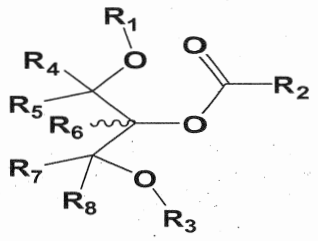
CLAIMS

1. A compound according to the structure of formula I:



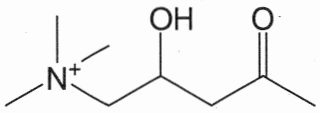
(I)

wherein:

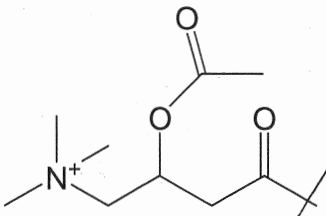
R_1 and R_2 are the same or different and selected from an alkyl or alkenyl hydrocarbon chain selected from the group consisting of: $CH_3(CH_2)_3$-, $CH_3(CH_2)_5$-, $CH_3(CH_2)_7$-, $CH_3(CH_2)_9$-, $CH_3(CH_2)_{11}$-, $CH_3(CH_2)_{13}$-, $CH_3(CH_2)_{15}$-, $CH_3(CH_2)_{17}$-, $CH_3(CH_2)_{19}$-, $CH_3(CH_2)_{21}$-, $CH_3(CH_2)_{23}$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2(CH=CH)$-, $CH_3(CH_2)_3(CH=CH)$-, $CH_3(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7(CH=CH)$-, $CH_3(CH_2)_9(CH=CH)$-, $CH_3(CH_2)_{11}(CH=CH)$-, $CH_3(CH_2)_{13}(CH=CH)$-, $CH_3(CH_2)_{15}(CH=CH)$-, $CH_3(CH_2)_{17}(CH=CH)$-, $CH_3(CH_2)_{19}(CH=CH)$-, $CH_3(CH_2)_{21}(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_5CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4(CH=CHCH_2)_2(CH_2)_6$-, $CH_3CH_2(CH=CHCH_2)_3(CH_2)_6$-, $CH_3(CH_2)_4(CH=CHCH_2)_4(CH_2)_2$-, $CH_3CH_2(CH=CHCH_2)_5(CH_2)_2$-, $CH_3(CH_2)_7CH=CH(CH_2)_{11}$, and $CH_3CH_2(CH=CHCH_2)_6CH_2$-;

R_3 is selected from the group consisting of carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, lipoic acid, dihydrolipoic acid, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

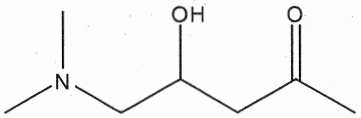
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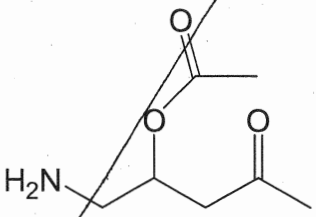
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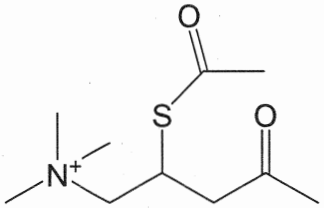
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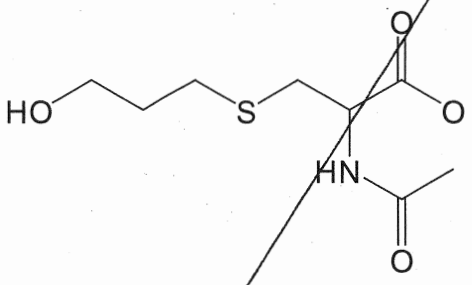
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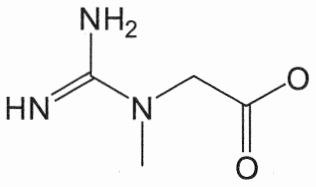
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7



8



R_4 and R_5 are independently hydrogen or lower alkyl;

R_6 is hydrogen or lower alkyl; and

R_7 and R_8 are independently hydrogen or lower alkyl,

including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

2. The compound of claim 1, wherein R_2 is $CH_3CH_2(CH=CHCH_2)_6CH_2$-, preferably wherein said compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7,10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z, 7Z, 10Z, 13Z, 16Z, 19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z, 7Z, 10Z, 13Z, 16Z, 19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

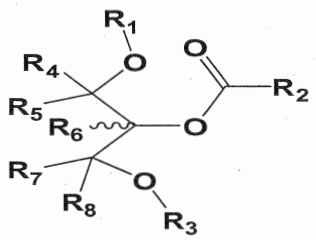
3. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of claim 1 or 2.

4. Use of a compound as defined in claim 1 or 2 in the manufacture of a medicament for treating or preventing diseases of aging associated with increased membrane cholesterol, increased amyloid or decreased plasmalogen levels.

5. The use of claim 4, wherein the diseases of aging are selected from the group consisting of: neurodegeneration, cognitive impairment, dementia, cancer, and vascular disease.

