Product Information Sheet for NR-33152

β-Cyclodextrin Derivative IB102 (AMBnTβCD)

Catalog No. NR-33152

For research use only. Not for human use.

Contributor:
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Manufacturer:
Innovative Biologics, Inc.

Product Description:
β-Cyclodextrin (β-CD) is a cyclic molecule comprising of seven D-glucose units and having seven-fold symmetry. Persubstituted β-CD derivatives are small molecules with a seven-fold symmetry that mirrors the heptameric, pore-forming toxins that are essential in the mechanism of action of several bacterial pathogens. Persubstituted β-CD derivatives can be utilized in a strategy to inhibit pore-forming toxins, which is based on the blocking of the target pore with molecules having the same symmetry as the pore itself.[1,2]

NR-33152 is a hepta-6-substituted β-CD derivative {per-6-S-[(3-aminomethyl)-benzylthio]-β-CD hydrochloride (AMBnTβCD); IB102} designed to target pore-forming toxins. NR-33152 has a theoretical molecular weight of approximately 2,332 g/mol. The structure of NR-33152 is shown below (Figure 1).

Material Provided:
Each vial contains approximately 0.7 mg of NR-33152 in dimethylsulfoxide (DMSO).

Note: Once product is thawed, vortex to ensure homogeneity.

Packaging/Storage:
NR-33152 was packaged aseptically in screw-capped plastic cryovials. The product is provided frozen and should be stored at -20°C or colder immediately upon arrival. Excessive freeze-thaw cycles should be avoided.

Functional Activity:
AMBnTβCD inhibits the cytotoxicity of *Bacillus anthracis* lethal toxin (in J774A.1 or RAW 264.7 cells) and edema toxin (in CHO-K1 cells) as well as blocks ion conductance through the pores formed by protective antigen in artificial lipid membranes.[3] AMBnTβCD also neutralized the cytopathic activity of *Clostridium difficile* toxins A, B and CDT, *Clostridium botulinum* C2 toxin, and *Clostridium perfringens* iota toxin.[4] Its protective properties have been demonstrated in two animal models.[5]

Citation:
Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: β-Cyclodextrin Derivative IB102 (AMBnTβCD), NR-33152."

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/bmbl5/index.htm.

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References:
1. Innovative Biologics, Inc.
2. Karginov, V. A., et al. "Blocking Anthrax Lethal Toxin at the Protective Antigen Channel by Using Structure-

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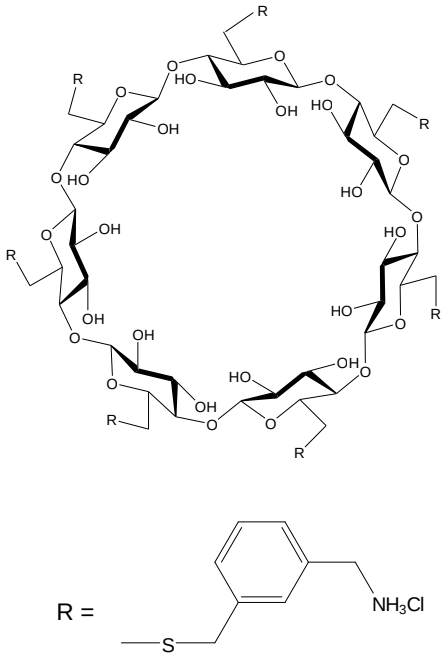
inspired Drug Design." Proc. Natl. Acad. Sci. U.S.A. 102 (2005): 15075-15080. PubMed: 16214885.

3. Karginov, V. A., et al. "Search for Cyclodextrin-Based Inhibitors of Anthrax Toxins: Synthesis, Structural Features, and Relative Activities." Antimicrob. Agents Chemother. 50 (2006): 3740-3753. PubMed: 16982795.
4. Nestorovich, E. M., et al. "Tailored ß-Cyclodextrin Blocks the Translocation Pores of Binary Exotoxins from *C. botulinum* and *C. perfringens* and Protects Cells from Intoxication." PLoS One 6 (2011): e23927. PubMed: 21887348.
5. Moayeri, M., T. M. Robinson, S. H. Leppla, and V. A. Karginov. "In Vivo Efficacy of β-Cyclodextrin Derivatives against Anthrax Lethal Toxin." Antimicrob. Agents Chemother. 52 (2008): 2239-2241. PubMed: 18378717.
6. Yannakopoulou, K., et al. "Symmetry Requirements for Effective Blocking of Pore-Forming Toxins: Comparative Study with α-, β-, and γ-Cyclodextrin Derivatives." Antimicrob. Agents Chemother. 55 (2011): 3594-3597. PubMed: 21555769.

Support Provided by NIAID

Figure 1



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