We claim:

1. A multivalent immunogenic composition comprising polysaccharide-protein conjugates consisting of a plurality of pneumococcal capsular polysaccharides from *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F individually conjugated to a carrier protein CRM197, and further comprising 2-phenoxyethanol (2-PE) at a concentration of between 7mg/mL and 15mg/mL.

2. The multivalent immunogenic composition of claim 1, wherein said composition comprises seven or more capsular polysaccharides from *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F.

3. The multivalent immunogenic composition of any one of claim 1-2, wherein said composition comprises 2-PE at a concentration of between 7 mg/mL and 15 mg/mL.

4. The multivalent immunogenic composition of as claimed in claim 1, wherein said composition comprises 2-PE at a concentration of about 10 mg/mL.

5. The multivalent immunogenic composition as claimed in claim 1, wherein said composition comprises 2-PE at a concentration of 4mg/dose, wherein the dose is a 0.5 mL dose.

6. The multivalent immunogenic composition of any one of claims 1-4, wherein said composition comprises not less than 7 mg/mL of 2-PE.

7. The multivalent immunogenic composition of any one of claims 1-4, wherein said composition comprises not less than 10 mg/mL of 2-PE.

8. The multivalent immunogenic composition of as claimed in any one of claims 1-7, wherein said composition further comprises an adjuvant, and wherein said adjuvant is aluminium phosphate.

9. The multivalent immunogenic composition of as claimed in any one of claims 1-8, wherein the antigenicity of the immunogenic composition is stable for not less than 1 year, 1.5 years, 2 years or 2.5 years.

10. The multivalent immunogenic composition of as claimed in any one of claims 1-9, wherein, following inoculation with one or more micro-organisms, the concentration of said micro-organisms is reduced over time.

11. The multivalent immunogenic composition of claim 10, wherein, following inoculation with one or more bacteria strains, the composition presents at least 1.0 log reduction from the initial micro-organism count at 24 hours, at least 3.0 log reduction at 7 days from the previous value measured and not more than 0.5 log increase at 28 days from the previous value measured.

12. The multivalent immunogenic composition of claim 10, wherein, following inoculation with one or more bacteria strains, the composition presents at least 2.0 log reduction from the initial calculated count at 6 hours after inoculation, at least 3.0 log reduction at 24 hours from the previous value measured and no recovery at 28 days.
The multivalent immunogenic composition of as claimed in any one of claims 10-13, wherein the micro-organism strains are one or more strains selected from *P. aeruginosa*, *S. aureus*, *E. coli* and *B. subtilis*.

The multivalent immunogenic composition of as claimed in any one of claims 10-13, wherein the composition is inoculated multiple times.

The multivalent immunogenic composition of as claimed in claim 13-7 or 48, wherein a second inoculation occurs at 6 hours following the initial inoculation, a third inoculation occurs at 24 hours following the initial inoculation, a third inoculation occurs at 7 days following the initial inoculation and a fourth-fifth inoculation occurs at 14 days following the initial inoculation.

The multivalent immunogenic composition of as claimed in any one of claims 1-11, wherein said composition further comprises one or more of a buffer, a cryoprotectant, a salt, a divalent cation, a non-ionic detergent, and an inhibitor of free radical oxidation.

A multivalent immunogenic composition formulation of pneumococcal capsular polysaccharides from serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F, individually conjugated to CRM197, wherein the multivalent immunogenic composition is formulated in a sterile liquid to comprise: about 4.4 μg/mL of each polysaccharide, except for 6B at about 8.8 μg/mL; about 58 μg/mL CRM197 carrier protein; about 0.25 mg/mL of elemental aluminum in the form of aluminum phosphate; about 0.85% sodium chloride; about 0.02% polysorbate 80; about 5 mM sodium succinate buffer at a pH of 5.8; and about 10 mg/mL of 2-phenoxyethanol.

A vial containing a multivalent immunogenic composition of as claimed in any one of claims 1-11.

The vial of as claimed in claim 48, wherein said vial contains more than one dose of the immunogenic composition.

A pre-filled vaccine delivery device comprising a multivalent immunogenic composition of as claimed in any one of claims 1-11.

The pre-filled vaccine delivery device of as claimed in claim 2014, wherein said device is or comprises a syringe.

The pre-filled vaccine delivery device of claim 19, wherein said device is or comprises a dual or multiple chamber syringe or vials or combinations thereof.

The pre-filled vaccine of claims 20-22, wherein said multivalent immunogenic composition is formulated for intramuscular or subcutaneous injection.

A kit for preparing the multivalent immunogenic composition of as claimed in any one of claims 1-11, wherein the kit comprises (i) said plurality of capsular polysaccharides in a lyophilized form of the composition of any one of the above claims, and (ii) aqueous material for reconstituting component (i) in order to provide the aqueous composition.

