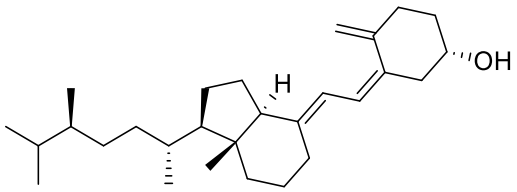
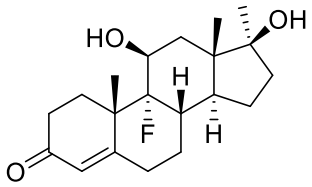
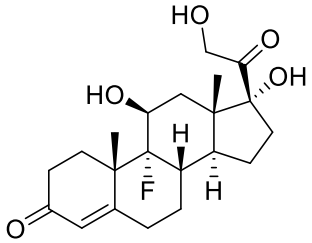
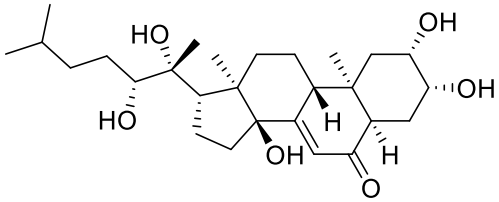
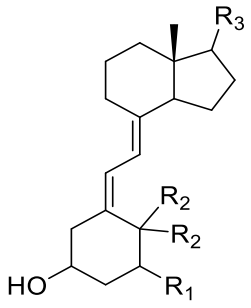
| | | |
|---|---|---|
| | | dimethyl-6H-benz[c]indeno[5,4-e]oxepin-6-one |
| 512 | 511-28-4 | <br>**Vitamin D4** (1S,3Z)-3-[(2E)-2-[(1R,3aS,7aR)-1-[(2R,5S)-5,6-dimethylheptan-2-yl]-7a-methyl-2,3,3a,5,6,7-hexahydro-1H-inden-4-ylidene]ethylidene]-4-methylidenecyclohexan-1-ol |
| 532 | 76-43-7 | <br>**Fluoxymesterone** (8S,9R,10S,11S,13S,14S,17S)-9-fluoro-11,17-dihydroxy-10,13,17-trimethyl-1,2,6,7,8,11,12,14,15,16-decahydrocyclopenta[a]phenanthren-3-one |
| 534 | 127-31-1 | <br>**Fludrocortisone** (8S,9R,10S,11S,13S,14S,17R)-9-fluoro-11,17-dihydroxy-17-(2-hydroxyacetyl)-10,13-dimethyl-1,2,6,7,8,11,12,14,15,16-decahydrocyclopenta[a]phenanthren-3-one |
| 538 | 13408-56-5 | <br>**Ponasterone A** (2S,3R,5R,9R,10R,13R,14S,17S)-17-[(2R,3R)-2,3-dihydroxy-6-methylheptan-2-yl]-2,3,14-trihydroxy-10,13-dimethyl-2,3,4,5,9,11,12,15,16,17-decahydro-1H-cyclopenta[a]phenanthren-6-one |

WHAT IS CLAIMED IS:

1. Use of a lipid composition in the manufacture of an agent for delivering nucleic acid, wherein the lipid composition consists of one or more compounds of Formula (I), or salts, hydrates or solvates thereof:




(I),

wherein:

$R_1$ is hydrogen or hydroxyl;

each $R_2$ is hydrogen, or two $R_2$ together with the carbon atom to which they are attached form a carbon-carbon double bond, or form a straight or branched $C_{2-20}$ alkenyl;

$R_3$ is straight or branched $C_{1-20}$ alkyl optionally substituted by one or more hydroxyls, straight or branched $C_{1-20}$ alkyl optionally substituted by one or more groups selected from hydroxyl or cycloalkyl, straight or branched $C_{2-20}$ alkenyl optionally substituted by one or more groups selected from hydroxyl or cycloalkyl, or straight or branched $C_{1-20}$ heteroalkyl optionally substituted by one or more hydroxyls.

