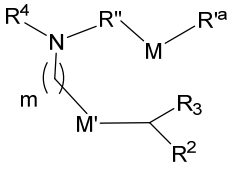
CLAIMS

1. A compound of Formula (A):

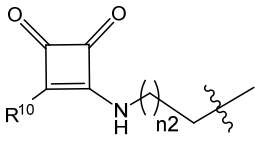


(A), or its N-oxide, or a salt thereof, wherein

m is selected from 5, 6, 7, 8, and 9;

R^2 and R^3 are each independently selected from the group consisting of H, C_{1-14} alkyl, and C_{2-14} alkenyl;

R^4 is selected from $-(CH_2)_nOH$, wherein n is selected from 1, 2, 3, 4, and 5, and



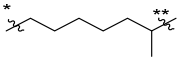
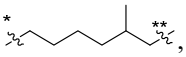
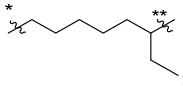
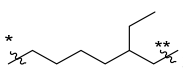
, wherein n2 is selected from 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10; and R^{10} is $-N(R)_2$, wherein each R is independently selected from the group consisting of C_{1-6} alkyl, C_{2-3} alkenyl, and H;

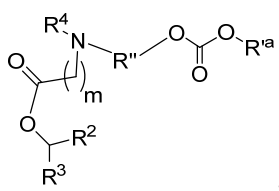
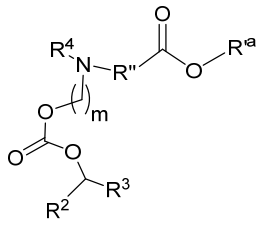
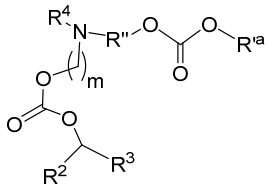
M and M' are each independently selected from –OC(O)O- and -C(O)O-;

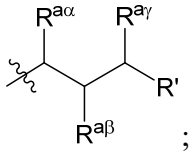
wherein at least one of M and M' is –OC(O)O-;

R'^{a} is C_{1-18} alkyl or C_{2-18} alkenyl; and

R" is a C_3-C_{13} alkylene, optionally substituted with OH.

2. The compound of claim 1, wherein R" is selected from , , , and ; wherein  denotes a point of attachment with N, and  denotes a point of attachment with M.

3. The compound of claim 1 or 2, wherein the compound has one of the following structures: , , .

4. The compound of any one of the preceding claims, wherein R'^{a} is : 

;

wherein  denotes a point of attachment;

$R^{a\alpha}$, $R^{a\beta}$, and $R^{a\gamma}$ are each independently selected from the group consisting of H, C_{1-12} alkyl, and C_{2-12} alkenyl, wherein at least one of $R^{a\alpha}$, $R^{a\beta}$, and $R^{a\gamma}$ is selected from the group consisting of C_{1-12} alkyl and C_{2-12} alkenyl; and

R' is a C_{1-12} alkyl or C_{2-12} alkenyl.

5. The compound of claim 4, wherein $R^{a\beta}$ and $R^{a\gamma}$ are each H and $R^{a\alpha}$ is C_{1-6} alkyl.

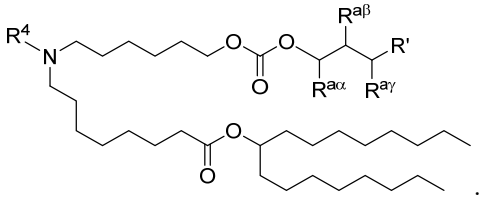
6. The compound of claim 4, wherein $R^{a\alpha}$ and $R^{a\gamma}$ are each H and $R^{a\beta}$ is C_{1-6} alkyl.

7. The compound of claim 6, wherein $R^{a\beta}$ is C_2 alkyl.

8. The compound of claim 4, wherein $R^{a\alpha}$ and $R^{a\beta}$ are each H and $R^{a\gamma}$ is C_{1-6} alkyl.

9. The compound of claim 8, wherein $R^{a\gamma}$ is a C_5 or a C_6 alkyl.

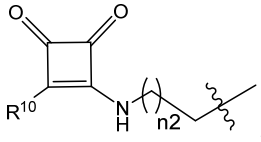
10. The compound of any one of the preceding claims wherein R' is a C_5 or a C_6 alkyl.