A multi-dose vaccine comprising 4 doses of a vaccine in a vial, each dose comprising from 4 to 20 mg/mL, preferably 10 mg/mL of 2-phenoxyethanol, wherein a dose is 0.5 mL of vaccine.
26. A container comprising two doses or more, at 0.1 to 2 mL per dose, of the multivalent immunogenic composition of as claimed in any one of claims 1-17.

27. The container of as claimed in claim 26 wherein the dose is a 0.5 mL dose.

28. The container of as claimed in claims 26-27 comprising 2 to 10 doses.

29. A method for measuring the efficacy of a vaccine formulation comprising one or more select preservative agents in the presence of some or all of the immunogenic and non-immunogenic components of the vaccine composition, wherein the test comprises at least two steps of inoculating the test composition with a select micro-organism population and comparing the log reduction of inoculated micro-organism(s) over time and under particular environmental conditions (e.g., temperature) to the log reduction in a control composition lacking the test preservative(s).

Dated this 20th Day of November 2012

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We claim:

1. A multivalent immunogenic composition comprising polysaccharide-protein conjugates consisting of pneumococcal capsular polysaccharides from *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F individually conjugated to CRM<sub>197</sub>, and further comprising 2-phenoxymethanol (2-PE) at a concentration of between 7mg/mL and 15mg/mL.

2. The multivalent immunogenic composition as claimed in claim 1, wherein said composition comprises 2-PE at a concentration of about 10 mg/mL.

3. The multivalent immunogenic composition as claimed in claim 1, wherein said composition comprises 2-PE at a concentration of 4mg/dose, wherein the dose is a 0.5 mL dose.

4. The multivalent immunogenic composition as claimed in any one of claims 1-3, wherein said composition further comprises an adjuvant, and wherein said adjuvant is aluminium phosphate.

5. The multivalent immunogenic composition as claimed in any one of claims 1 -4, wherein the antigenicity of the immunogenic composition is stable for not less than 1 year, 1.5 years, 2 years or 2.5 years.

6. The multivalent immunogenic composition as claimed in any one of claims 1-5, wherein, following inoculation with one or more micro-organisms, the concentration of said micro-organisms is reduced over time.

7. The multivalent immunogenic composition as claimed in claim 6, wherein the micro-organism strains are one or more strains selected from *P. aeruginosa*, *S. aureus*, *E. coli* and *B. subtilis*.

8. The multivalent immunogenic composition as claimed in any one of claims 6-7, wherein the composition is inoculated multiple times.

9. The multivalent immunogenic composition as claimed in claim 7 or 8, wherein a second inoculation occurs at 6 hours following the initial inoculation, a third inoculation occurs at 24 hours following the initial inoculation, a fourth inoculation occurs at 7 days following the initial inoculation and a fifth inoculation occurs at 14 days following the initial inoculation.

10. The multivalent immunogenic composition as claimed in any one of claims 1-9, wherein said composition further comprises one or more of a buffer, a cryoprotectant, a salt, a divalent cation, a non-ionic detergent, and an inhibitor of free radical oxidation.

11. A multivalent immunogenic composition formulation of pneumococcal capsular polysaccharides from serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F, individually conjugated to CRM<sub>197</sub>, wherein the multivalent immunogenic composition is formulated in a sterile liquid to comprise: 4.4 μg/mL of each polysaccharide, except for 6B at 8.8 μg/mL; 58 μg/mL CRM<sub>197</sub> carrier protein; 0.25 mg/mL of elemental aluminum in the form of aluminum phosphate; 0.85% sodium chloride; 0.02% polysorbate 80; 5 mM sodium succinate buffer at a pH of 5.8; and 10 mg/mL of 2-phenoxymethanol.

12. A vial containing a multivalent immunogenic composition as claimed in any one of claims 1-11.
13. The vial as claimed in claim 12, wherein said vial contains more than one dose of the immunogenic composition.

14. A pre-filled vaccine delivery device comprising a multivalent immunogenic composition as claimed in any one of claims 1-11.

15. The pre-filled vaccine delivery device as claimed in claim 14, wherein said device is or comprises a syringe.

16. A kit for preparing the multivalent immunogenic composition as claimed in any one of claims 1-11, wherein the kit comprises (i) said plurality of capsular polysaccharides in a lyophilized form of the composition of any one of the above claims, and (ii) aqueous material for reconstituting component (i) in order to provide the aqueous composition.

17. A container comprising two doses or more, at 0.1 to 2 mL per dose, of the multivalent immunogenic composition as claimed in any one of claims 1-11.

18. The container as claimed in claim 17 wherein the dose is a 0.5 mL dose.

19. The container as claimed in claims 17-18 comprising 2 to 10 doses.

Dated this 20th Day of November 2012

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