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R₁-R₆ independently of one another, are selected from the group consisting of H, —(CH₂)_p-D-Z, an alkyl, an alkenyl, an alkynyl, an aryl, and an alkyl ether group optionally substituted by one or more of an alcohol, an aminoalcohol, an amine, an amide, an ether, a polyether, a polyamide, an ester, a mercaptan, an alkylthio, a urea, a thiourea, a guanidyl, or a carbamoyl group, and wherein at least one of R₁, R₃, R₄ and R₆ is a straight-chain, branched, or cyclic alkyl, alkenyl, alkynyl or aryl group having from about 6 to about 64 carbon atoms; and R₁ and R₄ or R₃ and R₆ may optionally be covalently linked with each other, or with L to form a cyclic moiety;

Z is selected from the group consisting of amine, spermyl, carboxyspermyl, guanidyl, spermidinyl, putricinyl, diaminoalkyl, pyridyl, piperidinyl, pyrrolidinyl, polyamine, amino acid, peptide, and protein;

D is Q or a bond;

A₁ and A₂, independently of one another, are selected from the group consisting of CH₂O, CH₂S, CH₂NH, C(O), C(NH), C(S) and (CH₂)_q;

X is a physiologically acceptable anion;

m, n, r, s, u, v, w and y are 1;

i, j, k, p and t are integers from 0 to about 100;

l is an integer from 3 to about 100;

q is an integer from 1 to about 1000; and

a is the number of positive charges divided by the valence of the anion.

2. The lipid aggregate of claim 1, wherein at least two of R₁, R₃, R₄ and R₆ are a straight-chain, branched, or cyclic alkyl, alkenyl, alkynyl or aryl groups having from about 6 to about 64 carbon atoms.

3. The lipid aggregate of claim 1, wherein at least two of R₁, R₃, R₄ and R₆ are a straight-chain, branched, or cyclic alkyl, alkenyl, alkynyl or aryl groups having from about 8 to about 24 carbon atoms.

4. The lipid aggregate of claim 1, wherein

A₁ and A₂, independently of one another, are selected from the group consisting of CH₂O, CH₂S, CH₂NH, C(O), C(NH), C(S) and (CH₂)_q;

i, j, k, p and t are integers from 1 to about 100;

l is an integer from 3 to about 100; and

q is an integer from 1 to about 1000.

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5. The lipid aggregate of claim 1, where L is (CH₂)₁ or {(CH₂)_i-Y-(CH₂)_j}, wherein Y is selected from the group consisting of CH₂, an ether, a polyether, an amide, a polyamide, an ester, a sulfide, a urea, a thiourea, a guanidyl, a carbamoyl, a carbonate, and a secondary amino group; j and k are integers from 1 to 4 and l is 3 or 4.

6. The lipid aggregate of claim 1, wherein at least two of R₁-R₆ are —(CH₂)_p-D-Z groups.

7. The lipid aggregate of claim 1, where L is (CH₂)₁, where l is 3 or 4.

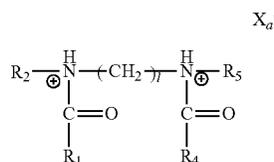
8. The lipid aggregate of claim 1, where R₁ and R₄ are straight-chain alkenyl having 17 carbon atoms.

9. The lipid aggregate of claim 1, where R₂ and R₅ are —(CH₂)_p-D-Z where p is 1-4, D is a bond and Z is amine.

10. The lipid aggregate of claim 1, where R₃ and R₆ are H.

11. The lipid aggregate of claim 1, where A₁ and A₂ are C(O).

12. A compound or polycation having the formula:



wherein

R₁ and R₄ are straight-chain alkenyl having 17 carbon atoms;

R₂ and R₅ are —(CH₂)_p-NH₂ where p is 1-4; and

X_a⁻ is a physiologically acceptable anion.

13. The lipid aggregate of claim 1, further comprising at least one neutral lipid.

14. The lipid aggregate of claim 13, wherein the neutral lipid is DOPE, DOPC or cholesterol.

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