**Claims**

We claim:

1. A nanoparticle composition comprising:

a plurality of nanoparticles, each of which is comprised of a biodegradable or

biocompatible polymer arranged in a nanoparticle structure defining an internal lumen and an external surface; and

a preparation of hydrophilic cellular components encapsulated within the internal lumen.

2. A nanoparticle composition comprising:

a plurality of nanoparticles, each of which is comprised of a biodegradable or

biocompatible polymer arranged in a nanoparticle structure defining an internal luman and an external surface; and

a preparation of hydrophobic cellular components associated with the external surface.

3. A nanoparticle composition comprising:

a plurality of nanoparticles, each of which is comprised of a biodegradable or

biocompatible polymer arranged in a nanoparticle structure defining an internal lumen and an external surface;

a preparation of hydrophilic cellular components encapsulated within the internal lumen; and

a preparation of hydrophobic cellular components associated with the external surface.

4. The nanoparticle composition of any one of claims 1-3, wherein the preparation of hydrophilic cellular components comprises a hydrophilic extract of a cellular preparation.

5. The nanoparticle composition of any one of claims 1-3, wherein the preparation of hydrophobic cellular components comprises or consists of a hydrophobic extract of a cellular preparation.

6. The nanoparticle composition of claim 4, wherein the hydrophilic extract comprises or consists of an aqueous extract of the cellular preparation.

7. The nanoparticle composition of any one of the preceding claims, which composition comprises an antigen.

8. The nanoparticle composition of claim 7, wherein the antigen is or comprises an allergic antigen.

9. The nanoparticle composition of claim 7, wherein the antigen is or comprises an anaphylactic antigen.

10. The nanoparticle composition of claim 7, wherein the antigen is or comprises an infectious antigen.

11. The nanoparticle composition of claim 7, wherein the antigen is or comprises an autoantigen.

12. The nanoparticle compostion of claim 7, wherein the antigen is or comprises a disease-associated antigen.

13. The nanoparticle composition of claim 7, wherein the antigen is partly or wholly encapsulated within the lumen.

14. The nanoparticle composition of claim 7, wherein the antigen is partly or wholly associated with the external surface.

15. The nanoparticle composition of claim 7, wherein the antigen is mixed with the nanoparticles so that each is dispersed throughout the composition.

16. The nanoparticle composition of claim 7, which composition comprises first and second antigens, the first antigen being partly or wholly encapsulated within nanoparticle lumens and the second antigen being partly or wholly associated with the external surface of nanoparticles.

17. The nanoparticle composition of claim 10, wherein the infectious antigen is provided with one or more additional components of the infectious agent.

18. The nanoparticle composition of any one of claims 7-12, wherein the antigen or infectious agent is selected from the group consisting of a food antigen, a microbial antigen, a viral antigen, a tumor antigen, and an environmental antigen.

19. The nanoparticle composition of any one of claims 1-6, wherein at least one of the hydrophilic cellular components and the hydrophobic cellular components is provided from a microbial cellular preparation.

20. The nanoparticle composition of any one of claims 1-6, wherein at least one of the hydrophilic cellular components and the hydrophobic cellular components is provided from a tumor cell cellular preparation.

21. The nanoparticle composition of any one of claims 1-3, wherein the biodegradable or biocompatible polymer is poly(lactic-co-gly colic acid).

22. A pharmaceutical composition comprising the nanoparticle composition of any one of the preceeding claims.

23. Use of a nanoparticle composition in manufacture of a medicament for administering to a subject in need thereof, the nanoparticle composition comprising:

a plurality of nanoparticles, each of which is comprised of a biodegradable or

biocompatible polymer arranged in a nanoparticle structure defining an internal lumen and an external surface; and

a preparation of hydrophilic cellular components encapsulated within the internal lumen.

24. Use of a nanoparticle composition in manufacture of a medicament for administering to a subject in need thereof, the nanoparticle composition comprising

a plurality of nanoparticles, each of which is comprised of a biodegradable or

biocompatible polymer arranged in a nanoparticle structure defining an internal lumen and an external surface; and

a preparation of hydrophobic cellular components associated with the external surface.