6. The use of claim 5, wherein the neurodegeneration disease is selected from the group consisting of: Alzheimer's disease, Parkinson's disease and age-related macular degeneration, or wherein the cancer is selected from the group consisting of: prostate, lung, breast, ovarian, and kidney cancer, or wherein the vascular disease is selected from the group consisting of: atherosclerosis and hypercholesterolemia.

7. Use of a compound of formula I:

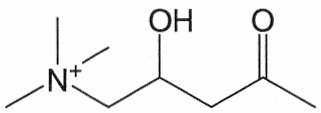


(I)

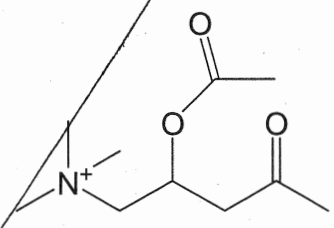
wherein

R_3 is selected from the group consisting of fatty acids, carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, phosphocholine, lipoic acid, dihydrolipoic acid, phosphoethanolamine, phosphoserine, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

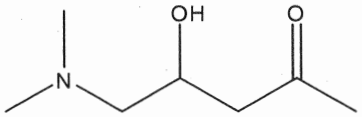
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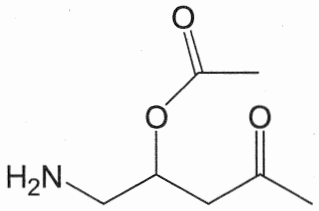
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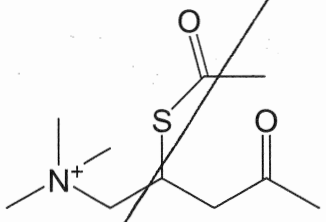
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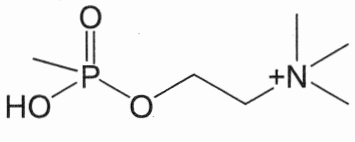
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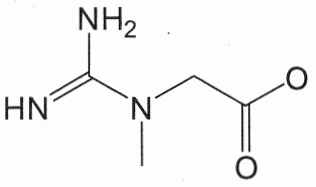


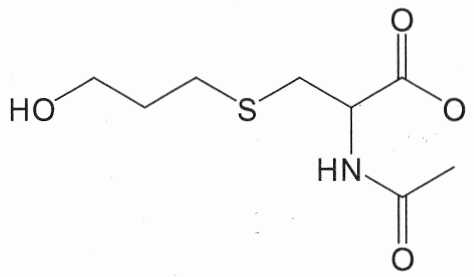
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8



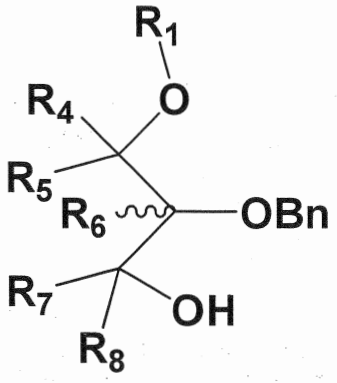


and R_1, R_2 and R_4 to R_8 are as defined in claim 1, including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof in the manufacture of a medicament for treating or preventing diseases of the aging mediated by plasmalogen deficiency by increasing PlsEtn levels to above control levels in either PlsEtn deficient or PlsEtn sufficient systems, or for treating or preventing a disorder resulting from abnormal genetic expression of cholesterol transport proteins.

8. The use of claim 7, wherein R_2 is $CH_3CH_2(CH=CHCH_2)_6CH_2$-, preferably wherein the compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7,10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z, 7Z, 10Z, 13Z, 16Z, 19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z, 7Z, 10Z, 13Z, 16Z, 19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

9. The use of claim 7 or 8, wherein the cholesterol transport protein is apolipoprotein E.

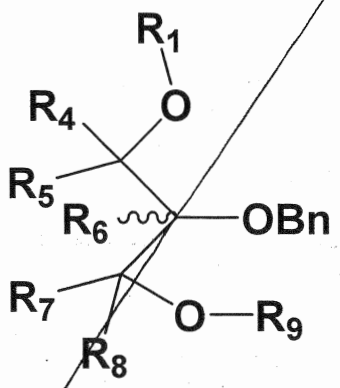
10. A process for preparing a compound according to the structure of formula II:



(II)

wherein R_1 and R_4 to R_8 are as defined in claim 1, and including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof,

said process comprising reacting a compound of formula III:



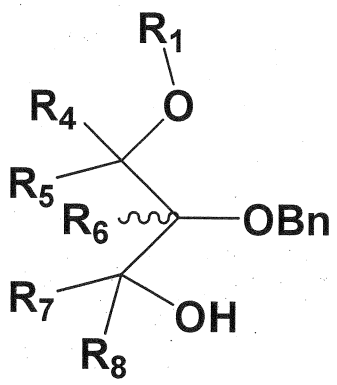
(III)

wherein R_9 is a blocking group, in a suitable solvent with tetrabutylammonium fluoride (TBAF) under conditions to form said compound of formula II, and

optionally purifying said compound of formula II.

