

Toxin B (TcdB), Purified from *Clostridium difficile*, Strain 1470

Catalog No. NR-41659

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Contributor and Manufacturer:

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Product Description:

Toxin B (TcdB) was purified from culture supernatant of *Clostridium difficile* (*C. difficile*), strain 1470. It was purified by chromatographic techniques. The sequence of TcdB is provided in Figure 1 (GenPept: CAA80815).

C. difficile (sometimes referred to as *Peptoclostridium difficile*) is a Gram-positive, spore-forming, obligate anaerobe that commonly inhabits the intestinal tract of various mammalian species, reptiles and birds, and may also be found in the environment.¹ Pathogenic strains of *C. difficile* generally produce a 308 kDa enterotoxin (TcdA) and a 270 kDa cytotoxin (TcdB).² Both toxins are glucosyltransferases and function by inactivating the Ras superfamily of small GTPases in target cells. Production of these toxins in the gut leads to pseudomembranous colitis (PMC) and *C. difficile* associated diarrhea (CDAD).³

Material Provided:

Each vial of NR-41659 contains approximately 4.2 µg of protein in 10 mM phosphate buffer, pH 7, with 14% glycerol. Approximately 50% of the total protein is TcdB (2.1 µg) and the remainder is an unknown contaminant. The concentration, expressed as mg/mL, is shown on the Certificate of Analysis.

Packaging/Storage:

NR-41659 was packaged aseptically in plastic cryovials. The product is provided on ice bricks and should be stored at -20°C immediately upon arrival. Freeze-thaw cycles should be avoided.

Functional Activity:

NR-41659 has been shown to react with a mouse antibody to TcdB (F511). NR-41659 exhibits very weak cytotoxicity in Vero cells.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: Toxin B (TcdB), Purified from *Clostridium difficile*, Strain 1470, NR-41659."

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.

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References:

1. Yutin, N. and M. Y. Galperin. "A Genomic Update on Clostridial Phylogeny: Gram-Negative Spore-Formers and Other Misplaced Clostridia." Environ. Microbiol. 15 (2013): 2631-2641. PubMed: 23834245.
2. Rupnik, M., M. H. Wilcox and D. N. Gerding. "*Clostridium difficile* Infection: New Developments in Epidemiology and Pathogenesis." Nat. Rev. Microbiol. 7 (2009): 526-536. PubMed: 19528959.
3. Kelly, C. P. and J. T. LaMont. "*Clostridium difficile* - More Difficult than Ever." N. Engl. J. Med. 359 (2008): 1932-1940. PubMed: 18971494.

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Figure 1 – Toxin B (TcdB) from *C. difficile*, Strain 1470

