

Product Data Sheet

Product Name: Cholera toxin (cholera toxin)

Cat. No.: GC31655

Chemical Properties

Cas. No. 9012-63-9

SMILES [Cholera toxin]

Formula M.Wt

Solubility When reconstituted to 0.5 ml with water, the buffer is 0.05 M Tris, 0.2 M NaCl, 0.001 M Na₂EDTA at pH 7.5

Storage Store at 4°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available sizes: ship with RT, or blue ice upon request.

Structure

Cholera toxin

Protocol

Cell experiment [1]:

Cell lines Jurkat cells

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

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Cells were incubated for 3 h with medium alone or with Cholera toxin (0.5 ug/ml) Preparation Method in medium. After washing the cells the expression of the indicated antigen on the cell surface was measured by FCM analysis.

Reaction Conditions 0.5ug/ml;3h

Applications Cholera toxin treatment of Jurkat cells for 3 h caused a nearly total disappearance of the TcR complex from the surface of the cell.

References:

[1]. Nunes J, Bagnasco M, et.al. Cholera toxin inhibits the increase in cytoplasmic free calcium induced via the CD2 pathway of human T-lymphocyte activation. J Cell Biochem. 1989 Apr;39(4):391-400. doi: 10.1002/jcb.240390405. PMID: 2542344.

Background

Cholera toxin (cholera toxin) is an enterotoxigenic protein complex consisting of a single A subunit (cholera toxin A subunit (CTA)) and a pentamer of B subunits (cholera toxin B subunit (CTB)). It enters the host cell by binding to ganglioside GM1 on the plasma membrane and retrograde into the endoplasmic reticulum via the trans-Golgi network[1-3].

Cholera toxin(0.5ug/ml;3h) treatment of Jurkat cells for 3 h caused a nearly total disappearance of the TcR complex from the surface of the cell[4,5]. Cholera toxin enters host intestinal epithelial cells, and its retrograde transport to the cytosol results in the massive loss of fluids and electrolytes associated with severe dehydration[6]. Cholera toxin activates adenylate cyclase by catalyzing ADP-ribosylation of Gs alpha, the stimulatory guanine nucleotide-binding protein[7].

References:

- [1]. van Heyningen S. Cholera toxin. Biol Rev Camb Philos Soc. 1977 Nov;52(4):509. doi: 10.1111/j.1469-185x.1977.tb00858.x. PMID: 203347.
- [2]. Wernick NL, Chinnapen DJ, et.al. Cholera toxin: an intracellular journey into the cytosol by way of

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the endoplasmic reticulum. Toxins (Basel). 2010 Mar;2(3):310-25. doi: 10.3390/toxins2030310. Epub 2010 Mar 5. PMID: 22069586; PMCID: PMC3153193.

[3]. Kellner A, Taylor M, et,al. A binding motif for Hsp90 in the A chains of ADP-ribosylating toxins that move from the endoplasmic reticulum to the cytosol. Cell Microbiol. 2019 Oct;21(10):e13074. doi: 10.1111/cmi.13074. Epub 2019 Jul 5. PMID: 31231933; PMCID: PMC6744307.

[4]. Sommermeyer H, Schwinzer R,et,al. Cholera toxin modulates the T cell antigen receptor/CD3 complex but not the CD2 molecule and inhibits signaling via both receptor structures in the human T cell lymphoma Jurkat. Eur J Immunol. 1989 Dec;19(12):2387-90. doi: 10.1002/eji.1830191232. PMID: 2575034.

[5]. Nunes J, Bagnasco M, et,al. Cholera toxin inhibits the increase in cytoplasmic free calcium induced via the CD2 pathway of human T-lymphocyte activation. J Cell Biochem. 1989 Apr;39(4):391-400. doi: 10.1002/jcb.240390405. PMID: 2542344.

[6]. Wands AM, Cervin J, et,al. Fucosylated Molecules Competitively Interfere with Cholera Toxin Binding to Host Cells. ACS Infect Dis. 2018 May 11;4(5):758-770. doi: 10.1021/acsinfecdis.7b00085. Epub 2018 Feb 22. PMID: 29411974; PMCID: PMC5948155.

[7]. Tsai SC, Noda M, et,al. Stimulation of cholera toxin enzymatic activities by GTP and two soluble proteins purified from bovine brain. J Biol Chem. 1988 Feb 5;263(4):1768-72. PMID: 3123477.

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