11. The process of claim 10, wherein said blocking group is a silane blocking group, preferably wherein the silane blocking group is a tert-butyldimethylsilyl halide, or wherein said solvent comprises dimethylformamide (DMF), or wherein said reaction is carried out at a temperature of 0 to 26 °C, preferably wherein said reaction is carried out at about 20 °C, or wherein said reaction is allowed to proceed for up to 20 hours.

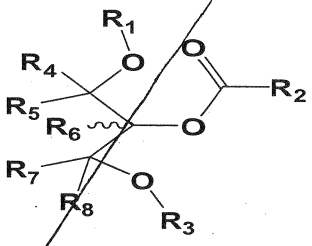
12. A compound according to the structure of formula II:



(II)

wherein R_1 and R_4 to R_8 are as defined in claim 1, including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

13. Use of a compound of formula I:



(I)

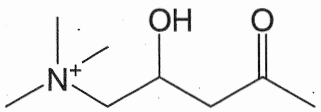
in the manufacture of a medicament for treating or preventing a neurodegeneration disease selected from the group consisting of Alzheimer's disease, Parkinson's disease and age-related macular degeneration, or for treating or preventing a vascular disease selected from the group consisting of atherosclerosis and hypercholesterolemia, wherein

R_1 and R_2 are the same or different and selected from an alkyl or alkenyl hydrocarbon chain selected from the group consisting of: $CH_3(CH_2)_3$-, $CH_3(CH_2)_5$-, $CH_3(CH_2)_7$-, $CH_3(CH_2)_9$-, $CH_3(CH_2)_{11}$-, $CH_3(CH_2)_{13}$-, $CH_3(CH_2)_{15}$-, $CH_3(CH_2)_{17}$-, $CH_3(CH_2)_{19}$-, $CH_3(CH_2)_{21}$-, $CH_3(CH_2)_{23}$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-,

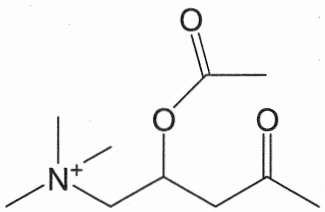
$CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2(CH=CH)$-, $CH_3(CH_2)_3(CH=CH)$-, $CH_3(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7(CH=CH)$-, $CH_3(CH_2)_9(CH=CH)$-, $CH_3(CH_2)_{11}(CH=CH)$-, $CH_3(CH_2)_{13}(CH=CH)$-, $CH_3(CH_2)_{15}(CH=CH)$-, $CH_3(CH_2)_{17}(CH=CH)$-, $CH_3(CH_2)_{19}(CH=CH)$-, $CH_3(CH_2)_{21}(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_5CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4(CH=CHCH_2)_2(CH_2)_6$-, $CH_3CH_2(CH=CHCH_2)_3(CH_2)_6$-, $CH_3(CH_2)_4(CH=CHCH_2)_4(CH_2)_2$-, $CH_3CH_2(CH=CHCH_2)_5(CH_2)_2$-, $CH_3(CH_2)_7CH=CH(CH_2)_{11}$, and $CH_3CH_2(CH=CHCH_2)_6CH_2$-;

R_3 is selected from the group consisting of fatty acids, carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, phosphocholine, lipoic acid, dihydrolipoic acid, phosphoethanolamine, phosphoserine, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

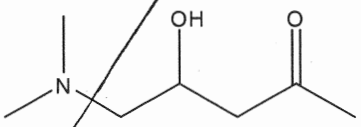
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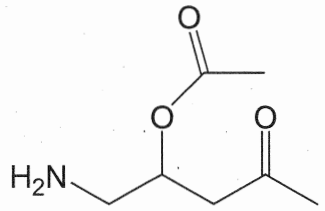
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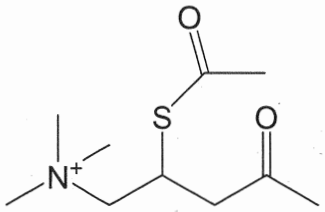


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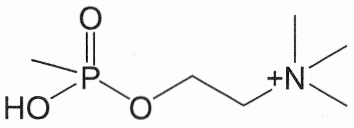


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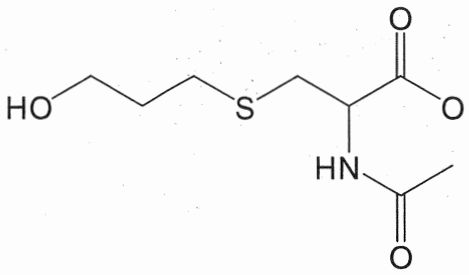
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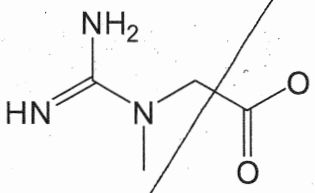


7



8





R_4 and R_5 are independently hydrogen or lower alkyl;