25. Use of a nanoparticle composition in manufacture of a medicament for administering to a subject in need thereof, the nanoparticle composition comprising

a plurality of nanoparticles, each of which is comprised of a biodegradable or

biocompatible polymer arranged in a nanoparticle structure defining an internal lumen and an external surface; and

a preparation of hydrophilic cellular components encapsulated within the internal lumen; and

a preparation of hydrophobic cellular components associated with the external surface.

26. The use according to claims 23-25, wherein the preparation of hydrophilic cellular components comprises a hydrophilic extract of a cellular preparation.

27. The use according to any one of claims 23-25, wherein the preparation of hydrophobic cellular components comprises or consists of a hydrophobic extract of a cellular preparation.

28. The use according to claim 26, wherein the hydrophilic extract comprises or consists of an aqueous extract of the cellular preparation.

29. The use according to any one of claims 23-28, wherein the nanoparticle composition comprises an antigen.

30. The use according to claim 29, wherein the antigen is or comprises an allergic antigen

31. The use according to claim 29, wherein the antigen is or comprises and anaphylactic antigen.

32. The use according to claim 29, wherein the antigen is or comprises an infectious antigen.

33. The use according to claim 29, wherein the antigen is or comprises an autoantigen.

34. The use according to claim 29, wherein the antigen is or comprises a disease-associated antigen.

35. The use according to claim 29, wherein the antigen is partly or wholly encapsulated within the lumen.

36. The use according to claim 29, wherein the antigen is partly or wholly associated with the external surface.

37. The use according to claim 29, wherein the antigen is mixed with the nanoparticles so that each is dispersed throughout the composition.

38. The use according to claim 29, wherein the nanoparticle composition comprises first and second antigens, the first antigen being partly or wholly encapsulated within nanoparticle lumens and the second antigen being partly or wholly associated with the external surface of nanoparticles.

39. The use according to any one of claims 23-25, wherein the subject is suffering from at least one of allergy, infection, and cancer.

40. The use according to any one of claims 23-25, wherein the nanoparticle is administered intravenously, intradermally, transdermally, orally, subcutaneously, and/or transmucosally.

41. The use according to claim 40, wherein the transmucosal administration is buccal, nasal, bronchial, vaginal, rectal, and/or sublingual administration.

42. The use according to claim 29, wherein the antigen is selected from the group consisting of a food antigen, a microbial antigen, a viral antigen, a tumor antigen, and an environmental antigen.

43. The use according to any one of claims 23-27, wherein at least one of the hydrophilic cellular components and the hydrophobic cellular components is provided from a microbial cellular preparation.

44. The use according to any one of claims 23-27, wherein at least one of the hydrophilic cellular preparation and the hydrophobic cellular preparation is provided from a tumor cell cellular preparation.

45. The use according to any one of claims 23-43 , wherein the biodegradable or biocompatible polymer is poly(lactic-co-glycolic acid).

46. A method of forming a nanoparticle composition comprising:

providing a preparation of one or more hydrophilic cellular components; providing a biodegradable or biocompatible polymer;

associating the preparation of hydrophilic cellular components and the biodegradable or biocompatible polymer; and

forming a nanoparticle structure wherein the biodegradable or

biocompatible polymer defines an internal lumen and an external surface; wherein the hydrophilic cellular components are encapsulated within the internal lumen.

47. A method of forming a nanoparticle composition comprising:

providing a preparation of one or more hydrophobic cellular components; providing a biodegradable or biocompatible polymer;

associating the preparation of hydrophobic cellular components and the biodegradable or biocompatible polymer; and

forming a nanoparticle structure wherein the biodegradable or biocompatible polymer defines an internal lumen and an external surface; wherein the the hydrophobic cellular components are associated with the external surface.

48. A method of forming a nanoparticle composition comprising:

providing a cellular preparation;

separating the cellular preparation into a preparation of hydrophilic cellular components and a preparation of hydrophobic cellular components;

providing a biodegradable or biocompatible polymer;

associating the preparation of hydrophilic cellular components and the biodegradable or biocompatible polymer;

associating the preparation of hydrophobic cellular components and the biodegradable or biocompatible polymer; and

forming a nanoparticle structure wherein the biodegradable or biocompatible polymer defines an internal lumen and an external surface; wherein the hydrophilic cellular components are encapsulated within the internal lumen and the hydrophobic cellular components are associated with the external surface.