11. The compound of any one of the preceding claims, wherein the compound has the following structure: 

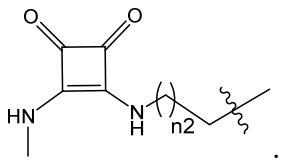
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12. The compound of any one of the preceding claims, wherein R^4 is $-(CH_2)_nOH$.

13. The compound of any one of the preceding claims, wherein R^4 is $-(CH_2)_2OH$.

14. The compound of any one of claims 1 to 11, wherein R^4 is 

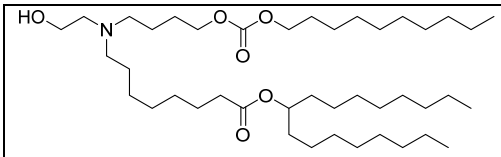
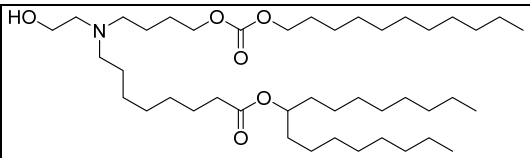
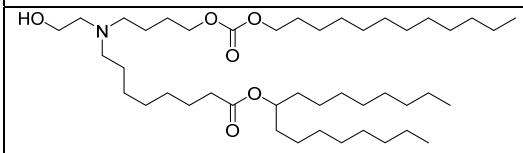
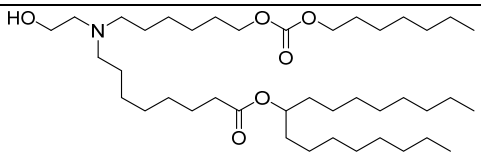
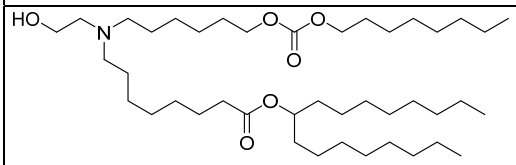
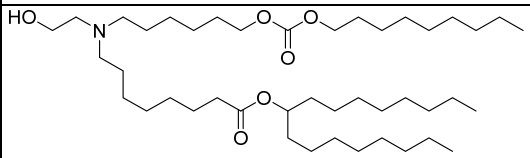
