CLAIMS:

1. A composition comprising:

liposomes;

an antigen capable of inducing a humoral immune response;

a carrier comprising a continuous phase of a hydrophobic substance; and

an adjuvant that activates or increases the activity of toll-like receptor 2 (TLR2) .

2. The composition of claim 1, wherein the adjuvant, preferably a lipid-based adjuvant, activates or increases the activity of TLR2, or a TLR2 dimer such as TLR1/2 or TLR2/6.

3. The composition of claim 1 or 2, wherein the adjuvant is a compound comprising at least one natural, synthetic or semi-synthetic lipid moiety, lipid component, or analog or derivative thereof, including for example a lipoamino acid, a lipoglycan, a lipopolysaccharide, a lipoteichoic acid or a cell-wall component of a Gram-positive or Gram-negative bacteria, Rhodopseudomonas viridis or mycoplasma.

4. The composition of any one of claims 1 to 3, wherein the adjuvant is PAM_2Cys-Ser-(Lys)4, PAM_3Cys-Ser-(Lys)4, PAM_3Cys-SKKKK(β-irradiated), *R*-PAM_3Cys-SKKKK, *S*-PAM_3Cys-SKKKK, PAM_3Cys-SKKKK(Biotin-Aca-Aca), PAM_3Cys-SKKKK (Fluorescein-Aca-Aca), PAM_3Cys-SKKKK (Rhodamine-Aca-Aca), PAM_3Cys-SKKKK-FLAG-tag, PHC-SKKKK, PHC-SKKKK(Biotin-Aca-Aca), PAM_3Cys-SSNAKIDQLSSDVQT, PAM_3Cys-SSNKSTTGSGETTTA, PAM_3Cys-SSTKPVSQDTSPKPA, PAM_3Cys-SSGSKPSGG PLPDAK, PAM_3Cys-SSGNKSAPSSSASSS, PAM_3Cys-GSHQMKSEGHANMQL, PAM_3Cys-SSSNNDAAGNGAAQT, PAM_3Cys-KQNVSSLDEKNSVSV, PAM_3Cys-NNSGKDGNTS ANSAD, PAM_3Cys-NNGGPELKSDEVAKS, PAM_3Cys-SQEPAAPAAEATPAG, PAM_3Cys-SSSKSSDSSAPKAYG, PAM_3Cys-AQEKEAKSELDYDQT, PAM_2Cys-SKKKK (mixture of RR and RS stereoisomers), *R*-PAM_2Cys-SKKKK (RR stereoisomer), *S*-PAM_2Cys-SKKKK (RS stereoisomer), PAMCys(PAM)-SKKKK, PAM_2Cys-SKKKK(Biotin-Aca-Aca)-NH_2, PAM_2Cys-SKKKK (Fluorescein-Aca-Aca)-NH_2, PAM_2Cys-SKKKK(Rhodamine-Aca-Aca)-NH_2, PAM_2Cys-SKKKK-FLAG-tag, PAM-Dhc-SKKKK, PAM-CSKKKK, PAM-Dhc-GDPKHPKSF,

PAM-CGDPKHPKSF, FSL-1 (Pam2CGDPKHPKSF), FSL-1-Ala, macrophage activating lipopeptide-2 (MALP-2), lipoarabinomannan from M. smegmatis (LAM-MS), lipomannan from M. smegmatis (LM-MS), lipopolysaccharide from P. gingivalis (LPS-PG Ultrapure), lipoteichoic acid from B. subtilis (LTA-BS) or S. aureus (LTA-SA), or derivatives or analogs thereof, or is a heat-killed bacteria that comprises the cell-wall component of a Gram-positive or Gram-negative bacteria.

5. The composition of any one of claims 1 to 4, wherein the adjuvant is a palmitic acid adjuvant.

6. The composition of any one of claims 1 to 5, wherein the adjuvant comprises dipalmitoyl-S-glyceryl-cysteine (PAM_2Cys) or tripalmitoyl-S-glyceryl-cysteine (PAM_3Cys).

