

Product Information

Shiga toxin 1, B subunit recombinant, expressed in *E. coli*

Catalog Number **SML0562**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

Synonyms: STxB, STX1, SLT1

Product Description

The Shiga toxins are a family of related protein toxins secreted by certain types of bacteria. Shiga toxin (Stx) is produced by *Shigella dysenteriae*; whereas, the Shiga-like toxins, Stx1 and Stx2, with a few known isoforms, are secreted by specific strains of *Escherichia coli* named Shiga-toxin-producing *E. coli* (STEC) such as *E. coli* O157:H7, which causes bloody diarrhea and hemorrhagic colitis in humans, sometimes resulting in fatal systemic complications.¹

Stx1 is identical to Stx, while the Stx2 isoforms share less sequence similarity with Stx (~60%) and are immunologically distinct. In spite of the differences in their amino acid sequence, all Stx isoforms share the same overall toxin structure and mechanism of action.²

Shiga toxins consist of two polypeptides. An A chain² and a B chain³ non-covalently associate with an apparent stoichiometry of one A and five B chains to form the holotoxin.⁴ The catalytic A subunit has RNA N-glycosidase activity that inhibits eukaryotic protein synthesis.¹ The B subunits form a pentamer, which recognizes and binds to the functional cell-surface receptor globotriaosylceramide [Gb3, Gala(1-4)-Galb(1-4)-Glc1-ceramide].¹ Gb3 is overexpressed in membranes of numerous tumor cells,^{5,6} therefore STxB binding to Gb3 receptors may be useful for cell-specific vectorization, labeling, and imaging purposes.⁵⁻⁷

This recombinant product is Shiga toxin 1, B subunit, a 7 kDa protein containing 69 amino acid residues. It is lyophilized from 0.2 μm -filtered solution of phosphate buffer without any carrier protein.

Purity: $\geq 95\%$ (SDS-PAGE)

Gb3 Binding activity: significant binding above background is achieved with 1 $\mu\text{g}/\text{mL}$ of STxB. The activity of STxB is measured by its ability to bind to Gb3, which requires its pentameric form.⁸

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Reconstitute the contents of the vial using water to a concentration of 0.1–1.0 mg/mL. This solution can then be further diluted into other aqueous buffers and stored at 2–8 $^{\circ}\text{C}$ for up to 4 months or at $-20\text{ }^{\circ}\text{C}$ for extended use.

Storage/Stability

Prior to reconstitution, the lyophilized protein is best stored at $-20\text{ }^{\circ}\text{C}$. After reconstitution and for extended storage, freeze in working aliquots at $-20\text{ }^{\circ}\text{C}$. Repeated freezing and thawing is not recommended.

References

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7. Engedal, N. et al., Shiga toxin and its use in targeted cancer therapy and imaging. *Microb. Biotechnol.*, **4**, 32–46 (2011).
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