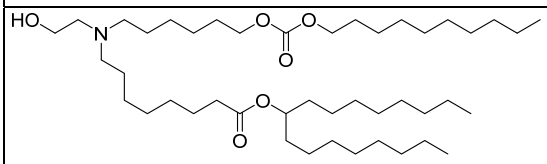
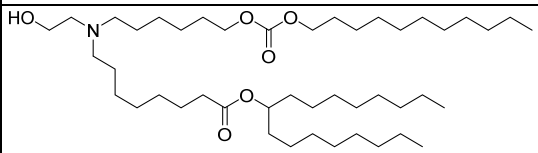
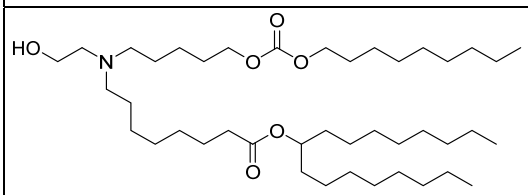
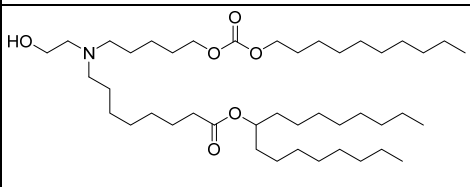
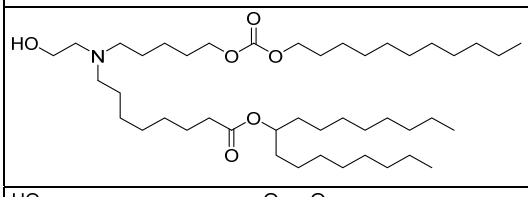
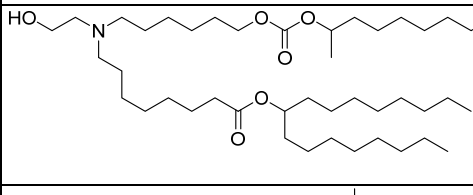
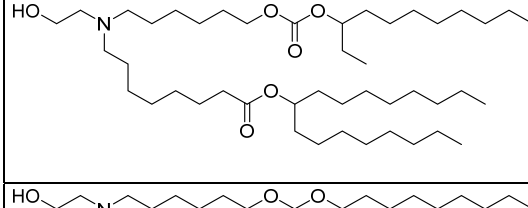
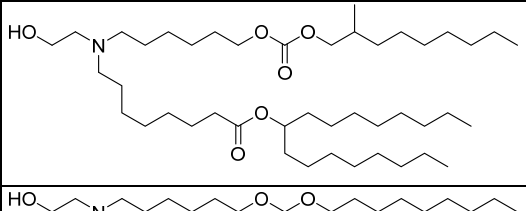
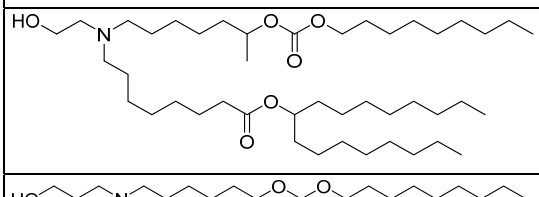
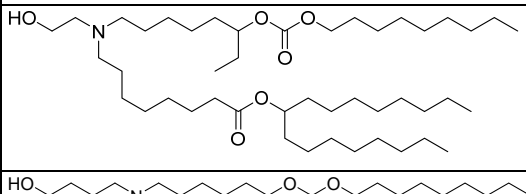
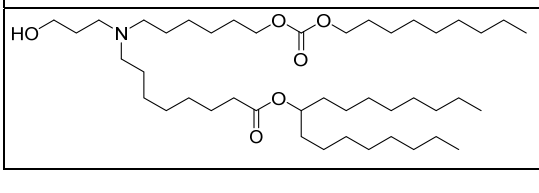
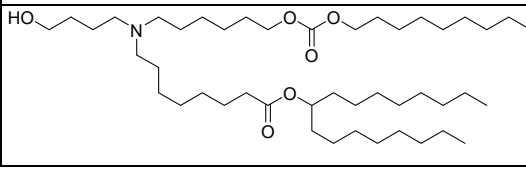
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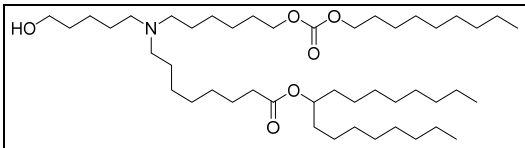
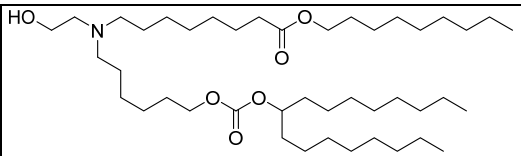
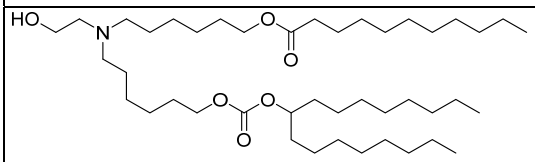