R_6 is hydrogen or lower alkyl; and

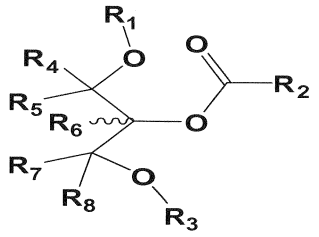
R_7 and R_8 are independently hydrogen or lower alkyl,

including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

14. The use of claim 13, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-, preferably wherein the compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7,10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z, 7Z, 10Z, 13Z, 16Z, 19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z, 7Z, 10Z, 13Z, 16Z, 19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

CLAIMS

1. A compound according to the structure of formula I:



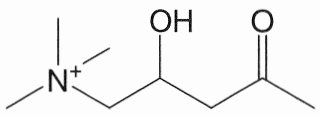
(I)

wherein:

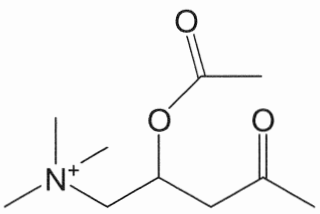
R_1 and R_2 are the same or different and selected from an alkyl or alkenyl hydrocarbon chain selected from the group consisting of: $CH_3(CH_2)_3$-, $CH_3(CH_2)_5$-, $CH_3(CH_2)_7$-, $CH_3(CH_2)_9$-, $CH_3(CH_2)_{11}$-, $CH_3(CH_2)_{13}$-, $CH_3(CH_2)_{15}$-, $CH_3(CH_2)_{17}$-, $CH_3(CH_2)_{19}$-, $CH_3(CH_2)_{21}$-, $CH_3(CH_2)_{23}$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2(CH=CH)$-, $CH_3(CH_2)_3(CH=CH)$-, $CH_3(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7(CH=CH)$-, $CH_3(CH_2)_9(CH=CH)$-, $CH_3(CH_2)_{11}(CH=CH)$-, $CH_3(CH_2)_{13}(CH=CH)$-, $CH_3(CH_2)_{15}(CH=CH)$-, $CH_3(CH_2)_{17}(CH=CH)$-, $CH_3(CH_2)_{19}(CH=CH)$-, $CH_3(CH_2)_{21}(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_5CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4(CH=CHCH_2)_2(CH_2)_6$-, $CH_3CH_2(CH=CHCH_2)_3(CH_2)_6$-, $CH_3(CH_2)_4(CH=CHCH_2)_4(CH_2)_2$-, $CH_3CH_2(CH=CHCH_2)_5(CH_2)_2$-, $CH_3(CH_2)_7CH=CH(CH_2)_{11}$, and $CH_3CH_2(CH=CHCH_2)_6CH_2$-;

R_3 is selected from the group consisting of carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, lipoic acid, dihydrolipoic acid, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

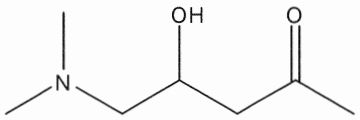
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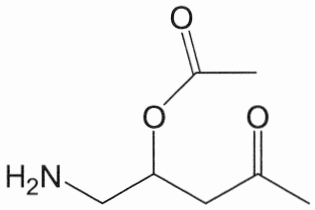
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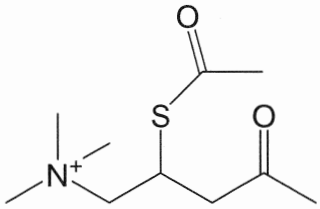
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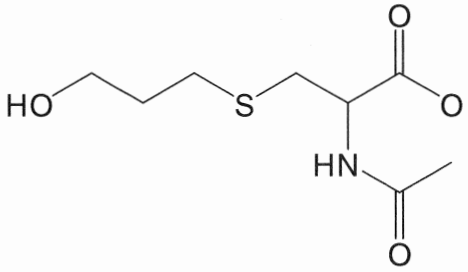
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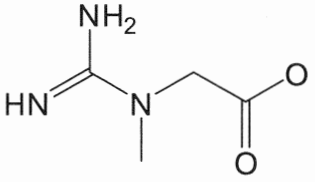
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7



8



R_4 and R_5 are independently hydrogen or lower alkyl;

R_6 is hydrogen or lower alkyl; and

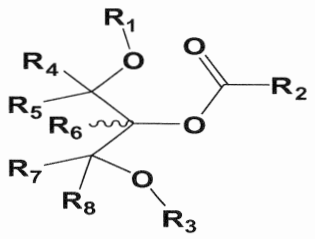
R_7 and R_8 are independently hydrogen or lower alkyl,

including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

2. The compound of claim 1, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

3. The compound of claim 1, wherein said compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7,10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z,7Z,10Z,13Z,16Z,19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z,7Z,10Z,13Z,16Z,19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

4. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of formula I:



