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, wherein:

a) the concentration of cationic lipid in said emulsion is greater than 1.6 mg/ml,

b) the nucleic acid is RNA that encodes a polypeptide antigen,

c) the average diameter of the emulsion particles is from about 80 nm to about 180 nm, and

d) 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 the RNA encoded by the plasmid A317, the sequence of which is given by SEQ ID NO:1.

2. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the RNA is self-replicating RNA.

3. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the immunogenic cationic oil-in-water emulsion is buffered, and has a pH from about 6.0 to about 8.0.

4. The immunogenic cationic oil-in-water emulsion of claim 3, 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.

5. The immunogenic cationic oil-in-water emulsion of claim 4, wherein the buffer is a citrate buffer and the pH is about 6.5.

6. The immunogenic cationic oil-in-water emulsion of claim 1, further comprising an inorganic salt.

7. The immunogenic cationic oil-in-water emulsion of claim 6, wherein the inorganic salt concentration is no greater than 30 mM.

8. The immunogenic cationic oil-in-water emulsion of claim 1, further comprising a nonionic tonicifying agent.

9. The immunogenic cationic oil-in-water emulsion of claim 8, wherein the nonionic tonicifying agent is a sugar, a sugar alcohol or combinations thereof.

10. The immunogenic cationic oil-in-water emulsion of claim 9, wherein the nonionic tonicifying agent is selected from the group consisting of sucrose, trehalose, sorbitol, dextrose and combinations thereof.

11. The immunogenic cationic oil-in-water emulsion of claim 1, further comprising a polymer in the aqueous phase.

12. The immunogenic cationic oil-in-water emulsion of claim 11, wherein the polymer is a poloxamer.

13. The immunogenic cationic oil-in-water emulsion of claim 11, wherein the polymer is Pluronic F127.

14. The immunogenic cationic oil-in water emulsion of claim 11, wherein the emulsion contains about 0.05% to about 20% (w/v) polymer.

15. The immunogenic cationic oil-in water emulsion of claim 1, wherein the average diameter of the emulsion particles is from about 80 nm to about 130 nm.

16. The immunogenic cationic oil-in water emulsion of claim 1, wherein the N/P of the emulsion is from 4:1 to about 20:1.

17. The immunogenic cationic oil-in water emulsion of claim 1, wherein the N/P of the emulsion is from 4:1 to about 15:1.

18. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the cationic oil-in-water emulsion is isotonic with human blood.

19. The immunogenic cationic oil-in-water emulsion of claim 1, 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.

20. The immunogenic cationic oil-in-water emulsion of claim 19, wherein the oil is Squalene.

21. The immunogenic cationic oil-in-water emulsion of claim 1, 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(C16:0)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.

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

23. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the cationic lipid comprises a quaternary amine.

24. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the particle further comprises a surfactant.

25. The immunogenic cationic oil-in-water emulsion of claim 24, wherein the surfactant is a nonionic surfactant.

26. The immunogenic cationic oil-in-water emulsion of claim 25, wherein the surfactant is Sorbitan Trioleate, polysorbate 80, or a combination thereof.

27. The immunogenic cationic oil-in-water emulsion of claim 1, wherein the emulsion further comprises an antioxidant selected from citrate, ascorbate, a salt of citrate, or a salt of ascorbate.