2. The use of claim 1, wherein the lipid composition comprises one or more compounds selected from the group consisting of:

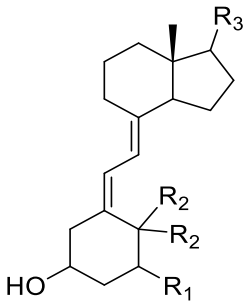
| **Lipid Compound No.** | **Product Name** |
|---|---|
| 512 | Vitamin D4 |
| 540 | Maxacalcitol |
| 545 | Paricalcitol |
| 554 | Calcipotriol |
| 569 | Doxercalciferol |

| | |
|---|---|
| 570 | 1α, 25-dihydroxyvitamin D2 |
| 571 | Calcifediol |

or salts, hydrates or solvates thereof.

3. The use of any one of the preceding claims, wherein the nucleic acid comprises DNA or RNA, optionally, the DNA is selected from coding DNA or non-coding DNA, the RNA is selected from antisense nucleic acid, mRNA, lncRNA or small RNA.

4. A pharmaceutical composition comprising a lipid composition and a nucleic acid, wherein the lipid composition consists of one or more compounds of Formula (I), or salts, hydrates or solvates thereof:




(I),

wherein:

$R_1$ is hydrogen or hydroxyl;

each $R_2$ is hydrogen, or two $R_2$ together with the carbon atom to which they are attached form a straight or branched $C_{2-20}$ alkenyl;

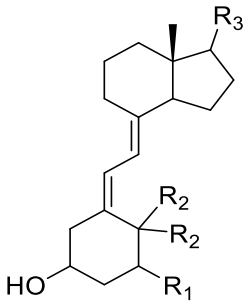
$R_3$ is straight or branched $C_{1-20}$ alkyl optionally substituted by one or more hydroxyls, straight or branched $C_{1-20}$ alkyl optionally substituted by one or more groups selected from hydroxyl or cycloalkyl, straight or branched $C_{2-20}$ alkenyl optionally substituted by one or more groups selected from hydroxyl or cycloalkyl, or straight or branched $C_{1-20}$ heteroalkyl optionally substituted by one or more hydroxyls.

5. The pharmaceutical composition of claim 4, wherein the nucleic acid is used for treating disease.

6. The pharmaceutical composition of claim 5, wherein the nucleic acid is used for treating cancer, inflammation, fibrotic disease, autoimmune or autoinflammatory disease, bacterial infection, behavioural and psychiatric disorder, blood disease, chromosomal disease, congenital and hereditary diseases, connective tissue disease, digestive disease, ear nose throat disease, endocrine disease, environmental disease, eye disease, female reproductive disease, fungal infection, heart disease, hereditary cancer syndrome, disease of the immune system, kidney and urinary disease, lung disease, male reproductive disease, metabolic disorder, mouth disease, musculoskeletal disease, myelodysplastic syndrome, nutritional disease, parasitic disease, skin disease or viral infection.

7. A pharmaceutical composition comprising a lipid composition and a nucleic acid, wherein the lipid composition consists of one or more compounds selected from the group consisting of lipids 512, 540, 545, 554, 569, 570, and 571, or salts, hydrates or solvates thereof.

8. A kit comprising one or more compounds of Formula (I), or salts, hydrates or solvates thereof positioned in a first container:




(I),

and a nucleic acid positioned in a second container;

wherein:

$R_1$ is hydrogen or hydroxyl;

each $R_2$ is hydrogen, or two $R_2$ together with the carbon atom to which they are attached form a straight or branched $C_{2\text{-}20}$ alkenyl;

$R_3$ is straight or branched $C_{1-20}$ alkyl optionally substituted by one or more hydroxyls, straight or branched $C_{1-20}$ alkyl optionally substituted by one or more groups selected from hydroxyl or cycloalkyl, straight or branched $C_{2-20}$ alkenyl optionally substituted by one or more groups selected from hydroxyl or cycloalkyl, or straight or branched $C_{1-20}$ heteroalkyl optionally substituted by one or more hydroxyls.

9. A kit, comprising:

one or more compounds or pharmaceutically acceptable salts, hydrates or solvates thereof positioned in a first container, and a nucleic acid positioned in a second container, wherein the one or more compounds selected from the group consisting of lipids 512, 540, 545, 554, 569, 570, and 571.