

Cya A (3D1): sc-13582

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.

SOURCE

Cya A (3D1) is a mouse monoclonal antibody raised against amino acids 1-400 of *Bordetella pertussis* adenylate cyclase toxin origin.

PRODUCT

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

Cya A (3D1) is available conjugated to agarose (sc-13582 AC), 500 μ g/0.25 ml agarose in 1 ml, for IP; to HRP (sc-13582 HRP), 200 μ g/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-13582 PE), fluorescein (sc-13582 FITC), Alexa Fluor[®] 488 (sc-13582 AF488), Alexa Fluor[®] 546 (sc-13582 AF546), Alexa Fluor[®] 594 (sc-13582 AF594) or Alexa Fluor[®] 647 (sc-13582 AF647), 200 μ g/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor[®] 680 (sc-13582 AF680) or Alexa Fluor[®] 790 (sc-13582 AF790), 200 μ g/ml, for Near-Infrared (NIR) WB, IF and FCM.

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APPLICATIONS

Cya A (3D1) 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.

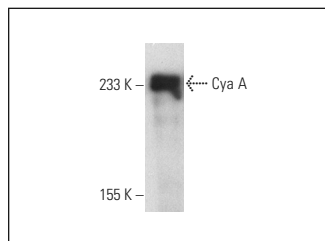
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker[™] Molecular Weight Standards: sc-2035, UltraCruz[®] Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml).

STORAGE

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

DATA



Cya A (3D1): sc-13582. Western blot analysis of authentic adenylate cyclase toxin.

SELECT PRODUCT CITATIONS

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- Ramos-Morales, F., et al. 2015. Generation and use of site-directed chromosomal *cyaA* translational fusions in *Salmonella enterica*. *Methods Mol. Biol.* 1225: 93-104.
- Salvo, E., et al. 2016. Interaction of *Bacillus subtilis* polynucleotide phosphorylase and RNase Y: structural mapping and effect on mRNA turnover. *J. Biol. Chem.* 291: 6655-6663.
- Houot, L., et al. 2017. Electrostatic interactions between the CTX phage minor coat protein and the bacterial host receptor TolA drive the pathogenic conversion of *Vibrio cholerae*. *J. Biol. Chem.* 292: 13584-13598.
- Mary, C., et al. 2018. Interaction via the N terminus of the type IV secretion system (T4SS) protein VirB6 with VirB10 is required for VirB2 and VirB5 incorporation into T-pili and for T4SS function. *J. Biol. Chem.* 293: 13415-13426.
- Germain, E., et al. 2019. YtfK activates the stringent response by triggering the alarmone synthetase SpoT in *Escherichia coli*. *Nat. Commun.* 10: 5763.
- Kim, H., et al. 2020. Structural basis for effector protein recognition by the Dot/Icm Type IVB coupling protein complex. *Nat. Commun.* 11: 2623.
- Harwood, T.V., et al. 2021. The cyanobacterial taxis protein HmpF regulates type IV pilus activity in response to light. *Proc. Natl. Acad. Sci. USA* 118: e2023988118.
- Sharma, D.K., et al. 2022. Characterization of DNA processing protein A (DprA) of the radiation-resistant bacterium *Deinococcus radiodurans*. *Microbiol. Spectr.* 10: e0347022.

RESEARCH USE

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