# Recombinant Human Neuropilin-1

Catalog Number: 3870-N1

## DESCRIPTION

| | |
|---|---|
| **Source** | Mouse myeloma cell line, NS0-derived human Neuropilin-1 protein<br>Phe22-Lys644, with a C-terminal 6-His tag<br>Accession # NP_001019799 |
| **N-terminal Sequence Analysis** | Phe22 |
| **Predicted Molecular Mass** | 70.6 kDa |

## SPECIFICATIONS

| | |
|---|---|
| **SDS-PAGE** | 85-95 kDa, reducing conditions |
| **Activity** | Measured by its binding ability in a functional ELISA.<br>Immobilized Recombinant Human Neuropilin-1 can bind recombinant human $VEGF_{165}$ with an apparent $K_d$ <1 nM. |
| **Endotoxin Level** | <0.01 EU per 1 µg of the protein by the LAL method. |
| **Purity** | >95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining. |
| **Formulation** | Lyophilized from a 0.2 µm filtered solution in PBS. See Certificate of Analysis for details. |

## PREPARATION AND STORAGE

| | |
|---|---|
| **Reconstitution** | Reconstitute at 100 µg/mL in sterile PBS. |
| **Shipping** | The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below. |
| **Stability & Storage** | **Use a manual defrost freezer and avoid repeated freeze-thaw cycles.**<br>• 12 months from date of receipt, -20 to -70 °C as supplied.<br>• 1 month, 2 to 8 °C under sterile conditions after reconstitution.<br>• 3 months, -20 to -70 °C under sterile conditions after reconstitution. |

## BACKGROUND

Neuropilin-1 protein (Nrp1, previously neuropilin; also CD304) is a 130 - 140 kDa type I transmembrane (TM) glycoprotein that regulates axon guidance and angiogenesis (1 - 4). The full-length 923 amino acid (aa) human NRP1 contains a 623 aa extracellular domain (ECD) that shows 92 - 95% aa identity with mouse, rat, bovine and canine NRP1 (3, 4). The NRP1 ECD contains two N-terminal CUB domains (termed a1a2), two domains with homology to coagulation factors V and VIII (b1b2) and a MAM (meprin) domain (c). C-terminally divergent splice variants with 704, 644, 609, and 551 aa lack the MAM and TM domains and are demonstrated or presumed to be soluble antagonists (1, 5 - 7). A 906 aa form lacks a TM segment, but secretion has not been found (8). The sema domains of Class III secreted semaphorins such as Sema3A bind NRP1 a1a2 (9). Heparin, the heparin-binding forms of VEGF (VEGF165, VEGF-B and VEGF-E), PlGF (PlGF2), and the C-terminus of Sema3 bind the b1b2 region (9, 10). NRP1 and NRP2 share 48% aa identity within the ECD and can form homo- and hetero-oligomers via interaction of their MAM domains (1). Neuropilins show partially overlapping expression in neuronal and endothelial cells during development (1, 2). Both neuropilins act as co-receptors with plexins, mainly plexin A3 and A4, to bind class III semaphorins that mediate axon repulsion (11). However, only NRP1 binds Sema3A, and only NRP2 binds Sema3F (1). Both are co-receptors with VEGF R2 (also called KDR or Flk-1) for VEGF165 binding (1). Sema3A signaling can be blocked by VEGF165, which has higher affinity for NRP1 (12). NRP1 is preferentially expressed in arteries during development or those undergoing remodeling (1, 2). NRP1 is also expressed on dendritic cells and mediates DC-induced T cell proliferation (13).

Neuropilin-1 has been shown to bind to the S1 domain of the SARS-CoV-2 Spike protein via its b1 domain (14,15). Blocking this interaction reduced viral entry and infectivity in vitro providing a new potential therapeutic target to treat COVID-19.

**References:**


1. Bielenberg, D.R. et al. (2006) Exp. Cell Res. **312**:584.
2. Gu, C. et al. (2003) Dev. Cell **5**:45.
3. He, Z. and M. Tessier-Lavigne (1997) Cell **90**:739.
4. Soker, S. et al. (1998) Cell **92**:735.
5. Gagnon, M.L. et al. (2000) Proc. Natl. Acad. Sci. USA **97**:2573.
6. Cackowski, F.C. et al. (2004) Genomics **84**:82.
7. Rossignol, M. et al. (2000) Genomics **70**:211.
8. Tao, Q. et al. (2003) Angiogenesis **6**:39.
9. Gu, C. et al. (2002) J. Biol. Chem. **277**:18069.
10. Mamluk, R. et al. (2002) J. Biol. Chem. **277**:24818.
11. Yaron, A. et al. (2005) Neuron **45**:513.
12. Narazaki, M. and G. Tosato (2006) Blood **107**:3892.
13. Tordjman, R. et al. (2002) Nat. Immunol. **3**477.
14. Daly, J.L. et al. (2020) Science. Oct 20:eabd3072. doi: 10.1126/science.abd3072.
15. Cantuti-Castelvetri L. et al. (2020) Science. Oct 20:eabd2985. doi: 10.1126/science.abd2985.




bio-techne®
Global bio-techne.com info@bio-techne.com techsupport@bio-techne.com TEL +1 612 379 2956
USA TEL 800 343 7475 Canada TEL 855 668 8722 China TEL +86 (21) 52380373
Europe | Middle East | Africa TEL +44 (0)1235 529449