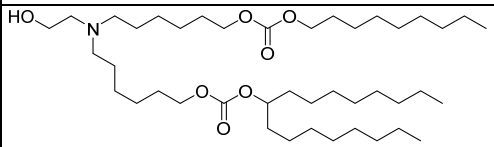
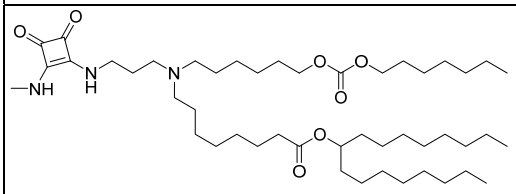
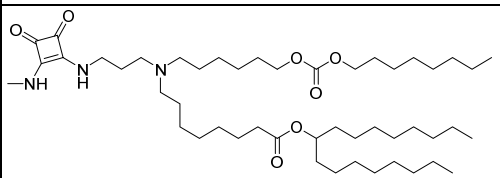
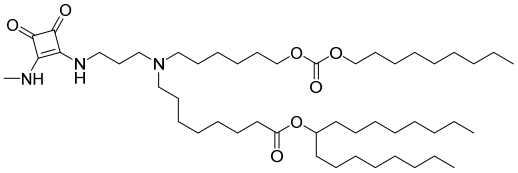
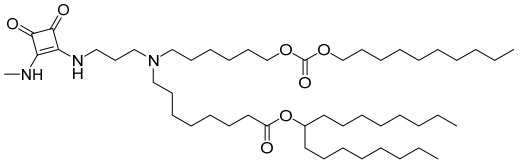
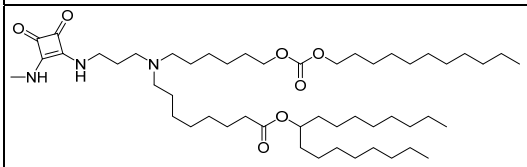
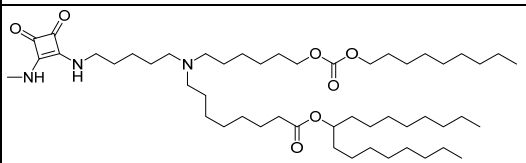
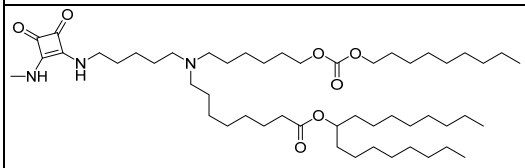
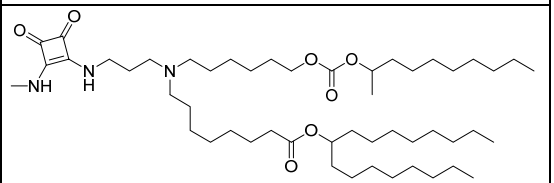
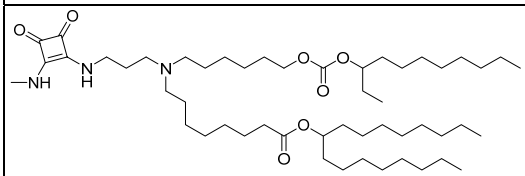
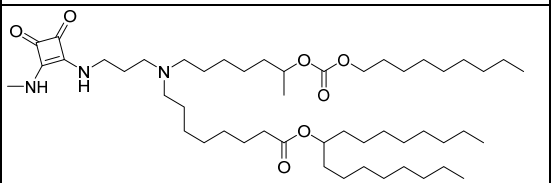
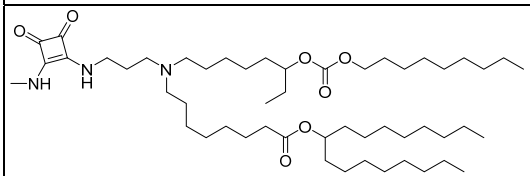
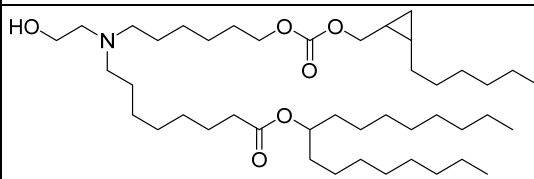
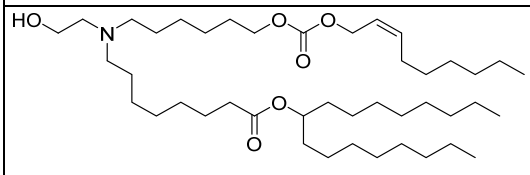
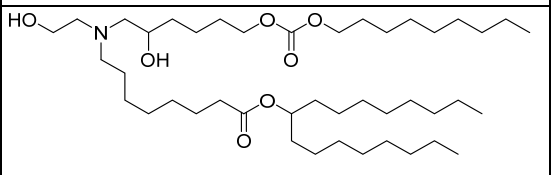
15. The compound of any one of claims 1 to 11, wherein R^4 is 

