Product Information Sheet for NR-50763

Heat-Stable Enterotoxin (STh) from Enterotoxigenic *Escherichia coli*

Catalog No. NR-50763

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For research use only. Not for human use.

Contributor and Manufacturer:

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Product Description:

NR-50763 is a preparation of the human variant of heat-stable enterotoxin (STh) purified from enterotoxigenic *Escherichia coli* (*E. coli*) (ETEC) obtained from an ST^+-ETEC strain, grown in 4AA broth under laboratory conditions as described previously.[1] The protein was purified from the culture supernatant by tangential flow filtration, hydrophobic interaction chromatography (HIC), gel filtration chromatography, and high-pressure reverse phase liquid chromatography.[2] The expected molecular weight of STh is 2,048 Da.

The ETEC infectious process is initiated by the organism adhering to the host intestinal epithelial cells via interactions between bacterial adhesions, colonization factors [including colonization factor antigens (CFAs), coli surface (CS), and putative colonization factors (PCFs)] and host receptors.[3] ETEC then causes secretory diarrhea by expressing heat-labile enterotoxin and/or STh.[4] STh can cause secretory diarrhea in susceptible mammalian species, including humans, by binding to the guanylyl cyclase-C (GC-C) receptor of intestinal epithelial cells to stimulate the intracellular accumulation of cGMP, which subsequently, indirectly activates the cystic fibrosis transmembrane receptor (CFTR) to release cations followed by water into the lumen of the bowel.[5,6]

Material Provided:

Each vial of NR-50763 contains approximately 0.5 mg of STh in 5 mM sodium phosphate, 145 mM NaCl buffer, pH 7.2 (± 0.2). The concentration, expressed as mg per mL, is shown on the Certificate of Analysis.

Packaging/Storage:

NR-50763 was packaged aseptically in glass screw cap vials. The product is provided frozen on dry ice and should be stored at -20°C ± 5°C immediately upon arrival. Freeze-thaw cycles should be avoided.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: Heat-Stable Enterotoxin (STh) from Enterotoxigenic *Escherichia coli*, NR-50763."

Biosafety Level: 2

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/bmbl5/index.htm.

Disclaimers:

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References:

1. Alderete, J. F. and D. C. Robertson. "Purification and Chemical Characterization of the Heat-Stable Enterotoxin Produced by Porcine Strains of Enterotoxigenic *Escherichia coli*." Infect. Immun. 19 (1978): 1021-1030. PubMed: 346481.
2. Bitoun J. P., Personal Communication.
3. Beachey, E. H. "Bacterial Adherence: Adhesin-Receptor Interactions Mediating the Attachment of Bacteria to Mucosal Surface." J. Infect. Dis. 143 (1981): 325-345. PubMed: 7014727.

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4. Yamamoto, T. and T. Yokota. "Plasmids of Enterotoxigenic *Escherichia coli* H10407: Evidence for Two Heat-Stable Enterotoxin Genes and a Conjugal Transfer System. J. Bacteriol. 153 (1983): 1352-1360. PubMed: 6298182.
5. Taxt, A. M., et al. "Characterization of Immunological Cross-Reactivity between Enterotoxigenic *Escherichia coli* Heat-Stable Toxin and Human Guanylin and Uroguanylin." Infect. Immun. 82 (2014): 2913-2922. PubMed: 24778111.
6. Taxt, A. M., et al. "Towards Rational Design of a Toxoid Vaccine against the Heat-Stable Toxin of *Escherichia coli*." Infect. Immun. 84 (2014): 1239-1249. PubMed: 26883587.

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