Claims

1. A composition comprising:

   (a) a glycoconjugate comprising a plurality of Globo H moieties covalently linked to one to twenty (n=1 to 20) single, monomeric keyhole limpet hemocyanin (KLH) moieties, wherein the Globo H moieties are covalently linked to the single, monomeric KLH moieties on one or more amino acid residues; and

   (b) an α-galactosyl-ceramide (α-GalCer) adjuvant,

wherein the composition has a glycoconjugate epitope ratio ranging from 750 to 3000, further wherein the glycoconjugate epitope ratio is defined as 20 x (actual Globo H moiety weight/Globo H moiety molecular weight)/(actual KLH moiety weight/KLH moiety molecular weight).

2. The composition of claim 1, wherein the amino acid residues are basic, neutral, hydrophobic amino acid residues and/or a combination thereof.

3. The composition of claim 1, wherein the amino acid residues are lysine, arginine, histidine, asparagine, proline, glutamine and/or a combination thereof.

4. The composition of claim 1, wherein the KLH is a monomer (n=1).

5. The composition of claim 1, wherein the KLH is a dimer (n=2).

6. The composition of claim 1, wherein the KLH is a trimer (n=3).

7. The composition of claim 1, wherein the KLH is a tetramer (n=4).

8. The composition of claim 1, wherein the KLH is a pentamer (n=5).

9. The composition of claim 1, wherein the KLH is a hexamer (n=6).

10. The composition of claim 1, wherein the KLH is a heptamer (n=7).

11. The composition of claim 1, wherein the KLH is an octamer (n=8).

12. The composition of claim 1, wherein the KLH is a nonamer (n=9).

13. The composition of claim 1, wherein the KLH is a decamer (n=10).

14. The composition of claim 1, wherein the KLH is an undecamer (n=11).

15. The composition of claim 1, wherein the KLH is a dodecamer (n=12).

16. The composition of claim 1, wherein the KLH is a tridecamer (n=13).

17. The composition of claim 1, wherein the KLH is a tetradecamer (n=14).

18. The composition of claim 1, wherein the KLH is a pentadecamer (n=15).

19. The composition of claim 1, wherein the KLH is a hexadecamer (n=16).

20. The composition of claim 1, wherein the KLH is a heptadecamer (n=17).

21. The composition of claim 1, wherein the KLH is an octadecamer (n=18).

22. The composition of claim 1, wherein the KLH is a nonadecamer (n=19).

23. The composition of claim 1, wherein the KLH is a didecamer (n=20).

24. The composition of claim 1, wherein the KLH are the same.

25. The composition of claim 1, wherein the KLH are different.

26. The composition of claim 1, wherein each KLH single, monomeric moiety has the same number of Globo H moieties.

27. The composition of claim 1, wherein each KLH single, monomeric moiety has a different number of Globo H moieties.

28. The composition of claim 1, wherein the Globo H moiety comprises (Fucα1→2 Galβ1→3 GalNAcβ1→3 Galα1→4 Galβ1→4 Glc).

29. The composition of claim 1, wherein the KLH is of SEQ ID NO. 1.

30. The composition of claim 1, wherein the KLH is at least 95% identical to a corresponding KLH moiety of SEQ ID NO. 1.

31. The composition of claim 1, wherein the KLH is at least 90% identical to a corresponding KLH moiety of SEQ ID NO. 1.

32. The composition of claim 1, wherein the KLH is at least 80% identical to a corresponding KLH moiety of SEQ ID NO. 1.

33. The composition of claim 1, wherein the KLH is of SEQ ID NO. 2.

34. The composition of claim 1, wherein the KLH is at least 95% identical to a corresponding KLH moiety of SEQ ID NO. 2.

35. The composition of claim 1, wherein the KLH is at least 90% identical to a corresponding KLH moiety of SEQ ID NO. 2.

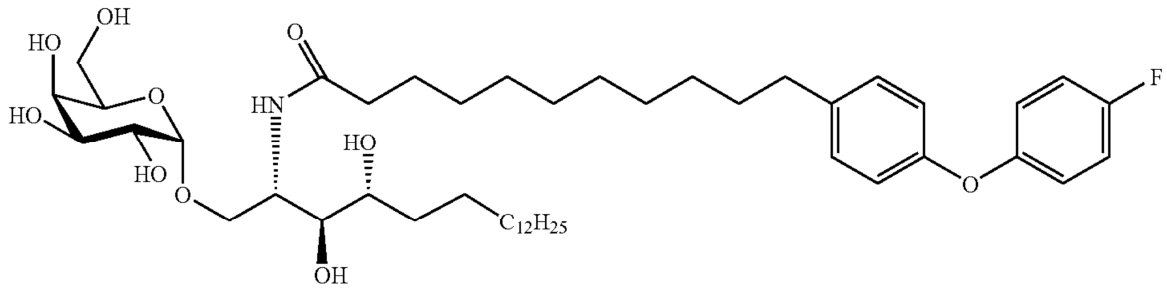
36. The composition of claim 1, wherein the KLH is at least 80% identical to a corresponding KLH moiety of SEQ ID NO. 2.

37. The composition of claim 1, wherein the Globo H moiety covalently linked to a single, monomeric_keyhole limpet hemocyanin (KLH) moiety is linked by a 4-(4-N- maleimidomethyl) cyclohexane-1-carboxyl hydrazide (MMCCH) linkage.

38. Use of the composition of claim 1 in the manufacture of a medicament for the treatment of a Globo H expressing cancer.

39. The use of claim 38, wherein the Globo H expressing cancer is breast cancer, lung cancer, stomach cancer, colon cancer, pancreatic cancer, prostate cancer, ovarian cancer, epithelial cancer, endometrial cancer, liver cancer, buccal cancer, nasopharyngeal cancer, dermal cancer, renal cancer, brain tumor, cervical cancer, intestinal cancer or bladder cancer.

40. The composition of claim 1, wherein the a-GalCer adjuvant has the following structure:



41. The composition of claim 1, wherein the single, monomeric KLH moiety can form a monomer, dimer, trimer, tetramer, pentamer, hexamer, heptamer, octamer, nonamer, decamer, undecamer, dodecamer, tridecamer, tetradecamer, pentadecamer, hexadecamer, heptadecamer, octadecamer, nonadecamer or didecamer.