

What is claimed is:

**1.** A proteolytic toxin assay comprising the steps of:

- (a) combining a test compound with a substrate and antibody, either sequentially or simultaneously, wherein the substrate has a cleavage site for a toxin and when cleaved by the toxin forms a product, wherein the antibody binds to the substrate but not to the product; and,  
 (b) detecting the presence of antibody bound to the substrate.

**2.** The assay of claim **1**, wherein the substrate is within a cell.

**3.** The assay of claim **1**, wherein the substrate is attached to a solid phase assay component.

**4.** The assay of claim **1**, wherein the substrate is an intact peptide or fragment thereof selected from the group consisting of VAMP, a VAMP analog, a VAMP isoform, SNAP-25, a SNAP-25 analog, a SNAP-25 isoform, syntaxin, a syntaxin analog; and, a syntaxin isoform.

**5.** The assay of claim **1**, wherein said antibody binds selectively to a peptide having a sequence selected from the group consisting of:

RIDEANQRATKMLGSG; (SEQ ID NO: 1)

DEANQRATKMLGSG;  
 and, (SEQ ID NO: 2)

RIDEANQRATKMLG. (SEQ ID NO: 3)

**6.** The assay of claim **1**, wherein the antibody is detected using a nitrocellulose membrane.

**7.** The assay of claim **1**, wherein the antibody is detected using a solid-phase component selected from the group consisting of diazocellulose, glass, polystyrene, polyvinylchloride, polypropylene, polyethylene, dextran, nylon, starch or affinity support gels such as Sepharose and agar.

**8.** The assay of claim **1**, wherein the antibody is detected using an immunohistochemical label selected from a group consisting of a reporter enzyme, a radioisotope, a fluorescent compound, a chemiluminescent compound; and, a bioluminescent compound.

**9.** The assay of claim **1**, wherein the antibody is detected using a secondary antibody.

**10.** The assay of claim **1**, wherein the antibody is detected using high-resolution immunofluorescence imaging.

**11.** The assay of claim **1**, wherein the antibody is detected using low-resolution immunofluorescence imaging.

**12.** The assay of claim **1**, wherein the antibody is detected by at least one primary screen comprising of a low-resolution BAGS immunofluorescence assay, followed by at least one secondary screen comprising of a high-resolution BAGS immunofluorescence assay.

**13.** A proteolytic toxin assay comprising the steps of:

- (a) combining a test compound with a substrate and antibody, either sequentially or simultaneously, wherein the substrate has a cleavage site for a toxin and when cleaved by the toxin forms a product, wherein the antibody binds to the substrate but not to the product;  
 (b) detecting the presence of antibody bound to the substrate; and,  
 (c) using a normalized response to detect a decreased antibody signal.

**14.** The assay of claim **13**, wherein the normalized response is calculated as a ratio between levels of full-length substrate and total substrate.

**15.** An antibody wherein said antibody binds to a target protein selected from a group consisting of VAMP, a VAMP analog, a VAMP isoform, SNAP-25, a SNAP-25 analog, a SNAP-25 isoform, syntaxin, a syntaxin analog; and, a syntaxin isoform; or a fragment thereof; but does not bind to said target protein after proteolysis by a toxin, and wherein said antibody comprises epitopes spanning the scissile bond of the target protein.

**16.** The antibody of claim **15**, wherein said epitopes are specific for a peptide selected from a group consisting of SEQ ID NOS: 1-3.

**17.** A method of obtaining an antibody, said method comprising identifying at least one antigenic peptide that corresponds to a substrate site for toxin proteolytic activity, synthesizing said one antigenic peptide, immunizing an animal against said one antigenic peptide, isolating antibodies that bind to said one antigenic peptide and recovering antibody that does not cross-react with products of said proteolytic activity.

**18.** The method of claim **17**, wherein said one antigenic peptide is selected from a group consisting of SEQ ID NOS: 1-3.

**19.** The method of claim **17**, wherein said substrate is selected from a group consisting of VAMP, a VAMP analog, a VAMP isoform, SNAP-25, a SNAP-25 analog, a SNAP-25 isoform, syntaxin, a syntaxin analog; and, a syntaxin isoform; or a fragment thereof.

**20.** A kit comprising at least one carrier means operative to store at least one container means, said container means further comprising a first container means for storing antibodies with a specific binding affinity for the scissile bond of a toxin target substrate and a second container means for storing a target substrate.

**21.** The kit of claim **20**, further comprising a third container means for storing standard concentration of toxin.

**22.** The kit of claim **20**, further comprising a container means for storing an antibody with affinity to the target substrate that is not sensitive to the proteolytic activity of said toxin on said target substrate.

**23.** The assay of claim **2**, wherein the substrate is an intact peptide or fragment thereof selected from the group consisting of VAMP, a VAMP analog, a VAMP isoform, SNAP-25, a SNAP-25 analog, a SNAP-25 isoform, syntaxin, a syntaxin analog; and, a syntaxin isoform.

**24.** The assay of claim **2**, wherein said antibody binds selectively to a peptide having a sequence selected from the group consisting of:

RIDEANQRATKMLGSG; (SEQ ID NO: 1)

DEANQRATKMLGSG;  
 and, (SEQ ID NO: 2)

RIDEANQRATKMLG. (SEQ ID NO: 3)

**25.** The assay of claim **2**, wherein the antibody is detected using a secondary antibody.

**26.** The assay of claim **2**, wherein the antibody is detected using high-resolution immunofluorescence imaging.