We claim:

1. The isolated and purified nucleic acid sequence identified as SEQ ID NO: 15.

2. The nucleic acid of claim 1, further comprising an expression control sequence operably linked to said nucleic acid sequence.

3. A method of preparing a polypeptide comprising the carboxy-terminal portion of the heavy chain of a botulinum neurotoxin serotype F, said method comprising

transfecting an organism with the nucleic acid sequence of claim 1,

culturing the transfected organism under conditions wherein the carboxy-terminal portion of the heavy chain of the botulinum neurotoxin is expressed, and the polypeptide is produced from the nucleic acid wherein the organism is selected from the group consisting of a gram negative bacterium, a yeast cell, and a cell of a mammalian cell line, and

recovering said polypeptide from said transfected organism.

4. The method of claim 3 wherein said organism is *Escherichia coli.*

5. The method of claim 3 wherein said organism is *Pichia pastoris.*

6. The nucleic acid of claim 1, wherein the A+T content is less than about 70% of the total base composition.

7. The nucleic acid of claim 1, wherein the A+T content is less than about 60% of the total base composition.

8. A recombinant host cell comprising the nucleic acid of claim 1.

9. The recombinant host cell of claim 8, wherein expression of said nucleic acid in said host cell produces a protein comprising the heavy chain of a botulinum neurotoxin serotype F.

10. The recombinant host cell of claim 9, wherein said protein elicits an ELISA response to a botulinum neurotoxin serotype in an animal, said ELISA response being detectable upon about 100-fold dilution of serum from said animal.

11. The nucleic acid of claim 2 wherein said expression control sequence is a promoter.

12. The nucleic acid of claim 2 wherein said expression control sequence is an enhancer.

13. The nucleic acid of claim 1 wherein said nucleic acid is capable of being expressed in an organism selected from the group consisting of a gram negative bacterium, a yeast cell, and a cell of a mammalian cell line.

14. The nucleic acid of claim 13, wherein the gram negative bacteria is *Escherichia coli.*

15. The nucleic acid of claim 13, wherein the yeast is *Pichia pastoris.*

16. The recombinant host cell of claim 8 wherein said host cell is selected from the group consisting of a gram negative bacterium, a yeast cell, and a cell of a mammalian cell line.

17. The recombinant host cell of claim 16 wherein said gram negative bacteria is *Escherichia coli.*

18. The recombinant host cell of claim 16 wherein said yeast cell is *Pichia pastoris.*

19. The recombinant host cell of claim 10, wherein said protein is at least 0.75% (w/w) of the total cellular protein.

20. The recombinant host cell of claim 11, wherein said protein is at least 20% (w/w) of the total cellular protein.

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