CLAIMS

1. An immunogenic composition comprising at least two of:

a) a first polypeptide comprising a first amino acid sequence, wherein the first amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:1 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:1 or from a sequence having at least 90% sequence identity to SEQ ID NO:1;

b) a second polypeptide comprising a second amino acid sequence, wherein the second amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:2 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:2 or from a sequence having at least 90% sequence identity to SEQ ID NO:2;

c) a third polypeptide comprising a third amino acid sequence, wherein the third amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:3 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:3 or from a sequence having at least 90% sequence identity to SEQ ID NO:3;

d) a fourth polypeptide comprising a fourth amino acid sequence, wherein the fourth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:4 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:4 or from a sequence having at least 90% sequence identity to SEQ ID NO:4;

e) a fifth polypeptide comprising a fifth amino acid sequence, wherein the fifth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:5 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:5 or from a sequence having at least 90% sequence identity to SEQ ID NO:5; and/or

f) a sixth polypeptide comprising a sixth amino acid sequence, wherein the sixth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:6 and/or (ii) consisting of a fragment of at least 7 contiguous

amino acids from SEQ ID NO:6 or from a sequence having at least 90% sequence identity to SEQ ID NO:6; and/or

g) a seventh polypeptide comprising a seventh amino acid sequence, wherein the seventh amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:7 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:7 or from a sequence having at least 90% sequence identity to SEQ ID NO:7.

2. A polypeptide comprising at least two of:

a) a first polypeptide comprising a first amino acid sequence, wherein the first amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:1 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:1 or from a sequence having at least 90% sequence identity to SEQ ID NO:1;

b) a second polypeptide comprising a second amino acid sequence, wherein the second amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:2 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:2 or from a sequence having at least 90% sequence identity to SEQ ID NO:2;

c) a third polypeptide comprising a third amino acid sequence, wherein the third amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:3 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:3 or from a sequence having at least 90% sequence identity to SEQ ID NO:3;

d) a fourth polypeptide comprising a fourth amino acid sequence, wherein the fourth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:4 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:4 or from a sequence having at least 90% sequence identity to SEQ ID NO:4;

e) a fifth polypeptide comprising a fifth amino acid sequence, wherein the fifth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence

identity to SEQ ID NO:5 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:5 or from a sequence having at least 90% sequence identity to SEQ ID NO:5; and/or

f) a sixth polypeptide comprising a sixth amino acid sequence, wherein the sixth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:6 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:6 or from a sequence having at least 90% sequence identity to SEQ ID NO:6; and/or

g) a seventh polypeptide comprising a seventh amino acid sequence, wherein the seventh amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:7 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:7 or from a sequence having at least 90% sequence identity to SEQ ID NO:7.

3. A polypeptide comprising amino acid sequence:

$$A\text{-}\{\text{-}X\text{-}L\text{-}\}_n\text{-}B$$

wherein: each X is an amino acid sequence of first polypeptide, second polypeptide, third polypeptide, fourth polypeptide, fifth polypeptide, sixth polypeptide, or seventh polypeptide as defined in claim 1 and wherein each X is a different polypeptide; L is an optional linker amino acid sequence; A is an optional N terminal amino acid sequence; B is an optional C terminal amino acid sequence; n is an integer of 2 or more.

4. An immunogenic composition or a polypeptide according to any one of claims 1 to 3 wherein the first polypeptide comprises a first amino acid sequence consisting of a fragment of SEQ ID NO:1 comprising the amino acid sequence of SEQ ID NO:10 (D3), SEQ ID NO:36 (D3 sub-fragment), SEQ ID NO: 51 (D3+D4H) or SEQ ID NO:53 (D2+D3+D4H).

5. An immunogenic composition or a polypeptide according to any one of claims 1 to 4, wherein the second polypeptide comprises a second amino acid sequence consisting of a fragment of SEQ ID NO:2 comprising the amino acid sequence of SEQ ID NO:14 (D3),

SEQ ID NO:38 (D3 sub-fragment), SEQ ID NO:55 (D3+D4H) or SEQ ID NO:57 (D2+D3+D4H).