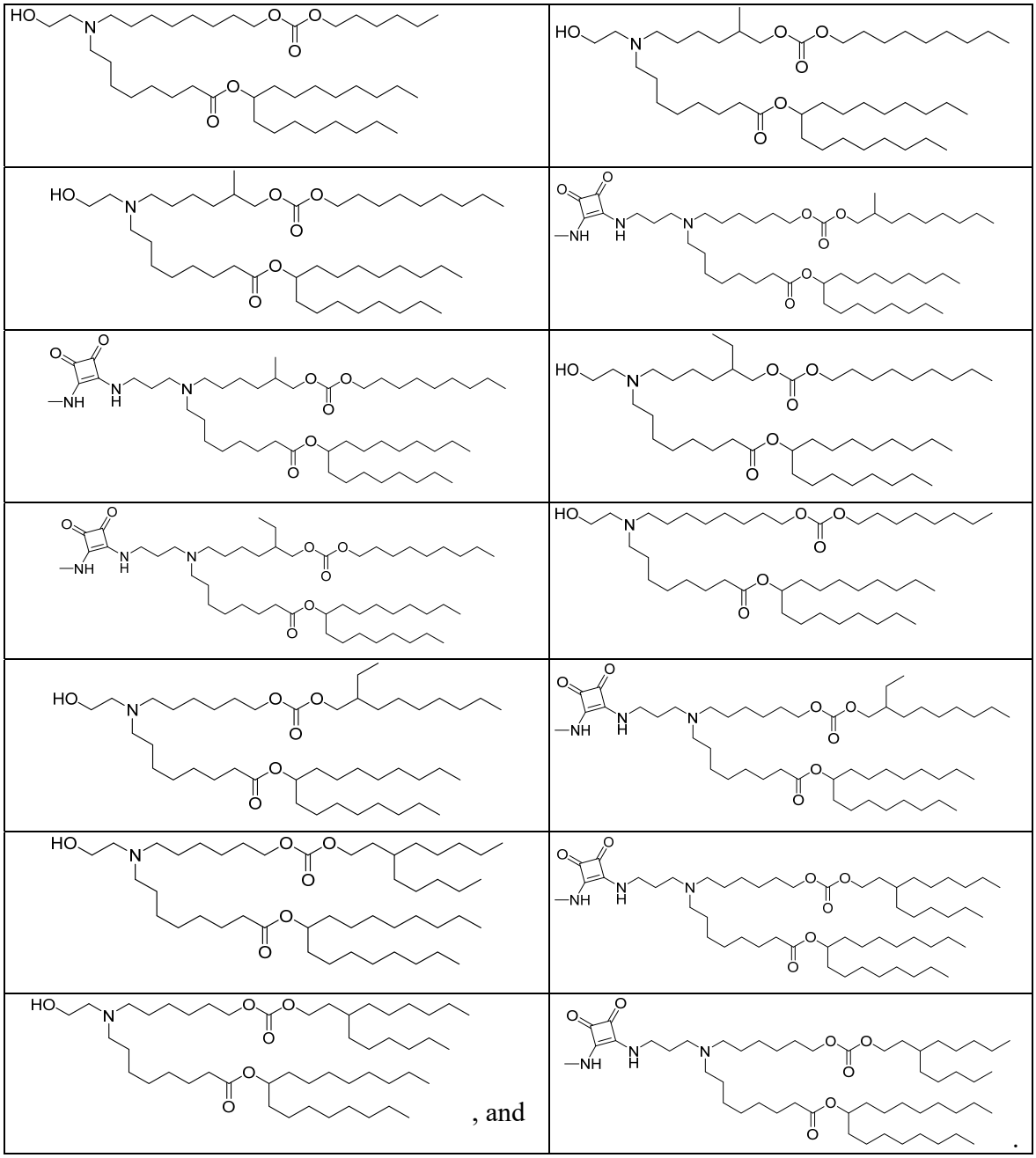
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16. The compound of any one of the preceding claims, wherein n2 is 2 or 4.

