

Cya A (2F5): sc-80006

BACKGROUND

Bordetella pertussis, the causative agent of whooping cough, secretes several toxins implicated in this disease. One of these putative virulence factors is the adenylate cyclase toxin (Cya A or ACT), which elevates intracellular cAMP in eukaryotic cells to cytotoxic levels upon activation by endogenous calmodulin. The *Bordetella pertussis* Cya toxin-encoding locus (Cya) is composed of five genes. The Cya A gene encodes a virulence factor, Cya A, exhibiting adenylate cyclase, hemolytic and invasive activities. Cya A is related to the RTX (repeats in toxin) family of pore-forming toxins. Like all RTX toxins, Cya A is synthesized as a protoxin (proCya A) encoded by the *cyaA* gene. Activation to the mature cell-invasive toxin involves palmitoylation of Lysine 983 and is dependent on co-expression of Cya C. The Cya B, D and E gene products are necessary for Cya A transport, and the Cya C gene product is required to activate Cya A. Additionally, Cya A uses the α M β 2 Integrin (CD11b/CD18) as a cell receptor. Thus, the cellular distribution of CD11b, mostly on neutrophils, macrophages, and dendritic and natural killer cells, supports a role for Cya A in disrupting the early, innate antibacterial immune response.

REFERENCES

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2. Gross, M.K., Au, D.C., Smith, A.L. and Storm, D.R. 1992. Targeted mutations that ablate either the adenylate cyclase or hemolysin function of the bifunctional Cya A toxin of *Bordetella pertussis* abolish virulence. *Proc. Natl. Acad. Sci. USA* 89: 4898-4902.
3. Ehrmann, I.E., Weiss, A.A., Goodwin, M.S., Gray, M.C., Barry, E. and Hewlett, E.L. 1992. Enzymatic activity of adenylate cyclase toxin from *Bordetella pertussis* is not required for hemolysis. *FEBS Lett.* 304: 51-56.
4. Westrop, G.D., Hormozi, E.K., Da Costa, N.A., Parton, R. and Coote, J.G. 1996. *Bordetella pertussis* adenylate cyclase toxin: proCya A and Cya C proteins synthesised separately in *Escherichia coli* produce active toxin *in vitro*. *Gene* 180: 91-99.
5. Guermonprez, P., Khelef, N., Blouin, E., Rieu, P., Ricciardi-Castagnoli, P., Guiso, N., Ladant, D. and Leclerc, C. 2001. The adenylate cyclase toxin of *Bordetella pertussis* binds to target cells via the α M β 2 Integrin (CD11b/CD18). *J. Exp. Med.* 193: 1035-1044.

SOURCE

Cya A (2F5) is a mouse monoclonal antibody raised against adenylate cyclase toxin of *Bordetella pertussis* origin.

PRODUCT

Each vial contains 200 μ g IgG₁ in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

STORAGE

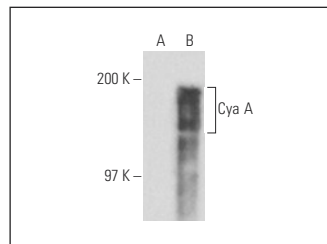
Store at 4° C, ****DO NOT FREEZE****. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

APPLICATIONS

Cya A (2F5) is recommended for detection of Cya A of *B. pertussis* origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)].

Molecular Weight of Cya A: 233 kDa.

DATA




Cya A (2F5): sc-80006. Western blot analysis of *Bordetella pertussis* Adenylate Cyclase Toxin.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.



See **Cya A (3D1): sc-13582** for Cya A antibody conjugates, including AC, HRP, FITC, PE, Alexa Fluor® 488 and Alexa Fluor® 647.