49. The method of claim 45 or 47, wherein the preparation of hydrophilic cellular components comprises a hydrophilic extract of a cellular preparation.

50. The method of claim 46 or 47, wherein the preparation of hydrophobic cellular components comprises a hydrophobic extract of a cellular preparation.

51. The method of any one of claims 48, wherein the hydrophilic extract comprises an aqueous extract of the cellular preparation.

52. The method of any one of claims 45-47, wherein the nanoparticle composition further comprises an antigen.

53. The method of claims 51, wherein the antigen is or comprises an allergic antigen.

54. The method of claim 51, wherein the antigen is or comprises an anaphylactic antigen.

55. The method of claim 51, wherein the antigen is or comprises an infectious antigen.

56. The method of claim 51, wherein the antigen is or comprises an autoantigen.

57. The method of claim 51, wherein the antigen is or comprises a disease-associated antigen.

58. The method of claim 51 , wherein the antigen is partly or wholly encapsulated within the lumen.

59. The method of claim 51, wherein the antigen is partly or wholly associated with the external surface.

60. The method of claim 51, wherein the nanoparticle composition comprises first and second antigens, the first antigen being partly or wholly encapsulated within the lumen and the second antigen being partly or wholly associated with the external surface.

**Claims**

1. A nanoparticle composition comprising:

a plurality of nanoparticles, each of which is comprised of a biodegradable or biocompatible polymer arranged in a nanoparticle structure whose external surface is coated with a preparation comprising a crude hydrophobic bacterial extract and a hydrophilic antigen encapsulated by the nanoparticle structure so that, when the nanoparticle composition is administered to a subject, the antigen is hidden from immune system components.

2. The nanoparticle composition of claim 1, wherein the nanoparticles each also comprise a preparation comprising one or more hydrophilic cellular components.

3. The nanoparticle composition of claim 1, wherein the nanoparticles each further comprise a second antigen, optionally also encapsulated by the nanoparticle structure so that, when the nanoparticle composition is administered to a subject, the antigen is hidden from immune system components.

4. The nanoparticle composition of claim 1, wherein the antigen is selected from the group consisting of an allergic antigen, an anaphylactic antigen, an infectious antigen, an autoantigen, a disease-associated antigen, a food antigen, a microbial antigen, a viral antigen, a tumor antigen, and an environmental antigen.

5. The nanoparticle composition of claim 1, wherein the biodegradable or biocompatible polymer is poly(lactic-co-glycolic acid).

6. A method of forming a nanoparticle composition comprising:

providing a hydrophilic preparation comprising an antigen;

providing a biodegradable or biocompatible polymer;

associating the hydrophilic preparation with the biodegradable or biocompatible polymer so that nanoparticles comprising the polymer and the preparation are formed; and

coating the nanoparticles with a crude hydrophobic bacterial extract.

7. The method of claim 6, wherein the nanoparticle composition further comprises an antigen.

8. The method of claim 7, wherein the antigen is selected from the group consisting of an allergic antigen, an anaphylactic antigen, an infectious antigen, an autoantigen, a disease-associated antigen, a food antigen, a microbial antigen, a viral antigen, a tumor antigen, and an environmental antigen.

~~9~~. The method of claim 6, wherein the nanoparticles each further comprise a second antigen, optionally also encapsulated by the nanoparticle structure so that, when the nanoparticle composition is administered to a subject, the antigen is hidden from immune system components.

10. The composition of claim 2, wherein the crude hydrophobic bacterial extract of a cellular preparation further comprises immunological components present in absolute or relative amounts as compared to those found in natural microbial cells.

11. The composition of claim 2 or 4, wherein the antigen is provided as a crude hydrophilic extract of a biological source.

12. The composition of claim 2, wherein the preparation comprises a crude hydrophilic cellular extract.

13. The composition of claim 12, wherein the crude hydrophilic cellular extract comprises or consists of an aqueous cellular extract.

14. The composition of claim 13, wherein the cellular extract is a microbial extract.

15. The composition of claim 3, wherein the second antigen is optionally an allergic antigen, an anaphylactic antigen, an infection antigen, an autoantigen, or a disease-associated antigen.