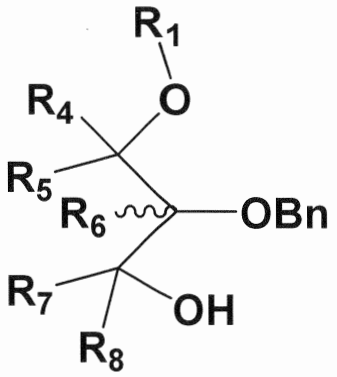
(I)

wherein R_1 to R_8 are as defined in claim 1, and including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

5. The pharmaceutical composition of claim 4, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

6. The pharmaceutical composition of claim 4, wherein the compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7, 10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z,7Z,10Z,13Z,16Z,19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z,7Z,10Z,13Z,16Z,19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

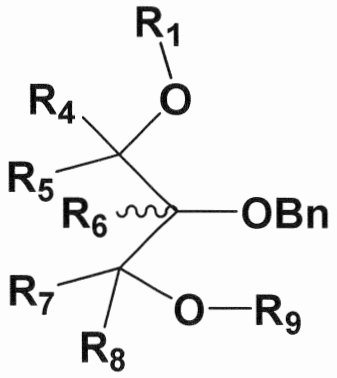
7. A process for preparing a compound according to the structure of formula II:



(II)

wherein R_1 and R_4 to R_8 are as defined in claim 1, and including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof,

said process comprising reacting a compound of formula III:



(III)

wherein R_9 is a blocking group, in a suitable solvent with tetrabutylammonium fluoride (TBAF) under conditions to form said compound of formula II, and

optionally purifying said compound of formula II.

8. The process of claim 7, wherein said blocking group is a silane blocking group.

9. The process of claim 8, wherein the silane blocking group is a tert-butyldimethylsilyl halide.

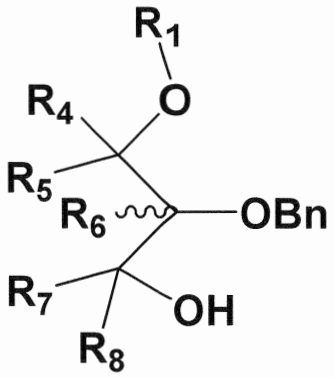
10. The process of claim 7, wherein said solvent comprises dimethylformamide (DMF).

11. The process of claim 7, wherein said reaction is carried out at a temperature of 0 to 26 °C.

12. The process of claim 11, wherein said reaction is carried out at about 20 °C.

13. The process of claim 11, wherein said reaction is allowed to proceed for up to 20 hours.

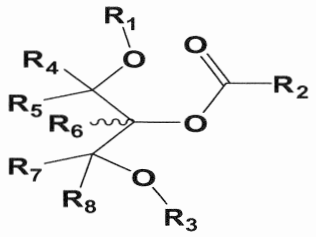
14. A compound according to the structure of formula II:



(II)

wherein R_1 and R_4 to R_8 are as defined in claim 1, including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

15. Use of a compound of formula I:



(I)

wherein R_1 to R_8 are as defined in claim 1, including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof, or a pharmaceutical composition comprising said compound admixed with a pharmaceutically acceptable carrier, for the manufacture of a medicament for treating or preventing diseases of aging associated with increased membrane cholesterol, increased amyloid or decreased plasmalogen levels, wherein the diseases of aging are selected from the group consisting of: neurodegeneration, cognitive impairment, dementia, cancer, and vascular disease.

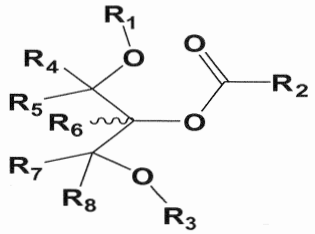
16. The use of claim 15, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

17. The use of claim 15 or 16, wherein the neurodegeneration disease is selected from the group consisting of: Alzheimer's disease, Parkinson's disease and age-related macular degeneration.

18. The use of claim 15 or 16, wherein the cancer is selected from the group consisting of: prostate, lung, breast, ovarian, and kidney cancer.

19. The use of claim 15 or 16, wherein the vascular disease is selected from the group consisting of: atherosclerosis and hypercholesterolemia.

20. Use of a compound of formula I:

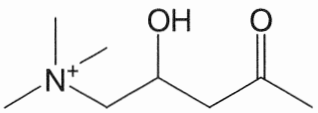


(I)

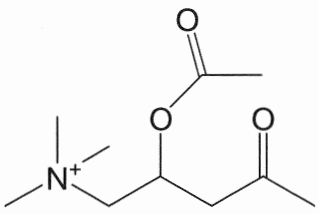
wherein

R_3 is selected from the group consisting of fatty acids having a chain of 4 to 28 carbons, carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, phosphocholine, lipoic acid, dihydrolipoic acid, phosphoethanolamine, phosphoserine, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