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1  MSLVNRKQLE KMANVRFVRVQ EDEYVAILDA LEEYHNMSEN TVVEKYLKLK DINSLTDTYI
61  DTYKKSGRNK ALKKFKEYLV IEILELKNSN LTPVEKNLHF IWIGGQINDT AINYINQWKD
121 VNSDYNVNVF YDSNAFLINT LKKTIIIESAS NDTLESFREN LNDPEFNHTA FFRKRMQIIY
181 DKQQNFINY KAQKEENPDL IIDDIVKTYL SNEYSKDIDE LNAYIEESLN KVTENSGNDV
241 RNFEEFKTGE VFNLYEQESV ERWNLGASD IILRVAILKNI GGVYLDVDML PGIHPDLFKD
301 INKPDVSKTA VDWEEMQLEA IMKHKEYIPE YTSKHFDITLD EEVQSSFESV LASKSDKSEI
361 FLPLGDIEVS PLEVKIAFAK GSIINQALIS AKDSYCSDLL IKQIQNRYKI LNDTLGPIIS
421 QGNDFNTTMN NFGESLGAIA NEENISFIAK IGSYLRVGFY PEANTTITLS GPTIYAGAYK
481 DLLTFKEMSI DTSILSSELN NFEFPKVNIS QATEQEKNSL WQFNEERAKI QFEYKKNYF
541 EGALGEDDNL DFSQNTVTDK EYLLEKISSS TKSEGGYVH YIVQLQGDKI SYEACNLFA
601 KNPYDSILFQ RNIEDSEVAY YNPSTDSEIQ EIDKYRIPDR ISDRPKIKLT FIGHGKAEFN
661 TDIFAGLDVD SLSSEIETAI GLAKEDISP K SIEINLLGCN MFSYSVNVEE TYPGKLLLRV
721 KDKVSELMPS MSQDSIIVSA NQYEVRIINSE GRRELLDHSG EWINKEESI KDISKEYIS
781 FNPKENKIIV KSKNLPELST LLQEIRNNSN SSDIELEEKV MLAECEINVI SNIETQVVEE
841 RIEEAKSLTS DSINYIKNEF KLIESISEAL CDLKQONELE DSHFISFEDI SETDEGFSIR
901 FINKETGESI FVETEKTIFFS EYANHITTEI SKIKGTIFDT VNGKLVKKNV LDTTHEVNTL
961 NAAFFIQSLI EYNSSKESLS NLSVAMKVQV YAQLFSTGLN TITDAAKVVE LVSTALDETI
1021 DLLPTLSEGL PIIATIIDGV SLGAAIKELS ETSDPLLRQE IEAKIGIMAV NLTTATTAI
1081 TSSLGIASGF SILLVPLAGI SAGIPSLVNN ELVLRDKATK VVDYFKHVSL VETEGVFTLL
1141 DDKVMMQDD LVISEIDFNN NSIVLGKCEI WRMEGGSHT VTDDIDHFFS APSITYREPH
1201 LSIYDVLEVQ KEELDLSKDL MVLPNAPNRV FAWETGWTPG LRSLENDGTK LLDRIRDNYE
1261 GEFYWRYFAF IADALITTLK PRYEDTNIRI NLDSNTRSFI VPIITTEYIR EKLSYSFYGS
1321 GGTALPLSQ YNMGINIELS ESDVWIIDVD NVVRDVTIES DKIKKGLDIE GILSTLSIEE
1381 NKIILNSHEI NFSGEVNGSN GFVSLTFSIL EGINAIIIEVD LLSKSYKLLI SGELKILMLN
1441 SNHIQQKIDY IGFNSELQKN IPYSFVDSEG KENGFINGST KEGLFVSELP DVVLISKVYM
1501 DDSKPSFGYY SNNLKDVKVI TKDNVNILTG YYLKDDIKIS LSLTLQDEKT IKLNSVHLDE
1561 SGVAEILKFM NRKGSTNTSD SLMSFLESMN IKSIFVNFLQ SNIKFIELDAN FIISGTTSIG
1621 QFEFICDENN NIQPYFIKFN TLETNYTLYV GNRQNMIVEP NYDLDDSGDI SSTVINFSQK
1681 YLYGIDSCVN KVVISPNIYT DEINITPVYE TNNTYPEVIV LDANYINEKI NVNINDLSIR
1741 YVWSNDGNDF ILMSTSEENK VSQVKIRFVN VFKDKTLANK LSFNFSQKQD VPVSEIILSF
1801 TPSYYEDGLI GYDLGLVSLY NEKFYINNFV MMVSGLIYIN DSYLYFKPPV NNLITGFVTV
1861 GDDKYFNPFI NGGAASIGET IIDDKNYFFN QSGVLQTGVF STEDGFKYFA PANTLDENLE
1921 GEAFIDFTGKL IIDENIYYFE DNYRGAVEWK ELDGEMHYFS PETGKAFKGL NQIGDDKYYF
1981 NSDGMQKGF VSINDNKHYF DDSGVMKVG Y TEIDGKHFFY AENGEMQIGV FNTEDGFKYF
2041 AHNEDLGNE EGEEISYSGI LNFNNKIYYF DDSFTAVVGW KDLEDGSKYY FDEDTAEAYI
2101 GLSLINDGQY YFNDDGIMQV GFVTINDKVF YFSDSGIIES GVQNIDDNYF YIDDNGIVQI
2161 GVFDTSQGYK YFAPANTVND NIYQAVEYS GLVRVGEDVY YFGETYTIET GWIYDMENES
2221 DKYYFVPETK KACKGINLID DIKYYFDEKG IMRTGLISFE NNNYYFNENG EIQFGYINIE
2281 DKMFYFGEDG VMQIGVFNTP DGFKYFAHQN TLDENFEGES INYTGWLGLD EKRYFTDEY
2341 IAATGSVIID GEEYFDPDT AQLVISE

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