



Product Information

NERVE GROWTH FACTOR (NGF)

From *Vipera lebetina* Venom

Product No. **N 8133**

Product Description

Nerve Growth Factor (NGF) was first discovered in 1953 from two mouse sarcomas by Levi-Montalcini, Hamburger and Cohen¹⁻³ and described as a diffusible agent which strongly promotes fiber outgrowth of sensory neurons in chick embryos. Cohen purified NGF from snake venom⁴ 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 ganglia² and from rat PC12 pheochromocytoma cells.⁷ *In vivo* NGF may be involved in fetal development^{8,9} and nerve regeneration.¹⁰ Nerve growth factor 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 lines¹³ 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 cells¹⁷ and PC12 cells¹⁸ 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.

Nerve Growth Factor from *Vipera lebetina* venom is a 32.5 kDa glycoprotein reported to exhibit multiple isoelectric forms (pI of 9.2 to 10.5) with all forms also containing weak arginine esterase activity.¹⁹ In mammalian NGF-7S (Product No. N 0513), only the β subunit (Product No. N 2393) has neurotrophic activity and only the γ subunit has arginine esterase activity.²⁰

Performance Characteristics

The biological activity of Nerve Growth Factor from *Vipera lebetina* venom is measured in a cell proliferation assay using PC-12 cells.²¹ The EC₅₀ is defined as the effective concentration of growth factor that elicits a 50% increase in cell growth in a cell based bioassay.

Product Information

Purified from *Vipera lebetina* venom

Molecular Weight: 32.5 kDa

EC₅₀: 0.2-20 μ g/ml

Package Size: 100 μ g

Formulation: Lyophilized from 0.2 μ m-filtered sodium acetate buffer.

Carrier Protein: None

Sterility: 0.2 μ m-filtered, aseptic fill

Endotoxin: <10 Endotoxin Units/vial

Reconstitution and Use

To prepare a stock solution, reconstitute the vial contents in sterile medium or balanced salt solution containing a minimum of 0.25 to 1 mg/ml protein. This may be diluted immediately before use to the final working concentration of NGF, generally 0.1 to 10 μ g/ml, according to the planned application. If aseptic technique is used, additional filtration of the stock solution should **not** be necessary and should be avoided due to possible adsorption onto the filter membrane.

Storage and Stability

Prior to reconstitution store vial below 0 °C. After reconstitution, the product may be stored for 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. Acad. 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, p.175 (1985).
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. Siigur, E., et al., Comp. Biochem. Physiol., **81B**, 211 (1985).
20. Varon, S., et al., Biochemistry, **7**, 1296 (1968).
21. Greene, L., J. Cell Biol., **78**, 747 (1978).

4/98

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.