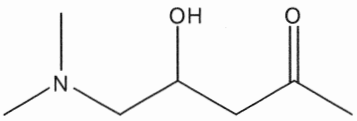
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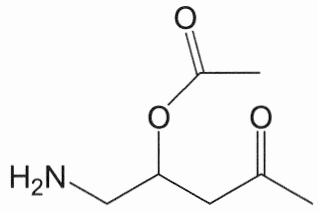
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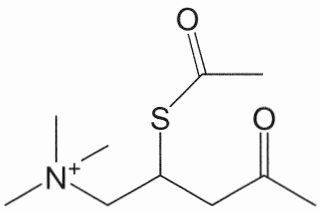


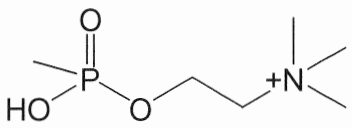
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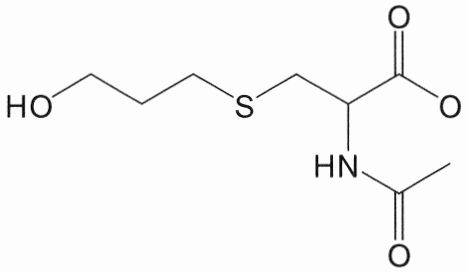
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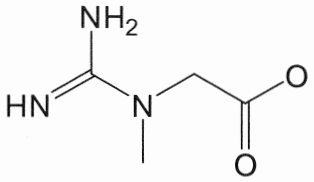




7



8



and R_1, R_2 and R_4 to R_8 are as defined in claim 1, including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof, or a pharmaceutical composition comprising said compound admixed with a pharmaceutically acceptable carrier, for the manufacture of a medicament for treating or preventing diseases of the aging mediated by plasmalogen deficiency, wherein the diseases of aging are selected from the group consisting of: neurodegeneration, cognitive impairment, dementia, cancer, and vascular disease, by increasing PlsEtn levels to above control levels in either PlsEtn deficient or PlsEtn sufficient systems.

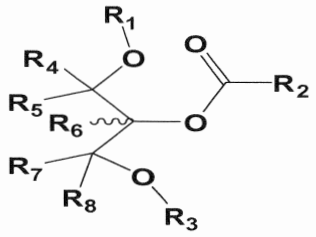
21. The use of claim 20, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

22. The use of claim 20 or 21, wherein the neurodegeneration disease is selected from the group consisting of: Alzheimer's disease, Parkinson's disease and age-related macular degeneration.

23. The use of claim 20 or 21, wherein the cancer is selected from the group consisting of: prostate, lung, breast, ovarian, and kidney cancer.

24. The use of claim 20 or 21, wherein the vascular disease is selected from the group consisting of: atherosclerosis and hypercholesterolemia.

25. Use of a compound of formula I:

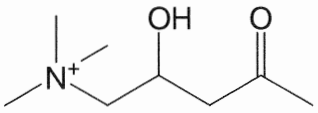


(I)

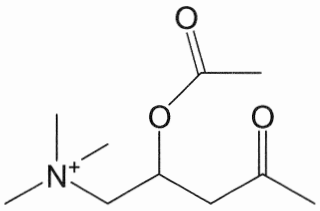
wherein

R_3 is selected from the group consisting of fatty acids having a chain of 4 to 28 carbons, carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, phosphocholine, lipoic acid, dihydrolipoic acid, phosphoethanolamine, phosphoserine, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

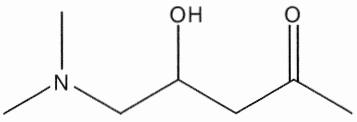
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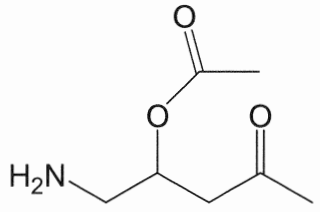
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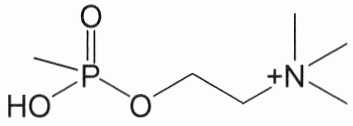


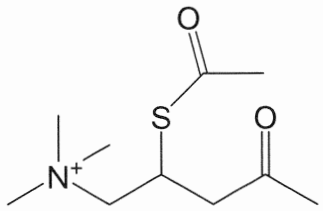
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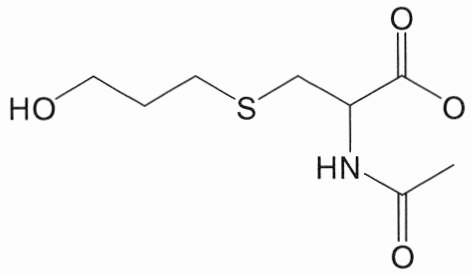
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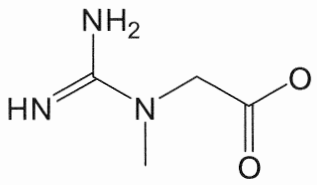




7



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and R_1, R_2 and R_4 to R_8 are as defined in claim 1, including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof, or a pharmaceutical composition comprising said compound admixed with a pharmaceutically acceptable carrier, for the manufacture of a medicament for treating or preventing a disorder resulting from abnormal genetic expression of cholesterol transport proteins, wherein the disorder is selected from the group consisting of: neurodegeneration, cognitive impairment, dementia, cancer, and vascular disease.

