CLAIMS

1. An immunogenic cationic oil-in-water emulsion comprising emulsion particles that contain an oil core and a cationic lipid, and a nucleic acid molecule that is complexed to the emulsion particles, and wherein the average diameter of the emulsion particles is from about 80 nm to about 180 nm and the N/P of the emulsion is at least 4:1; with the proviso that the nucleic acid molecule does not encode secreted alkaline phosphatase, and the further proviso that the nucleic acid molecule is not an RNA encoded by the plasmid A317, the sequence of which is shown in Figure 7A of US Patent Application No. 61/361,892.

2. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the nucleic acid molecule encodes an antigen.

3. The immunogenic cationic oil-in-water emulsion of claim 1 or 2, wherein the nucleic acid molecule is RNA.

4. The immunogenic cationic oil-in-water emulsion of claim 3, wherein the RNA is self-replicating RNA.

5. The immunogenic cationic oil-in-water emulsion of any one of the preceding claims, wherein the immunogenic cationic oil-in-water emulsion is buffered, and has a pH from about 6.0 to about 8.0.

6. The immunogenic cationic oil-in-water emulsion of claim 5, wherein the immunogenic cationic oil-in-water emulsion comprises a buffer selected from the group consisting of a citrate buffer, a succinate buffer, an acetate buffer, and combinations thereof.

7. The immunogenic cationic oil-in-water emulsion of claim 5 or 6, wherein the buffer is a citrate buffer and the pH is about 6.5.

8. The immunogenic cationic oil-in-water emulsion of any one of claims 1-6, further comprising an inorganic salt.

9. The immunogenic cationic oil-in-water emulsion of claim 8, wherein the inorganic salt concentration is no greater than 30mM.

10. The immunogenic cationic oil-in-water emulsion of any one of claims 1-9, further comprising a nonionic tonicifying agent.

11. The immunogenic cationic oil-in-water emulsion of claim 10, wherein the nonionic tonicifying agent is a sugar, a sugar alcohol or combinations thereof.

12. The immunogenic cationic oil-in-water emulsion of claim 11, wherein the nonionic tonicifying agent is selected from the group consisting of sucrose, trehalose, sorbitol, dextrose and combinations thereof.

13. The immunogenic cationic oil-in-water emulsion of any one of claims 1-12, further comprising a polymer in the aqueous phase.

14. The immunogenic cationic oil-in-water emulsion of claim 13, wherein the polymer is a poloxamer.

15. The immunogenic cationic oil-in-water emulsion of claim 13 or14, wherein the polymer is Pluronic F127.

16. The immunogenic cationic oil-in water emulsion of any one of claims 13-15, wherein the emulsion contains about 0.05% to about 20% (w/v) polymer.

17. The immunogenic cationic oil-in water emulsion of any one of claims 1-16, wherein the average diameter of the emulsion particles is from about 80 nm to about 130 nm.

18. The immunogenic cationic oil-in water emulsion of any one of claims 1-17, wherein the N/P of the emulsion is from 4:1 to about 20:1.

19. The immunogenic cationic oil-in water emulsion of any one of claims 1-18, wherein the N/P of the emulsion is from 4:1 to about 15:1.

20. The immunogenic cationic oil-in-water emulsion of any one of claims 1-19, wherein the cationic oil-in-water emulsion is isotonic.

21. The immunogenic cationic oil-in-water emulsion of any one of claims 1-20, wherein the oil core comprises an oil that is selected from the group consisting of: Castor oil, Coconut oil, Corn oil, Cottonseed oil, Evening primrose oil, Fish oil, Jojoba oil, Lard oil,

Linseed oil, Olive oil, Peanut oil, Safflower oil, Sesame oil, Soybean oil, Squalene, Squalane, Sunflower oil, Wheatgerm oil, and combinations thereof.

22. The immunogenic cationic oil-in-water emulsion of claim 21, wherein the oil is Squalene.

23. The immunogenic cationic oil-in-water emulsion of any one of claims 1-22, wherein the cationic lipid is selected from the group consisting of: 1,2-dioleoyloxy-3-(trimethylammonio)propane (DOTAP), 3β-[N-(N',N'-Dimethylaminoethane)-carbamoyl]Cholesterol (DC Cholesterol), dimethyldioctadecylammonium (DDA), 1,2-Dimyristoyl-3-TrimethylAmmoniumPropane (DMTAP), dipalmitoyl($C_{16:0}$)trimethyl ammonium propane (DPTAP), distearoyltrimethylammonium propane (DSTAP), N-[1-(2, 3-dioleyloxy)propyl]-N,N,N-trimethylammonium chloride (DOTMA), N,N-dioleoyl-N,N-dimethylammonium chloride (DODAC), 1,2-dioleoyl-sn-glycero-3-ethylphosphocholine (DOEPC), 1,2-dioleoyl-3-dimethylammonium-propane (DODAP), 1,2-dilinoleyloxy-3-dimethylaminopropane (DLinDMA), Lipids E0001-E0118, and combinations thereof.

24. The immunogenic cationic oil-in-water emulsion of any one of claims 1-22, wherein the cationic lipid comprises a quaternary amine.

25. The immunogenic cationic oil-in-water emulsion of claims 23, wherein the cationic lipid is DOTAP.

26. The immunogenic cationic oil-in-water emulsion of any one of claims 1-25, wherein the particle further comprises a surfactant.

27. The immunogenic cationic oil-in-water emulsion of claim 26, wherein the surfactant is a nonionic surfactant.

28. The immunogenic cationic oil-in-water emulsion of claim 27, wherein the surfactan is SPAN85 (Sorbtian Trioleate), Tween 80 (polysorbate 80), or a combination thereof.

29. The immunogenic cationic oil-in-water emulsion of any one of the preceding claims, wherein the emulsion further comprises an antioxidant.

30. A method for make an immunogenic cationic oil-in-water emulsion of any one of claims 1-29, comprising providing (i) a cationic oil-in-water emulsions containing emulsion particles that contain an oil core and a cationic lipid, and (ii) an aqueous solution that contains a nucleic acid, and combining (i) and (ii) thereby making said immunogenic cationic oil-in-water emulsion.

31. A method for generating an immune response in a subject, comprising administering to the subject an effective amount of an immunogenic cationic oil-in-water emulsion of any one of claims 1-29.

CLAIMS

1. An invention not claimed in any divisional application.