

cya and lef bind to pagA(197-794):ANTXR2 oligomer

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

- Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics*, 18, 142. [↗](#)
- Sidiropoulos, K., Viteri, G., Sevilla, C., Jupe, S., Webber, M., Orlic-Milacic, M. et al. (2017). Reactome enhanced pathway visualization. *Bioinformatics*, 33, 3461-3467. [↗](#)
- Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res*, 46, D649-D655. [↗](#)
- Fabregat, A., Korninger, F., Viteri, G., Sidiropoulos, K., Marin-Garcia, P., Ping, P. et al. (2018). Reactome graph database: Efficient access to complex pathway data. *PLoS computational biology*, 14, e1005968. [↗](#)

Reactome database release: 88

This document contains 1 reaction ([see Table of Contents](#))

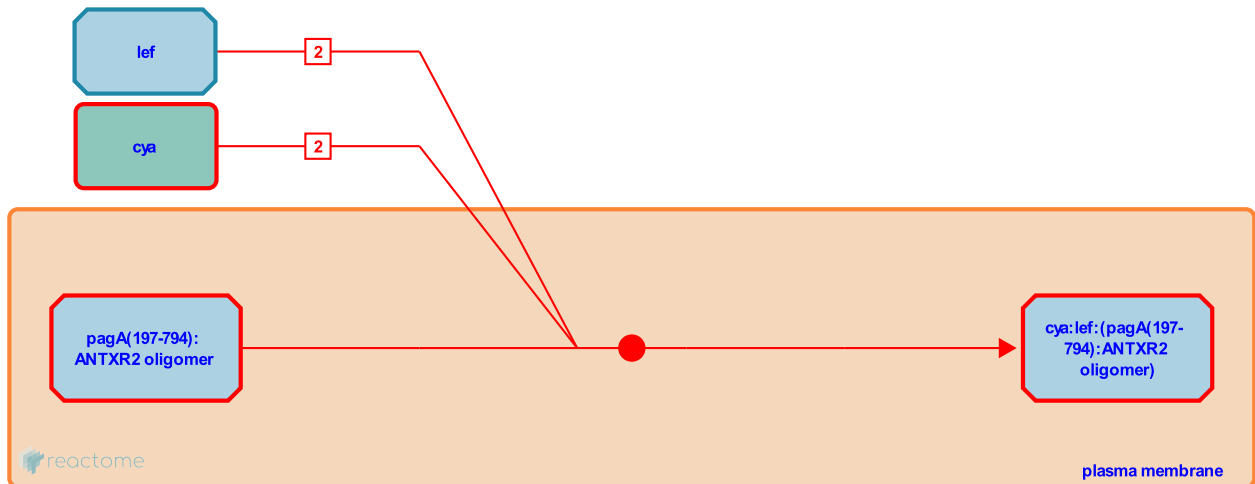
cya and lef bind to pagA(197-794):ANTXR2 oligomer ↗

Stable identifier: R-HSA-5210892

Type: binding

Compartments: extracellular region, plasma membrane

Diseases: anthrax disease



The enzyme components of anthrax toxins cya (also known as EF, Edema Factor - Robertson et al. 1988) and lef (also known as LF, Lethal Factor - Bragg & Robertson 1989; Klimpel et al. 1994) bind to pagA(197-794):ANTXR2 (protective antigen, large fragment: Anthrax receptor 2) oligomers on the target cell surface. Binding of the two toxins to an oligomer is competitive and as many as four toxin molecules can bind to one oligomer (Elliott et al. 2000; Pimental et al. 2004).

Literature references

- Krantz, BA., Pimental, RA., Collier, RJ., Christensen, KA. (2004). Anthrax toxin complexes: heptameric protective antigen can bind lethal factor and edema factor simultaneously. *Biochem. Biophys. Res. Commun.*, 322, 258-62. ↗
- Klimpel, KR., Leppla, SH., Arora, N. (1994). Anthrax toxin lethal factor contains a zinc metalloprotease consensus sequence which is required for lethal toxin activity. *Mol. Microbiol.*, 13, 1093-100. ↗
- Mogridge, J., Elliott, JL., Collier, RJ. (2000). A quantitative study of the interactions of Bacillus anthracis edema factor and lethal factor with activated protective antigen. *Biochemistry*, 39, 6706-13. ↗
- Robertson, DL., Leppla, SH., Tippetts, MT. (1988). Nucleotide sequence of the Bacillus anthracis edema factor gene (cya): a calmodulin-dependent adenylate cyclase. *Gene*, 73, 363-71. ↗
- Robertson, DL., Bragg, TS. (1989). Nucleotide sequence and analysis of the lethal factor gene (lef) from Bacillus anthracis. *Gene*, 81, 45-54. ↗

Editions

2013-12-13	Authored	D'Eustachio, P.
2014-05-19	Reviewed	Leppla, SH.
2014-05-23	Reviewed	Turk, BE.
2014-05-28	Reviewed	Moayeri, M., Liu, S.