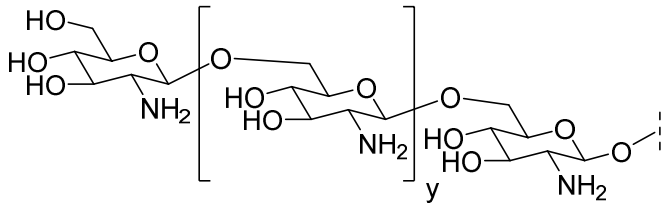
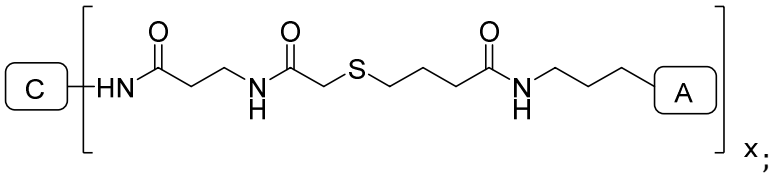
[0012] In one example, this disclosure provides for a vaccine against microbes comprising oligosaccharide β-(1→6)-glucosamine structures in their cell wall wherein said vaccine is represented by formula I:

$$(A\text{-}B)_x\text{-}C \quad I$$

where A comprises 3 to 12 β-(1→6)-glucosamine (carbohydrate ligand) groups or mixtures thereof wherein said oligosaccharide portion of the vaccine has the formula:



B is of the formula:



where A is as defined above and C is tetatus toxoid;

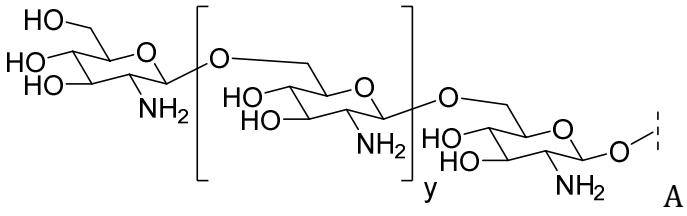
x is an integer from about 30 to about 39; and

y is an integer from 1 to 10.

[0012a] In one aspect, the present disclosure refers to use of a monoclonal antibody F-598 in the manufacture of a first medicament and use of a vaccine of formula I:

$$(A\text{-}B)_x\text{-}C \quad I$$

wherein A comprises 5 β-(1→6)-glucosamine (carbohydrate ligand) groups wherein said oligosaccharide portion of the vaccine is represented by formula A:



B is a linker ;

where A is as defined above and C is tetanus toxoid;

x is an integer from 30 to 39; and

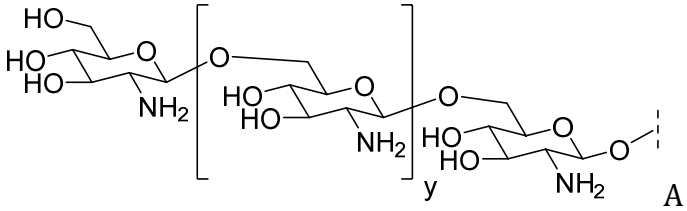
y is 3,

in the manufacture of a second medicament, wherein the first and second medicaments are to be used in combination therapy for providing continuous protection against poly-β-1,6-linked N-acetylglucosamine (PNAG)-based microbial infection in a patient.

[0012b] In another aspect, the present disclosure refers to use of a monoclonal antibody F-598 in the manufacture of a first medicament and use of a vaccine of formula I:

$$(A\text{-}B)_x\text{-}C \quad I$$

wherein A comprises 5 β-(1→6)-glucosamine (carbohydrate ligand) groups wherein said oligosaccharide portion of the vaccine is represented by formula A:



B is a linker ;

where A is as defined above and C is tetanus toxoid;

x is an integer from 30 to 39; and

y is an integer from 3,

in the manufacture of a second medicament, wherein the first and second medicaments are to be used in combination therapy for inhibiting poly-β-1,6-linked N-acetylglucosamine (PNAG)-based biofilm formation in a patient.

[0013] In one example, this disclosure provides for a vaccine against microbes comprising oligosaccharide β-(1→6)-glucosamine structures in their cell wall wherein said vaccine is represented by formula II:

$$(A'\text{-}B)_x\text{-}C \quad II$$

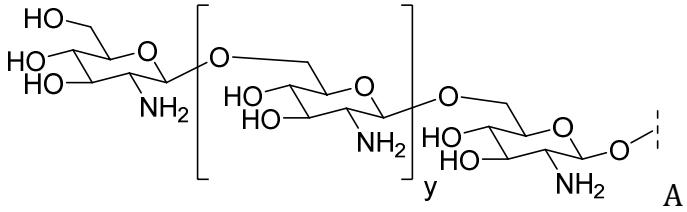
where A′ is a penta-β-(1→6)-glucosamine (carbohydrate ligand) group of the formula:

