

**N2 Neuraminidase (NA) Protein with N-Terminal Histidine Tag from Influenza Virus, A/Wisconsin/67/2005 (H3N2), Recombinant from Baculovirus**

**Catalog No. NR-19237**

This reagent is the tangible property of the U.S. Government.

**For research use only. Not for human use.**

**Contributor and Manufacturer:**

BEI Resources

**Product Description:**

The N2 neuraminidase (NA) protein from influenza A virus, A/Wisconsin/67/2005 (H3N2) containing an N-terminal histidine tag was produced in Sf9 (Invitrogen™ 11496-015) insect cells using a baculovirus expression vector system and was purified by nickel affinity chromatography. The predicted ectodomain coding region of the NA gene was fused to a synthetic gene segment encoding an N-terminal eight-histidine tag followed by a 43 amino acid tetramerization domain from vasodilator-stimulated phosphoprotein (VASP)<sup>1</sup> and a thrombin cleavage site, as described for the 1918 pandemic virus.<sup>2</sup> The predicted protein sequence is shown in Table 1. The full-length N2 NA precursor protein is 469 residues (GenPept: ABW80983).

**Material Provided:**

Each vial contains approximately 150 to 250 µg of purified recombinant NA protein in phosphate buffered saline, pH 7.4 (PBS). The protein content in µg and the concentration, expressed as µg/mL, are shown on the Certificate of Analysis.

**Packaging/Storage:**

Purified recombinant NA protein was packaged aseptically in screw-capped plastic cryovials. This product is provided frozen and should be stored at -20°C or colder immediately upon arrival. For long-term storage, freezing at -80°C or colder is recommended. Multiple freeze-thaw cycles should be avoided.

**Functional Activity:**

NR-19237 was demonstrated to be functionally active based on its ability to cleave the fluorogenic substrate 2'-(4-methylumbelliferyl)-α-D-N-acetylneuraminic acid (4-MUNANA).<sup>3</sup>

**Citation:**

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: N2 Neuraminidase (NA) Protein with N-Terminal Histidine

Tag from Influenza Virus, A/Wisconsin/67/2005 (H3N2), Recombinant from Baculovirus, NR-19237."

**Biosafety Level: 1**

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 5th ed. Washington, DC: U.S. Government Printing Office, 2007; see [www.cdc.gov/od/ohs/biosfty/bmb15/bmb15toc.htm](http://www.cdc.gov/od/ohs/biosfty/bmb15/bmb15toc.htm).

**Disclaimers:**

You are authorized to use this product for research use only. It is not intended for human use.

Use of this product is subject to the terms and conditions of the BEI Resources Material Transfer Agreement (MTA). The MTA is available on our Web site at [www.beiresources.org](http://www.beiresources.org).

While BEI Resources uses reasonable efforts to include accurate and up-to-date information on this product sheet, neither ATCC® nor the U.S. Government make any warranties or representations as to its accuracy. Citations from scientific literature and patents are provided for informational purposes only. Neither ATCC® nor the U.S. Government warrants that such information has been confirmed to be accurate.

This product is sent with the condition that you are responsible for its safe storage, handling, use and disposal. ATCC® and the U.S. Government are not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to ensure authenticity and reliability of materials on deposit, the U.S. Government, ATCC®, their suppliers and contributors to BEI Resources are not liable for damages arising from the misidentification or misrepresentation of products.

**Use Restrictions:**

**This material is distributed for internal research, non-commercial purposes only.** This material, its product or its derivatives may not be distributed to third parties. Except as performed under a U.S. Government contract, individuals contemplating commercial use of the material, its products or its derivatives must contact the contributor to determine if a license is required. U.S. Government contractors may need a license before first commercial sale.

**References:**

1. Kühnel, K., et al. "The VASP Tetramerization Domain is a Right-Handed Coiled Coil Based on a 15-Residue Repeat." Proc. Natl. Acad. Sci. USA 101 (2004): 17027-17032. PubMed: 15569942.
2. Xu, X., et al. "Structural Characterization of the 1918

- Influenza Virus H1N1 Neuraminidase.” *J. Virol.* 82 (2008): 10493-10501. PubMed: 18715929.
3. Wetherall, N. T., et al. “Evaluation of Neuraminidase Enzyme Assays Using Different Substrates to Measure Susceptibility of Influenza Virus Clinical Isolates to Neuraminidase Inhibitors: Report of the Neuraminidase Inhibitor Susceptibility Network.” *J. Clin. Microbiol.* 41 (2003): 742-750. PubMed: 12574276.

ATCC® is a trademark of the American Type Culture Collection.



**Table 1 – Predicted Protein Sequence**

1	<a href="#">ADPHHHHHH</a>	<a href="#">HSSSDYSDLQ</a>	<a href="#">RVKQELLEEV</a>	<a href="#">KKELOKVKEE</a>	<a href="#">IIEAFVQELR</a>
51	<a href="#">KRGSLVPRGS</a>	<a href="#">PSRSEFEICP</a>	<a href="#">KLAEYRNWSK</a>	<a href="#">PQCNITGFAP</a>	<a href="#">FSKDNSIRLS</a>
101	<a href="#">AGGDIWVTRE</a>	<a href="#">PYVSCDPDKC</a>	<a href="#">YQFALGQGT</a>	<a href="#">LNNVHSNDTV</a>	<a href="#">HRTPYRTL</a>
151	<a href="#">MNELGVPFHL</a>	<a href="#">GTKQVCIAWS</a>	<a href="#">SSSCHDGKAW</a>	<a href="#">LHVCVTGDDK</a>	<a href="#">NATASFIYNG</a>
201	<a href="#">RLVDSIVSWS</a>	<a href="#">KEILRTQESE</a>	<a href="#">CVCINGTCTV</a>	<a href="#">VMTDGSASGK</a>	<a href="#">ADTKILFIEE</a>
251	<a href="#">GKIVHTSTLS</a>	<a href="#">GSAQHVEECS</a>	<a href="#">CYPRYLGVRC</a>	<a href="#">VCRDNWKGSN</a>	<a href="#">RPIVDINIKD</a>
301	<a href="#">YSIVSSYVCS</a>	<a href="#">GLVGDTPRKN</a>	<a href="#">DSSSSSHCLD</a>	<a href="#">PNNEEGGHGV</a>	<a href="#">KGWAFDDGND</a>
351	<a href="#">VWMGRTISEK</a>	<a href="#">LRSGYETFKV</a>	<a href="#">IEGWSNPNSK</a>	<a href="#">LQINRQVIVD</a>	<a href="#">RGNRSGYSGI</a>
401	<a href="#">FSVEGKSCIN</a>	<a href="#">RCFYVELIRG</a>	<a href="#">RKEETEVLWT</a>	<a href="#">SNSIVVFCGT</a>	<a href="#">SGTYGTGSWP</a>
451	<a href="#">DGADINLMPI</a>				

Plasmid-derived amino acids – Residues 1 to 3 and 61 to 66

His Tag – Residues 4 to 11

Tetramerization domain – [Residues 12 to 54](#)

Thrombin cleavage sequence – Residues 55 to 60

NA protein – **Residues 67 to 460\***

\*This represents amino acid residues 76 to 469 of the A/Wisconsin/67/2005 (H3N2) NA protein.