type I (high affinity) and type II (low affinity). The signal transduction mechanism of the receptor has not been clearly identified.

This product (NGF-7S, Catalog Number N0513) is purified from mouse submaxillary glands under non-dissociative conditions. Nerve Growth Factor isolated under such conditions has a sedimentation coefficient of 7.1 S.[19,20] It is generally believed that NGF-7S is a 130 kDa protein composed of 5 non-covalently linked subunits (2α, 1β, 2γ), although there is recent evidence for a different endogenous form of high molecular weight NGF.[21]

After dissociation of purified NGF-7S by acidic or basic pH, only the β subunit of NGF (NGF-β, Catalog Number N2393) has neurotrophic activity.[6] NGF-β is a 26.5 kDa dimer of identical 118-residue chains held together tightly by noncovalent bonds. NGF-7S is a form of NGF-β, initially isolated under dissociative conditions, but is often slightly different from NGF-β, due to proteolysis during the purification of NGF-β.[6] Apparently the 7S complex protects the amino- and carboxy-terminals of NGF-β from hydrolytic enzymes present in the submaxillary gland extract.[22]

This product is supplied lyophilized from a 0.2 µm filtered solution in 2.5 mM sodium phosphate, pH 7.0.

The Nerve Growth Factor-7S product has been tested for bioactivity using PC-12 cells.[23]
EC_{50}: 2–250 ng/mL

Endotoxin: ≤10 EU/vial

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.

Preparation Instructions

To prepare a stock solution, reconstitute the contents of the vial in a solution of buffered saline or tissue culture medium containing 0.1–1.0% BSA or 1-10% serum. This may be diluted immediately before use to the final working concentration of NGF-7S, generally 0.1–10 ng/ml. Additional filtration of the stock solution is not recommended and may result in product loss due to adsorption onto the filter membrane.

Storage/Stability

Prior to reconstitution, store vial at –20 °C. After reconstitution, the product may be stored in a plastic vial for up to two weeks at 2–8 °C or may be stored as aliquots at –20 °C. Prolonged storage of product or repeated freezing and thawing is not recommended.

References

1. Levi-Montalcini, R., Science, **237**, 1154 (1987).
2. Levi-Montalcini, R., *et al*., Cancer Res., **14**, 49 (1954).
3. Cohen, S., *et al*., Proc. Natl. Acad. Sci. USA, **40**, 1014 (1954).
4. Cohen, S., J. Biol. Chem., **234**, 1129 (1959).
5. Cohen, S., Proc. Natl. Aced. Sci. USA, **46**, 302 (1960).
6. Server, A., and Shooter, E., Adv. Protein Chem., **31**, 339 (1977).
7. Greene, R., and Tischler, A., Proc. Natl. Acad. Sci. USA, **73**, 2424 (1976).
8. Ayer-Lelievre, C., *et al*., Med. Biol., **61**, 296 (1983).
9. Taniuchi, M., *et al*., Proc. Natl. Acad. Sci. USA, **83**, 4094 (1986).
10. Thornburn, G., *et al*., Growth and Maturation Factors, Vol. 3 (G. Guroff, ed.) John Wiley & Sons, (NY, NY: 1985) p.175.
11. Ebendal, T., Prog. Growth Factor Res., **1**, 143 (1989).
12. Dreyfus, C., Trends Pharmacol. Sci., **10**, 145 (1989).
13. Eveleth, D., In Vitro Cell. Dev. Biol., **24**, 1148 (1988).
14. Hefti, F., *et al*., Neurosci. Let., **69**, 37 (1986).
15. Raivich, G., and Kreutzberg, G., Neuroscience, **20**, 23 (1987).
16. Godfrey, E., and Shooter, E., J. Neurosci., **6**, 2543 (1986).
17. Marchetti, D., and Perez-Polo, J., J. Neurochem., **49**, 475 (1987).
18. Buxser, S., *et al*., J. Biol. Chem., **265**, 12701 (1990).
19. Varon, S., *et al*., Biochemistry, **6**, 2202 (1967).
20. Varon, S., *et al*., Biochemistry, **7**, 1296 (1968).
21. Young, M., *et al*., Biochemistry, **27**, 6675 (1988).
22. Moore, J., *et al*., Biochemistry, **13**, 833 (1974).
23. Green, L., J. Cell Biol., **78**, 747 (1928).

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