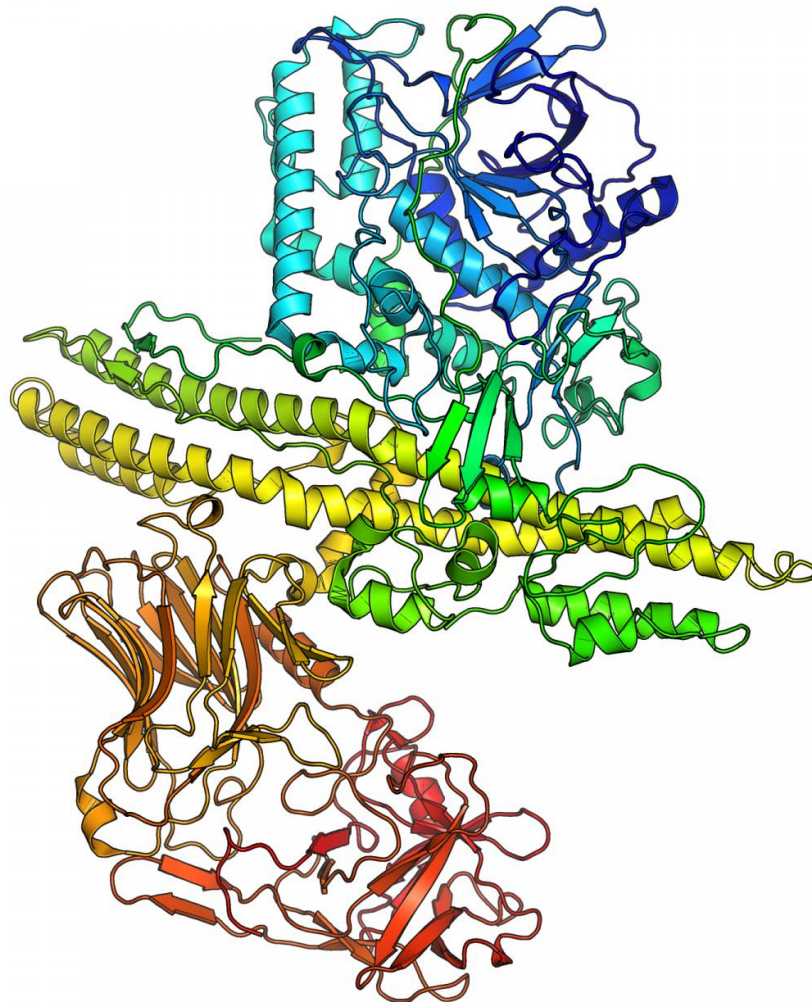


New botulinum neurotoxin discovered—potential to treat a number of medical conditions

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Structure of the first botulinum neurotoxin (BoNT/A) discovered in 1897.
Credit: Pål Stenmark

Botulinum toxins are currently applicable in more than 80 medical conditions including muscle spasms, overactive bladder, chronic migraine, cervical dystonia, sweating and cerebral palsy (CP). A new toxin, Botulinum neurotoxin type X (BoNT/X), has the potential to open up a new field of toxin therapeutics related to intracellular membrane trafficking and secretion.

Since Botulinum neurotoxins are the most toxic substances known, the development of detection methods and treatments is very important. "The discovery of BoNT/X facilitates the development of diagnostics and countermeasures, which is important for someone exposed to a toxic amount of the substance," says Pal Stenmark, associate professor, Department of Biochemistry and Biophysics, Stockholm University.

The research team will now develop antibodies with the ability to detect and inactivate the [toxin](#). "Within a few months, we will have developed ways of detecting if a person has been subject to BoNT/X," says Pal Stenmark. The researchers will determine the structure of the toxin and investigate how it binds to the nerve cell. They will also investigate how the unique properties of BoNT/X can be used to develop new therapeutics.

BoNT/X was discovered when an infant in Japan became ill in 1995. In 2015, the genome of the bacteria isolated from the child was sequenced and deposited in a database. Hidden in the 4-million-letter blueprint of the bacterium, the research team identified the novel toxin.

"When we first discovered this toxin, I believed we had made some error in the analysis, but after checking several times, it turned out to be correct. This discovery opens a multitude of exciting research topics that we are eager to explore in collaboration with Dr. Min Dong's research team at Harvard," says Pal Stenmark.

More information: "Identification and characterization of a novel botulinum neurotoxin" *Nature Communications*, [DOI: 10.1038/NCOMMS14130](https://doi.org/10.1038/NCOMMS14130)

Provided by Stockholm University

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