7. The composition of any one of claims 1 to 6, wherein the adjuvant is PAM_2Cys-Ser-(Lys)4 or PAM_3Cys-Ser-(Lys)4.

8. The composition of any one of claims 1 to 7, wherein the antigen is a polypeptide or a carbohydrate.

9. The composition of any one of claims 1 to 8, wherein the antigen comprises a B cell epitope, or a plurality of B cell epitopes.

10. The composition of claim 9, wherein the B cell epitope is derived from a virus or bacteria, including for example influenza virus, Bordetella pertussis, or Bacillus anthracis.

11. The composition of claim 10, wherein the B cell epitope is an epitope of a hemagglutinin protein of H5N1 influenza virus, an epitope of pertussis toxoid protein, or an epitope of an anthrax recombinant protective antigen.

12. The composition of any one of claims 1 to 9, wherein the antigen is: an antigen associated with an infectious disease; a membrane surface-bound cancer antigen; a toxin; an allergen such as pollen; or an antigen associated with a disease where it is desirable to sequester the antigen in circulation, such as for example an amyloid protein.

13. The composition of any one of claims 1 to 12, wherein the antigen is encapsulated in the liposomes or both the antigen and the adjuvant are encapsulated in the liposomes.

14. The composition of any one of claims 1 to 13, wherein the composition is capable of inducing a humoral immune response with a single dose.

15. The composition of any one of claims 1 to 14 for the treatment or prevention of a disease or disorder ameliorated by a humoral immune response.

16. The composition of any one of claims 1 to 14 for the treatment or prevention of: an infectious disease; a cancer involving a membrane surface-bound cancer antigen; or a disease or disorder where it is desirable to sequester antigen in circulation, such as Alzheimer's disease.

17. The composition of any one of claims 1 to 14 for neutralizing a toxin, virus, bacterium or allergen, with an antibody.

CLAIMS:

1. A composition comprising:

liposomes;

an antigen that comprises a B cell epitope and is capable of inducing a humoral immune response;

a carrier comprising a continuous phase of a hydrophobic substance; and

an adjuvant that activates or increases the activity of toll-like receptor 2 (TLR2) .

2. The composition of claim 1, wherein the adjuvant, preferably a lipid-based adjuvant, activates or increases the activity of TLR2, or a TLR2 dimer such as TLR1/2 or TLR2/6.

3. The composition of claim 1 or 2, wherein the adjuvant is a compound comprising at least one natural, synthetic or semi-synthetic lipid moiety, lipid component, or analog or derivative thereof, including for example a lipoamino acid, a lipoglycan, a lipopolysaccharide, a lipoteichoic acid or a cell-wall component of a Gram-positive or Gram-negative bacteria, Rhodopseudomonas viridis or mycoplasma.

4. The composition of any one of claims 1 to 3, wherein the adjuvant is PAM_2Cys-Ser-(Lys)4, PAM_3Cys-Ser-(Lys)4, PAM_3Cys-SKKKK(β-irradiated), *R*-PAM_3Cys-SKKKK, *S*-PAM_3Cys-SKKKK, PAM_3Cys-SKKKK(Biotin-Aca-Aca), PAM_3Cys-SKKKK (Fluorescein-Aca-Aca), PAM_3Cys-SKKKK (Rhodamine-Aca-Aca), PAM_3Cys-SKKKK-FLAG-tag, PHC-SKKKK, PHC-SKKKK(Biotin-Aca-Aca), PAM_3Cys-SSNAKIDQLSSDVQT, PAM_3Cys-SSNKSTTGSGETTTA, PAM_3Cys-SSTKPVSQDTSPKPA, PAM_3Cys-SSGSKPSGG PLPDAK, PAM_3Cys-SSGNKSAPSSSASSS, PAM_3Cys-GSHQMKSEGHANMQL, PAM_3Cys-SSSNNDAAGNGAAQT, PAM_3Cys-KQNVSSLDEKNSVSV, PAM_3Cys-NNSGKDGNTS ANSAD, PAM_3Cys-NNGGPELKSDEVAKS, PAM_3Cys-SQEPAAPAAEATPAG, PAM_3Cys-SSSKSSDSSAPKAYG, PAM_3Cys-AQEKEAKSELDYDQT, PAM_2Cys-SKKKK (mixture of RR and RS stereoisomers), *R*-PAM_2Cys-SKKKK (RR stereoisomer), *S*-PAM_2Cys-SKKKK (RS stereoisomer), PAMCys(PAM)-SKKKK, PAM_2Cys-SKKKK(Biotin-Aca-Aca)-NH_2, PAM_2Cys-SKKKK (Fluorescein-Aca-Aca)-NH_2, PAM_2Cys-SKKKK(Rhodamine-Aca-Aca)-NH_2, PAM_2Cys-SKKKK-FLAG-tag, PAM-Dhc-SKKKK, PAM-CSKKKK, PAM-Dhc-GDPKHPKSF, PAM-

