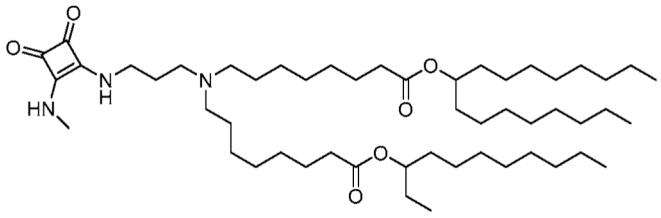
CLAIMS

1. A compound being Compound 301:



(Compound 301),

or a salt or isomer thereof.

2. The compound of claim 1, wherein the salt is a pharmaceutically acceptable salt.

3. A nanoparticle composition comprising a lipid component which comprises the compound of claim 1.

4. The nanoparticle composition of claim 3, wherein the lipid component further comprises a phospholipid.

5. The nanoparticle composition of claim 4, wherein the phospholipid is selected from the group consisting of

1,2-dilinoleoyl-sn-glycero-3-phosphocholine (DLPC),
1,2-dimyristoyl-sn-glycero-phosphocholine (DMPC),
1,2-dioleoyl-sn-glycero-3-phosphocholine (DOPC),
1,2-dipalmitoyl-sn-glycero-3-phosphocholine (DPPC),
1,2-distearoyl-sn-glycero-3-phosphocholine (DSPC),
1,2-diundecanoyl-sn-glycero-phosphocholine (DUPC),
1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (POPC),
1,2-di-O-octadecenyl-*sn*-glycero-3-phosphocholine (18:0 Diether PC),
1-oleoyl-2-cholesterylhemisuccinoyl-*sn*-glycero-3-phosphocholine (OChemsPC),
1-hexadecyl-sn-glycero-3-phosphocholine (C16 Lyso PC),
1,2-dilinolenoyl-sn-glycero-3-phosphocholine,
1,2-diarachidonoyl-sn-glycero-3-phosphocholine,
1,2-didocosahexaenoyl-sn-glycero-3-phosphocholine,
1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (DOPE),

1,2-diphytanoyl-sn-glycero-3-phosphoethanolamine (ME 16.0 PE),
1,2-distearoyl-sn-glycero-3-phosphoethanolamine,
1,2-dilinoleoyl-sn-glycero-3-phosphoethanolamine,
1,2-dilinolenoyl-sn-glycero-3-phosphoethanolamine,
1,2-diarachidonoyl-sn-glycero-3-phosphoethanolamine,
1,2-didocosahexaenoyl-sn-glycero-3-phosphoethanolamine,
1,2-dioleoyl-sn-glycero-3-phospho-rac-(1-glycerol) sodium salt (DOPG),
sphingomyelin, and
mixtures thereof.

6. The nanoparticle composition of claim 5, wherein the phospholipid is DSPC or DOPE.

7. The nanoparticle composition of claim 4, wherein the lipid component further comprises a structural lipid.

8. The nanoparticle composition of claim 7, wherein the structural lipid is selected from the group consisting of cholesterol, fecosterol, sitosterol, ergosterol, campesterol, stigmasterol, brassicasterol, tomatidine, ursolic acid, alpha-tocopherol, and mixtures thereof.

9. The nanoparticle composition of claim 8, wherein the structural lipid is cholesterol.

10. The nanoparticle composition of claim 7, wherein the lipid component further comprises a PEG lipid.

11. The nanoparticle composition of claim 10, wherein the PEG lipid is selected from the group consisting of a PEG-modified phosphatidylethanolamine, a PEG-modified phosphatidic acid, a PEG-modified ceramide, a PEG-modified dialkylamine, a PEG-modified diacylglycerol, a PEG-modified dialkylglycerol, and mixtures thereof.

12. The nanoparticle composition of claim 10, wherein the lipid component comprises 30 mol % to 60 mol % said Compound 301, 0 mol % to 30 mol % phospholipid, 18.5 mol % to 48.5 mol % structural lipid, and 0 mol % to 10 mol % PEG lipid.

13. The nanoparticle composition of claim 10, wherein the lipid component comprises 35 mol % to 55 mol % said Compound 301, 5 mol % to 25 mol % phospholipid, 30 mol % to 40 mol % structural lipid, and 0 mol % to 10 mol % PEG lipid.

14. The nanoparticle composition of claim 10, wherein the lipid component comprises 50 mol % said Compound 301, 10 mol % phospholipid, 38.5 mol % structural lipid, and 1.5 mol % PEG lipid.

15. The nanoparticle composition of any one of claims 3-14, further comprising a therapeutic and/or prophylactic agent.

16. The nanoparticle composition of claim 15, wherein the therapeutic and/or prophylactic agent is a nucleic acid.

17. The nanoparticle composition of claim 15, wherein the therapeutic and/or prophylactic agent is a ribonucleic acid (RNA).

18. The nanoparticle composition of claim 17, wherein the RNA is selected from the group consisting of a small interfering RNA (siRNA), an asymmetrical interfering RNA (aiRNA), a microRNA (miRNA), a Dicer-substrate RNA (dsRNA), a small hairpin RNA (shRNA), a messenger RNA (mRNA), and mixtures thereof.

19. The nanoparticle composition of claim 17, wherein the RNA is an mRNA.

20. The nanoparticle composition of claim 19, wherein the mRNA includes one or more of a stem loop, a chain terminating nucleoside, a polyA sequence, a polyadenylation signal, and/or a 5’ cap structure.

21. The nanoparticle composition of claim 19, wherein the encapsulation efficiency of the therapeutic and/or prophylactic agent is at least 80% or at least 90%.

22. The nanoparticle composition of claim 19, wherein the wt/wt ratio of the lipid component to the mRNA is from 10:1 to 60:1.

23. The nanoparticle composition of claim 19, wherein the wt/wt ratio of the lipid component to the mRNA is 20:1.

24. The nanoparticle composition of claim 19, wherein the N:P ratio is from 5:1 to 8:1.

25. A pharmaceutical composition comprising the nanoparticle composition of claim 19 and a pharmaceutically acceptable carrier.

26. An ex-vivo method of delivering a therapeutic and/or prophylactic agent to a mammalian cell, the method comprising administering to a subject the nanoparticle composition of any one of claims 15-24, said administering comprising contacting the cell with the nanoparticle composition, whereby the therapeutic and/or prophylactic agent is delivered to the cell.

27. A method of producing a polypeptide of interest in a mammalian cell, the method comprising contacting the cell with the nanoparticle composition of claim 19, wherein the mRNA encodes the polypeptide of interest, whereby the mRNA is capable of being translated in the cell to produce the polypeptide of interest.

28. The nanoparticle composition of any one of claims 15-24 for use in therapy.

29. Use of a therapeutically effective amount of the nanoparticle composition of any one of claims 15-24 in the preparation of a medicament for the treatment of a disease or disorder in a mammal in need thereof, wherein the disease or disorder is selected from the group consisting of infectious diseases, cancer and proliferative diseases, genetic disesease, autoimmune diseases, diabetes, neurodegenerative diseases, cardio- and reno-vascular diseases, and metabolic diseases.