

Shiga Toxin Type 1 Subunit B, Recombinant from *Escherichia coli*

Catalog No. NR-860

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Contributor and Manufacturer:

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Product Description:

NR-860 is a recombinant form of the B subunit of Shiga toxin type 1 (Stx1). The amino acid sequence includes a C-terminal hexa-histidine tag and amino acid residues 21 to 89 of the Stx1 subunit B protein (GenPept: AAA98348).¹ The recombinant protein was expressed in *Escherichia coli* (*E. coli*) and purified by nickel affinity chromatography. NR-860 has a theoretical molecular weight of approximately 8,513 daltons. The predicted amino acid sequence of NR-860 is shown below in Table 1.

The term Shiga toxin (Stx) refers to two families of related toxins: Shiga toxin/Shiga-like toxin 1 and Shiga-like toxin 2.^{2,3} Shiga toxin is produced by *Shigella dysenteriae*, while Shiga-like toxin 1 and Shiga-like toxin 2 are both produced by enterohemorrhagic strains of *E. coli*. Stx are multimeric molecules that are comprised of two polypeptide subunits, A and B. The Stx B subunit is a pentamer that binds the toxin to glycolipids on host cell membranes and the entire Stx molecule can then enter the cell via endocytosis.⁴ Once inside the cell, the Stx A subunit undergoes proteolytic cleavage and the reduction of an internal disulfide bond to generate Stx A₁ and Stx A₂. Stx A₁ is an N-glycosidase that catalytically inactivates the 28S ribosomal RNA subunit to inhibit protein synthesis.⁵ The nucleotide sequences of the genes for the Shiga-like toxin 1 B subunit from *E. coli* (GenBank: AB035142) and the Stx B subunit from *S. dysenteriae* (GenBank: M24352) have been reported.

Material Provided:

Each vial of NR-860 contains approximately 1 mg of recombinant Stx1 subunit B suspended in phosphate buffered saline (pH 7.4). NR-860 lot 57680170 contains approximately 0.1 mg per vial suspended in phosphate buffered saline (pH 7.4). The concentration, expressed as mg per mL, is shown on the Certificate of Analysis.

Packaging/Storage:

NR-860 was packaged aseptically in plastic cryovials. The product is provided frozen on dry ice and should be stored at -20°C or colder immediately upon arrival. Repeated freeze-thaw cycles should be avoided.

Functional Activity:

NR-860 reacts with mouse monoclonal antibody to Shiga toxin type 1 subunit B (BEI Resources NR-844).

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: Shiga Toxin Type 1 Subunit B, Recombinant from *Escherichia coli*, NR-860."

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, 2009; see www.cdc.gov/biosafety/publications/bmb15/index.htm.

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References:

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2. Sandvig, K. "Shiga Toxins." Toxicon 39 (2001): 1629-1635. PubMed: 11595626.
3. O'Loughlin, E. V. and R. M. Robins-Browne. "Effect of Shiga Toxin and Shiga-like Toxins on Eukaryotic Cells." Microbes Infect. 3 (2001): 493-507. PubMed: 11377211.
4. Sandvig, K., et al. "Endocytosis from Coated Pits of Shiga Toxin: A Glycolipid-binding Protein from *Shigella dysenteriae* 1." J. Cell Biol. 108 (1989): 1331-1343. PubMed: 2564398.
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6. Perera, L. P., et al. "Identification of Three Amino Acid Residues in the B Subunit of Shiga Toxin and Shiga-Like Toxin Type II That Are Essential for Holotoxin Activity." J. Bacteriol. 173 (1991): 1151-1160. PubMed: 1991714.

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Table 1 – Predicted Protein Sequence

1	TPDCVTGKVE	YTKYNDDDTF	TVKVGDKELF	TNRWNLQSLL	LSAQITGMTV
51	TIKTNACHNG	GGFSEVIFRH	<u>HHHHH</u>		

Non-shiga toxin residues are underlined.