

Toxin B/TcdB Protein, *C. difficile* (His)

Cat. No.:	HY-P79219
Synonyms:	Toxin B; Glucosyltransferase TcdB; toxB
Species:	Others
Source:	<i>E. coli</i>
Accession:	P18177 (M1-L543)
Gene ID:	4914074
Molecular Weight:	approximately 65 kDa

PROPERTIES

AA Sequence	<pre> MSLVNRKQLE KMANVRFRTQ EDEYVAILDA LEEYHNMSEN TVVEKYLKLLK DINSLTDIYI DTYKKSGRNK ALKKFKEYLV TEVLELKNNN LTPVEKNLHF VWIGGQINDT AINYINQWKD VNSDYNVNVF YDSNAFLINT LKKTVVESAI NDTLESFREN LNDPRFDYNK FFRKRMEIY DKQKNFINYY KAQREENPEL IIDDIVKTYL SNEYSKEIDE LNTYIEESLN KITQNSGNDV RNFEEFKNGE SFNLYEQELV ERWNLAAASD ILRISALKEI GGMYLDVDML PGIQPDFES IEKPSSVTVD FWEMTKLEAI MKYKEYIPEY TSEHFDMLDE EVQSSFESVL ASKSDKSEIF SSLGDMEASP LEVKIAFNSK GIINQGLISV KDSYCSNLIV KQIENRYKIL NNSLNPAISE DNDFNTTNT FIDSIMAEAN ADNGRFMMEL GKYL RVGFFP DVKTTINLSG PEAYAAAYQD LLMFKEGSMN IHLIEADLRN FEISKTNISQ STEQEMASLW SFDDARAKAQ FEEYKRNYFE GSL </pre>
Biological Activity	Measured by its ability to hydrolyze UDP-Glucose. The specific activity is 33.1357 pmol/min/μg, as measured under the described conditions.
Appearance	Solution.
Formulation	Supplied as a 0.2 μm filtered solution of 50 mM Tris-HCL, 300 mM NaCL, pH 8.0.
Endotoxin Level	<1 EU/μg, determined by LAL method.
Reconstitution	N/A.
Storage & Stability	Stored at -80°C for 1 year. It is stable at -20°C for 3 months after opening. It is recommended to freeze aliquots at -80°C for extended storage. Avoid repeated freeze-thaw cycles.
Shipping	Shipping with dry ice

DESCRIPTION

Background

Toxin B/TcdB Protein serves as the precursor of a cytotoxin that strategically targets and disrupts the colonic epithelium, thereby instigating host inflammatory and innate immune responses that manifest as diarrhea and pseudomembranous colitis. This cytotoxin, TcdB, plays a central role in the pathology of *C. difficile* infection, an opportunistic pathogen that takes hold in the colon when the normal gut microbiome is disrupted. In comparison to TcdA, TcdB demonstrates heightened virulence and is particularly instrumental in eliciting host inflammatory and innate immune responses. Functioning as the precursor of the toxin, Toxin B enters host cells and undergoes autoprocessing, leading to the release of the active toxin, Glucosyltransferase TcdB, into the host cytosol. The toxin targets colonic epithelia by binding to frizzled receptors such as FZD1, FZD2, and FZD7, entering host cells through clathrin-mediated endocytosis. While frizzled receptors are primary in the colonic epithelium, additional receptors like CSPG4 or NECTIN3/PVRL3 have been identified. Carbohydrate and sulfated glycosaminoglycan binding on the host cell surface also contributes to cellular entry. Once inside host cells, acidification in the endosome triggers membrane insertion of the translocation region and pore formation, facilitating translocation of the GT44 and peptidase C80 domains across the endosomal membrane. This initiates the activation of the peptidase C80 domain through autocatalytic processing, releasing the N-terminal part (Glucosyltransferase TcdB) as the active toxin in the cytosol. The active form of the toxin, through monoglucosylation, inactivates small GTPases of the Rho family (Rac1, RhoA, RhoB, RhoC, RhoG, and Cdc42) in host cells, preventing downstream effector recognition, thereby disrupting the actin cytoskeleton and inducing cell death. This sequence of events results in the loss of colonic epithelial barrier function, contributing to the severe manifestations of *C. difficile* infection.

Caution: Product has not been fully validated for medical applications. For research use only.

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