26. The use of claim 25, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

27. The use of claim 25 or 26, wherein the cholesterol transport protein is apolipoprotein E.

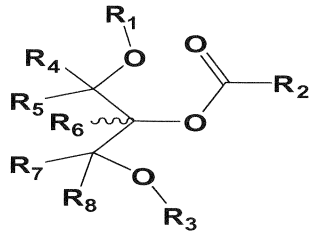
28. The use of any one of claims 25 to 27, wherein the neurodegeneration disease is selected from the group consisting of: Alzheimer's disease, Parkinson's disease and age-related macular degeneration.

29. The use of any one of claims 25 to 27, wherein the cancer is selected from the group consisting of: prostate, lung, breast, ovarian, and kidney cancer.

30. The use of any one of claims 25 to 27, wherein the vascular disease is selected from the group consisting of: atherosclerosis and hypercholesterolemia.

31. The use of any one of claims 15 to 30, wherein the compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7, 10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z,7Z,10Z,13Z,16Z,19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z,7Z,10Z,13Z,16Z,19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

32. Use of a compound of formula I:



(I)

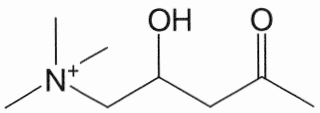
for the manufacture of a medicament for treating or preventing a neurodegeneration disease selected from the group consisting of Alzheimer's disease, Parkinson's disease and age-related macular degeneration, wherein

R_1 and R_2 are the same or different and selected from an alkyl or alkenyl hydrocarbon chain selected from the group consisting of: $CH_3(CH_2)_3$-, $CH_3(CH_2)_5$-, $CH_3(CH_2)_7$-, $CH_3(CH_2)_9$-, $CH_3(CH_2)_{11}$-, $CH_3(CH_2)_{13}$-, $CH_3(CH_2)_{15}$-, $CH_3(CH_2)_{17}$-, $CH_3(CH_2)_{19}$-, $CH_3(CH_2)_{21}$-, $CH_3(CH_2)_{23}$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-, $CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_7$-, $CH_3CH_2(CH=CH)$-, $CH_3(CH_2)_3(CH=CH)$-, $CH_3(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7(CH=CH)$-, $CH_3(CH_2)_9(CH=CH)$-, $CH_3(CH_2)_{11}(CH=CH)$-, $CH_3(CH_2)_{13}(CH=CH)$-, $CH_3(CH_2)_{15}(CH=CH)$-, $CH_3(CH_2)_{17}(CH=CH)$-, $CH_3(CH_2)_{19}(CH=CH)$-, $CH_3(CH_2)_{21}(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_5CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_7CH=CH(CH_2)_5(CH=CH)$-,

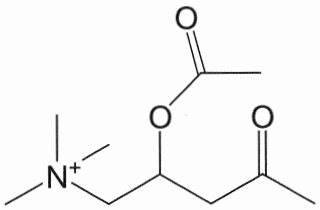
$CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$,
$CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_5(CH=CH)$-, $CH_3(CH_2)_3CH=CH(CH_2)_7$-,
$CH_3(CH_2)_5CH=CH(CH_2)_7$-, $CH_3(CH_2)_7CH=CH(CH_2)_7$-, $CH_3(CH_2)_4(CH=CHCH_2)_2(CH_2)_6$-,
$CH_3CH_2(CH=CHCH_2)_3(CH_2)_6$-, $CH_3(CH_2)_4(CH=CHCH_2)_4(CH_2)_2$-,
$CH_3CH_2(CH=CHCH_2)_5(CH_2)_2$-, $CH_3(CH_2)_7CH=CH(CH_2)_{11}$, and $CH_3CH_2(CH=CHCH_2)_6CH_2$-;

R_3 is selected from the group consisting of fatty acids having a chain of 4 to 28 carbons, carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, phosphocholine, lipoic acid, dihydrolipoic acid, phosphoethanolamine, phosphoserine, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

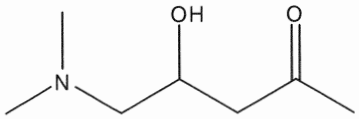
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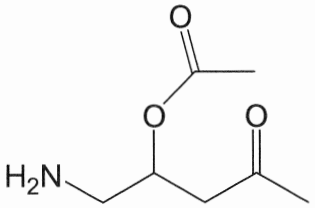
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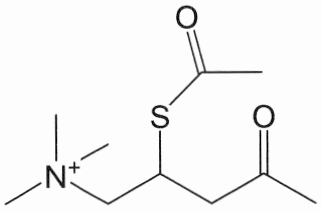
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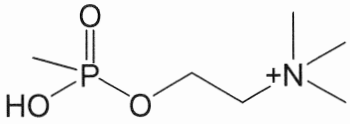
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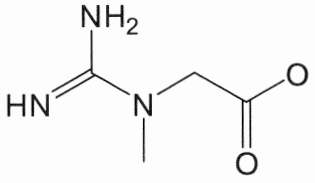


