

# botF HC:LC binds SV2A or B or C and GT1b on the target cell surface

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03/05/2024

## 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.

The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

## 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](#))

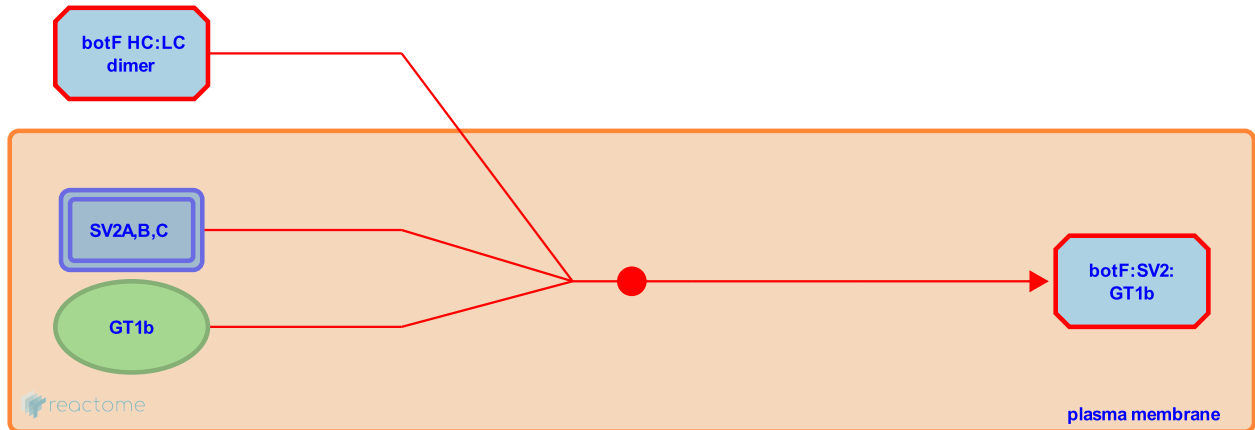
## botF HC:LC binds SV2A or B or C and GT1b on the target cell surface [↗](#)

**Stable identifier:** R-HSA-5250880

**Type:** binding

**Compartments:** extracellular region, plasma membrane

**Diseases:** botulism



The botulinum toxin type F disulfide-bonded heavy chain - light chain heterodimer ("dichain") (botF HC:LC, encoded by the *C. botulinum botF* gene) binds ganglioside GT1b and synaptic vesicle protein 2A (SV2A), B (SV2B), or C (SV2C) on the plasma membrane of a human target cell. In vivo, this process specifically targets synapses at neuromuscular junctions, where toxin association with ganglioside may position it to bind efficiently to SV2A, B, or C when those proteins are exposed at the cell surface by exocytosis (Fu et al. 2009; Rummel et al. 2009).

### Literature references

Mahrhold, S., Darashchonak, N., Häfner, K., Rummel, A., Holt, M., Binz, T. et al. (2009). Botulinum neurotoxins C, E and F bind gangliosides via a conserved binding site prior to stimulation-dependent uptake with botulinum neurotoxin F utilising the three isoforms of SV2 as second receptor. *J. Neurochem.*, *110*, 1942-54. [↗](#)

Baldwin, MR., Barbieri, JT., Chen, C., Kim, JJ., Fu, Z. (2009). Glycosylated SV2 and gangliosides as dual receptors for botulinum neurotoxin serotype F. *Biochemistry*, *48*, 5631-41. [↗](#)

### Editions

2006-06-15	Authored	Gopinathrao, G., Krupa, S.
2007-08-03	Reviewed	Ichtchenko, K.
2014-02-11	Revised	D'Eustachio, P.
2014-11-18	Reviewed	Sharma, S., Thirunavukkarasu, N.