CGDPKHPKSF, FSL-1 (Pam2CGDPKHPKSF), FSL-1-Ala, macrophage activating lipopeptide-2 (MALP-2), lipoarabinomannan from M. smegmatis (LAM-MS), lipomannan from M. smegmatis (LM-MS), lipopolysaccharide from P. gingivalis (LPS-PG Ultrapure), lipoteichoic acid from B. subtilis (LTA-BS) or S. aureus (LTA-SA), or derivatives or analogs thereof, or is a heat-killed bacteria that comprises the cell-wall component of a Gram-positive or Gram-negative bacteria.

5. The composition of any one of claims 1 to 4, wherein the adjuvant is a palmitic acid adjuvant.

6. The composition of any one of claims 1 to 5, wherein the adjuvant comprises dipalmitoyl-S-glyceryl-cysteine (PAM_2Cys) or tripalmitoyl-S-glyceryl-cysteine (PAM_3Cys).

7. The composition of any one of claims 1 to 6, wherein the adjuvant is PAM_2Cys-Ser-(Lys)4 or PAM_3Cys-Ser-(Lys)4.

8. The composition of any one of claims 1 to 7, wherein the antigen is a polypeptide or a carbohydrate.

9. The composition of any one of claims 1 to 8, wherein the antigen comprises a plurality of B cell epitopes.

10. The composition of any one of claims 1 to 8, wherein the B cell epitope is derived from a virus or bacteria, including for example influenza virus, Bordetella pertussis, or Bacillus anthracis.

11. The composition of claim 10, wherein the B cell epitope is an epitope of a hemagglutinin protein of H5N1 influenza virus, an epitope of pertussis toxoid protein, or an epitope of an anthrax recombinant protective antigen.

12. The composition of any one of claims 1 to 9, wherein the antigen is: an antigen associated with an infectious disease; a membrane surface-bound cancer antigen; a toxin; an allergen such as pollen; or an antigen associated with a disease where it is desirable to sequester the antigen in circulation, such as for example an amyloid protein.

13. The composition of any one of claims 1 to 12, wherein the antigen is encapsulated in the liposomes or both the antigen and the adjuvant are encapsulated in the liposomes.

14. The composition of any one of claims 1 to 13, wherein the composition is capable of inducing a humoral immune response with a single dose.

15. Use of the composition of any one of claims 1 to 14 in the manufacture of a medicament for the treatment or prevention of a disease or disorder ameliorated by a humoral immune response.

16. Use of the composition of any one of claims 1 to 14 in the manufacture of a medicament for the treatment or prevention of: an infectious disease; a cancer involving a membrane surface-bound cancer antigen; or a disease or disorder where it is desirable to sequester antigen in circulation, such as Alzheimer's disease.

17. Use of the composition of any one of claims 1 to 14 in the manufacture of a medicament for neutralizing a toxin, virus, bacterium or allergen, with an antibody.