WHAT IS CLAIMED IS:

1. Use of a monoclonal antibody F-598 in the manufacture of a first medicament and use of a vaccine of formula I:

$$(A\text{-}B)_x\text{-}C \quad I$$

wherein A comprises 5 β-(1→6)-glucosamine (carbohydrate ligand) groups wherein said oligosaccharide portion of the vaccine is represented by formula A:



B is a linker ;

where A is as defined above and C is tetanus toxoid;

x is an integer from 30 to 39; and

y is 3,

in the manufacture of a second medicament, wherein the first and second medicaments are to be used in combination therapy for providing continuous protection against poly-β-1,6-linked N-acetylglucosamine (PNAG)-based microbial infection in a patient.

2. The use of claim 1, wherein the vaccine of formula I is to be administered concurrently with F-598.

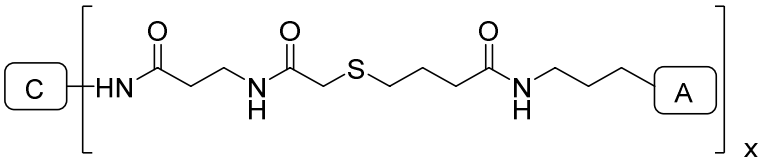
3. The use of claim 1, wherein the vaccine of formula I is to be administered within about 6 hours of administering F-598.

4. The use of claim 1, wherein the vaccine of formula I is to be administered within about 4 hours of administering F-598.

5. The use of claim 1, wherein the vaccine of formula I is to be administered within about 2 hours of administering F-598.

6. The use of claim 1, wherein F-598 is to be co-administered during an entire treatment period.

7. The use of claim 1, wherein the linker is represented by the formula:



where A and C are not included within the linker.

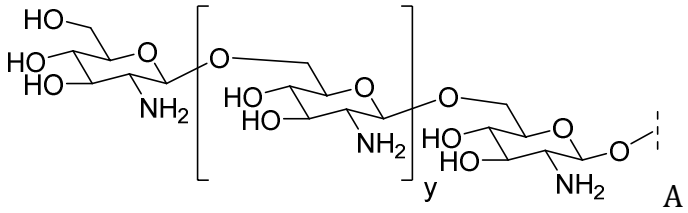
8. The use of claim 1, wherein F-598 is to be co-administered up until a point where sufficient antibody titer is produced by the vaccine of formula I to effectively treat the patient.

9. Use of the vaccine of claim 7 in the manufacture of a medicament for providing effective immunity to a subject from microbes comprising oligosaccharide β-(1→6)-glucosamine groups in their cell wall.

10. Use of a monoclonal antibody F-598 in the manufacture of a first medicament and use of a vaccine of formula I:

$$(A\text{-}B)_x\text{-}C \qquad I$$

wherein A comprises 5 β-(1→6)-glucosamine (carbohydrate ligand) groups wherein said oligosaccharide portion of the vaccine is represented by formula A:



B is a linker ;

where A is as defined above and C is tetanus toxoid;

x is an integer from 30 to 39; and

y is 3,

in the manufacture of a second medicament, wherein the first and second medicaments are to be used in combination therapy for inhibiting poly-β-1,6-linked N-acetylglucosamine (PNAG)-based biofilm formation in a patient.

11. The use of claim 10, wherein the vaccine of formula I is to be administered concurrently with F-598.

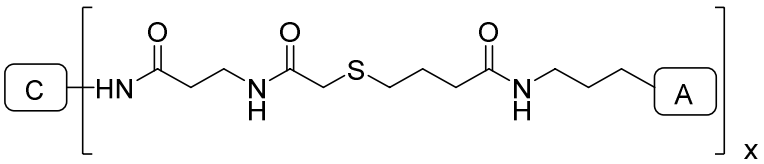
12. The use of claim 10, wherein the vaccine of formula I is to be administered within about 6 hours of administering F-598.

13. The use of claim 10, wherein the vaccine of formula I is to be administered within about 4 hours of administering F-598.

14. The use of claim 10, wherein the vaccine of formula I is to be administered within about 2 hours of administering F-598.

15. The use of claim 10, wherein F-598 is to be co-administered during an entire treatment period.

16. The use of claim 10, wherein the linker is represented by the formula:



where A and C are not included within the linker.

17. The use of claim 10, wherein F-598 is to be co-administered up until a point where sufficient antibody titer is produced by the vaccine of formula I to effectively treat the patient.

18. Use of the vaccine of claim 16 in the manufacture of a medicament for providing effective protection to a subject against biofilm formed by microbes comprising oligosaccharide β-(1→6)-glucosamine groups in their cell wall.