6. An immunogenic composition or a polypeptide according to any one of claims 1 to 5, wherein the third polypeptide comprises a third amino acid sequence consisting of a fragment of SEQ ID NO:3 comprising the amino acid sequence of SEQ ID NO:18 (D3), SEQ ID NO:40 (D3 sub-fragment), SEQ ID NO:59 (D3+D4H) or SEQ ID NO:61 (D2+D3+D4H).

7. An immunogenic composition or a polypeptide according to any one of claims 1 to 6, wherein the fourth polypeptide comprises a fourth amino acid sequence consisting of a fragment of SEQ ID NO:4 comprising the amino acid sequence of SEQ ID NO:22 (D3), SEQ ID NO:42 (D3 sub-fragment), SEQ ID NO:63 (D3+D4H) or SEQ ID NO:65 (D2+D3+D4H).

8. An immunogenic composition or a polypeptide according to any one of claims 1 to 7, wherein the fifth polypeptide comprises a fifth amino acid sequence consisting of a fragment of SEQ ID NO:5 comprising the amino acid sequence of SEQ ID NO:26 (D3), SEQ ID NO:44 (D3 sub-fragment), SEQ ID NO:67 (D3+D4H) or SEQ ID NO:69 (D2+D3+D4H).

9. An immunogenic composition or a polypeptide according to any one of claims 1 to 8, wherein the sixth polypeptide comprises a sixth amino acid sequence consisting of a fragment of SEQ ID NO:6 comprising the amino acid sequence of SEQ ID NO:30 (D3), SEQ ID NO:46 (D3 sub-fragment), SEQ ID NO:71 (D3+D4H) or SEQ ID NO:73 (D2+D3+D4H).

10. An immunogenic composition or a polypeptide according to any one of claims 1 to 9, wherein the seventh polypeptide comprises a seventh amino acid sequence consisting of a fragment of SEQ ID NO:7 comprising the amino acid sequence of SEQ ID NO:34

(D3), SEQ ID NO:48 (D3 sub-fragment), SEQ ID NO:75 (D3+D4H) or SEQ ID NO:77 (D2+D3+D4H).

11. The polypeptide of claim 2 or claim 3, comprising an amino acid sequence selected from the group consisting of: SEQ ID NOs: 83, 84, 85, 86 and 87.

12. An immunogenic composition or a polypeptide according to any one of claims 1 to 11 for use in therapy.

13. An immunogenic composition or a polypeptide according to any one of claims 1 to 11 for use in treating or preventing disease and/or infection caused by GBS, including treating or preventing meningitis.

14. A method or treating or prevent disease and/or infection caused by GBS, preferably meningitis, in a mammal comprising administering an effective amount of an immunogenic composition or polypeptide according to any one of claims 1 to 11.

15. A bacterium which expresses at least two of:

a) a first polypeptide comprising a first amino acid sequence, wherein the first amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:1 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:1 or from a sequence having at least 90% sequence identity to SEQ ID NO:1;

b) a second polypeptide comprising a second amino acid sequence, wherein the second amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:2 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:2 or from a sequence having at least 90% sequence identity to SEQ ID NO:2;

c) a third polypeptide comprising a third amino acid sequence, wherein the third amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:3 and/or (ii) consisting of a fragment of at least 7 contiguous

amino acids from SEQ ID NO:3 or from a sequence having at least 90% sequence identity to SEQ ID NO:3;

d) a fourth polypeptide comprising a fourth amino acid sequence, wherein the fourth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:4 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:4 or from a sequence having at least 90% sequence identity to SEQ ID NO:4;

e) a fifth polypeptide comprising a fifth amino acid sequence, wherein the fifth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:5 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:5 or from a sequence having at least 90% sequence identity to SEQ ID NO:5; and/or

f) a sixth polypeptide comprising a sixth amino acid sequence, wherein the sixth amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:6 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:6 or from a sequence having at least 90% sequence identity to SEQ ID NO:6; and/or

g) a seventh polypeptide comprising a seventh amino acid sequence, wherein the seventh amino acid sequence comprises an amino acid sequence (i) having at least 90% sequence identity to SEQ ID NO:7 and/or (ii) consisting of a fragment of at least 7 contiguous amino acids from SEQ ID NO:7 or from a sequence having at least 90% sequence identity to SEQ ID NO:7.

Claims

1. An invention not claimed in any divisional application.