

Method and Compositions for Detecting Botulinum Neurotoxin

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method for the sensitive detection of botulinum neurotoxin both *in vitro* and in living cells.

OVERVIEW

Botulinum neurotoxins produced by *Clostridium botulinum* are the most potent toxins known. Because of the threat of bio-terrorism, sensitive methods for detecting botulinum neurotoxin are needed; however, current detection methods are expensive, time-consuming and complicated.

THE INVENTION

UW-Madison researchers have developed a fluorescence resonance energy transfer (FRET) method for the sensitive detection of botulinum neurotoxin. The assay uses two fluorescent proteins, such as cyan fluorescent protein (CFP) and yellow fluorescent protein (YFP), which are linked together by a molecule that can be recognized and cleaved by botulinum neurotoxin. The emission spectrum of CFP partially overlaps with that of YFP. As a result, when CFP and YFP are very close together, excitation of CFP results in FRET-YFP emission and partial quenching of CFP emission. When botulinum neurotoxin cleaves the linker molecule separating these two fluorescent proteins, FRET is eliminated, i.e., excitation of CFP no longer results in YFP emission and partial quenching of CFP emission.

To detect botulinum neurotoxin, a sample is exposed to the CFP and YFP construct. The FRET signals are measured and compared before and after exposure, with a decrease in FRET after exposure indicating the toxin's presence. This method is useful for detecting botulinum toxin both *in vitro* and in living cells.



THE WARF ADVANTAGE

WARF: A Leader in Technology Transfer Since 1925

Since its founding as a private, nonprofit affiliate of the University of Wisconsin-Madison, WARF has provided patent and licensing services to UW-Madison and worked with commercial partners to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

The University of Wisconsin and WARF – A Single Location to Accelerate Translational Development of New Drugs

UW-Madison has the integrative capabilities to complete many key components of the drug development cycle, from discovery through clinical trials. As one of the top research universities in the world, and one of the two best-funded universities for research in the country, UW-Madison offers state-of-the-art facilities unmatched by most public universities.

These include the Small Molecule Screening Facility at the UW Comprehensive Cancer Center; the Zeeh Pharmaceutical Experiment Station, which provides consulting and laboratory services for developing formulations and studying solubility, stability and more; the Waisman Clinical Biomanufacturing Facility; the Wisconsin Institute for Medical Research, which provides UW-Madison with a complete translational research facility; and the innovative, interdisciplinary Wisconsin Institutes for Discovery, home to the private, nonprofit Morgridge Institute for Research and its public twin, WID, part of the university's graduate school. The highly qualified experts at these facilities are ready to work with you to create a library of candidates for drug development.

APPLICATIONS

- Provides an *in vitro* sensor for botulinum neurotoxin
- Assaying the entry of the toxin into living cells
- Cell-based screening of botulinum neurotoxin inhibitors

KEY BENEFITS

- Highly sensitive: detects botulinum neurotoxin at the picomolar level
- Amenable to high throughput automated screening
- Valuable in the defense industry as well as for civilian bioterrorism prevention

ADDITIONAL INFORMATION

Tech Fields

Diagnostic Assays - Pathogens

Research Tools - Detection

Analytical Instrumentation - Biodefense

CONTACT INFORMATION

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or 608-960-9847.