17. A compound selected from the group consisting of:

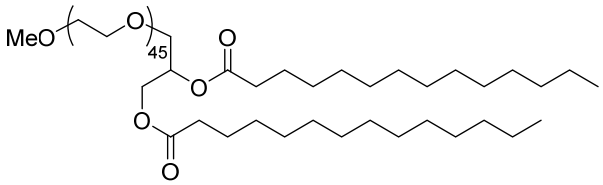


18. An empty lipid nanoparticle (empty LNP) comprising a compound of any one of the preceding claims, a phospholipid, a structural lipid, and a PEG lipid.

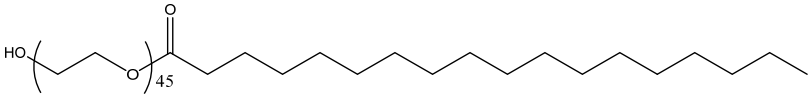
19. The empty LNP of claim 18:

(a) comprising about 40 mol % to about 60 mol % said compound, about 0 mol % to about 20 mol % phospholipid, about 30 mol % to about 50 mol % structural lipid, and about 0 mol % to about 5 mol % PEG lipid;

(b) 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;
(c) wherein the structural lipid is selected from the group consisting of cholesterol, fecosterol, sitosterol, ergosterol, campesterol, stigmasterol, brassicasterol, and mixtures thereof;
(d) 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; and/or
(e) wherein the PEG lipid is selected from PEG_{2k}-DMG and PEG-1:



(PEG_{2k}-DMG),



(PEG-1),

and mixtures thereof.

20. A loaded lipid nanoparticle (loaded LNP), which comprises the empty LNP of claim 18 or 19 and one or more therapeutic and/or prophylactic agents.

21. The loaded LNP of claim 20, wherein the one or more therapeutic and/or prophylactic agents is a nucleic acid.

22. The loaded LNP of claim 21, wherein the nucleic acid is an RNA, and wherein the RNA is selected from the group consisting of a short interfering RNA (siRNA), an asymmetrical interfering RNA (aiRNA), a RNA interference (RNAi) molecule, a microRNA (miRNA), an antagomir, an antisense RNA, a ribozyme, a Dicer-substrate RNA (dsRNA), a small hairpin RNA (shRNA), a messenger RNA (mRNA), and mixtures thereof.

23. The loaded LNP of any one of claims 20 to 22, wherein the RNA is an mRNA.

24. A pharmaceutical composition comprising the loaded LNP of any one of claims 20 to 23 and a pharmaceutically acceptable carrier.

25. Use of the loaded LNP of any of claims 20 to 23, or the pharmaceutical composition of claim 24, in the manufacture of a medicament for delivering a therapeutic and/or prophylactic agent to a cell within a subject and/or to an organ of a subject, wherein the loaded LNP or the pharmaceutical composition is to be administered to the subject.

26. Use of the loaded LNP of any of claims 20 to 23, or the pharmaceutical composition of claim 24, in the manufacture of a medicament for specifically delivering a therapeutic and/or prophylactic agent to an organ of a subject, wherein the loaded LNP or the pharmaceutical composition is to be administered to the subject.

27. Use of the loaded LNP of any of claims 20 to 23, or the pharmaceutical composition of claim 24, in the manufacture of a medicament for producing a polypeptide of interest in a cell within a subject, wherein the loaded LNP or the pharmaceutical composition is to be administered to the subject.

28. Use of the loaded LNP of any of claims 20 to 23, or the pharmaceutical composition of claim 24, in the manufacture of a medicament for treating a disease or disorder in a subject in need thereof, wherein the loaded LNP or the pharmaceutical composition is to be administered to the subject.