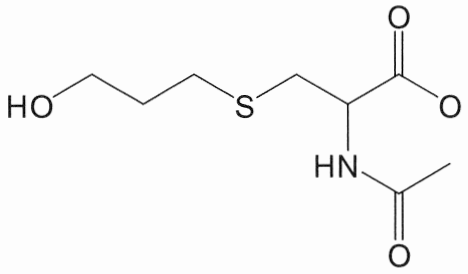
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7

8





R_4 and R_5 are independently hydrogen or lower alkyl;

R_6 is hydrogen or lower alkyl; and

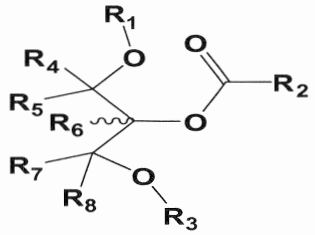
R_7 and R_8 are independently hydrogen or lower alkyl,

including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

33. The use of claim 32, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

34. The use of claim 32, wherein the compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7, 10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z,7Z,10Z,13Z,16Z,19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z,7Z,10Z,13Z,16Z,19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).

35. Use of a compound of formula I:



(I)

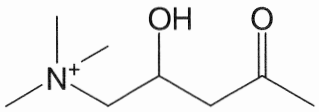
for the manufacture of a medicament for treating or preventing a vascular disease selected from the group consisting of atherosclerosis and hypercholesterolemia, wherein

R_1 and R_2 are the same or different and selected from an alkyl or alkenyl hydrocarbon chain selected from the group consisting of: $CH_3(CH_2)_3$-, $CH_3(CH_2)_5$-,

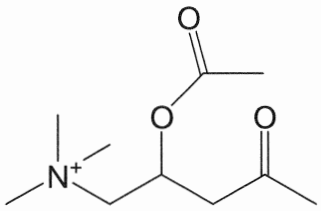
$CH_3(CH_2)_7$-, $CH_3(CH_2)_9$-, $CH_3(CH_2)_{11}$-, $CH_3(CH_2)_{13}$-, $CH_3(CH_2)_{15}$-, $CH_3(CH_2)_{17}$-, $CH_3(CH_2)_{19}$-, $CH_3(CH_2)_{21}$-, $CH_3(CH_2)_{23}$-, $CH_3(CH_2)_3CH{=}CH(CH_2)_7$-, $CH_3(CH_2)_5CH{=}CH(CH_2)_7$-, $CH_3(CH_2)_7CH{=}CH(CH_2)_7$-, $CH_3(CH_2)_4CH{=}CHCH_2CH{=}CH(CH_2)_7$-, $CH_3CH_2CH{=}CHCH_2CH{=}CHCH_2CH{=}CH(CH_2)_7$-, $CH_3CH_2(CH{=}CH)$-, $CH_3(CH_2)_3(CH{=}CH)$-, $CH_3(CH_2)_5(CH{=}CH)$-, $CH_3(CH_2)_7(CH{=}CH)$-, $CH_3(CH_2)_9(CH{=}CH)$-, $CH_3(CH_2)_{11}(CH{=}CH)$-, $CH_3(CH_2)_{13}(CH{=}CH)$-, $CH_3(CH_2)_{15}(CH{=}CH)$-, $CH_3(CH_2)_{17}(CH{=}CH)$-, $CH_3(CH_2)_{19}(CH{=}CH)$-, $CH_3(CH_2)_{21}(CH{=}CH)$-, $CH_3(CH_2)_3CH{=}CH(CH_2)_5(CH{=}CH)$-, $CH_3(CH_2)_5CH{=}CH(CH_2)_5(CH{=}CH)$-, $CH_3(CH_2)_7CH{=}CH(CH_2)_5(CH{=}CH)$-, $CH_3(CH_2)_4CH{=}CHCH_2CH{=}CH(CH_2)_5(CH{=}CH)$, $CH_3CH_2CH{=}CHCH_2CH{=}CHCH_2CH{=}CH(CH_2)_5(CH{=}CH)$-, $CH_3(CH_2)_3CH{=}CH(CH_2)_7$-, $CH_3(CH_2)_5CH{=}CH(CH_2)_7$-, $CH_3(CH_2)_7CH{=}CH(CH_2)_7$-, $CH_3(CH_2)_4(CH{=}CHCH_2)_2(CH_2)_6$-, $CH_3CH_2(CH{=}CHCH_2)_3(CH_2)_6$-, $CH_3(CH_2)_4(CH{=}CHCH_2)_4(CH_2)_2$-, $CH_3CH_2(CH{=}CHCH_2)_5(CH_2)_2$-, $CH_3(CH_2)_7CH{=}CH(CH_2)_{11}$, and $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-;

R_3 is selected from the group consisting of fatty acids having a chain of 4 to 28 carbons, carnitine, acetyl-D/L-carnitine, thiocarnitine, acetyl-D/L-thiocarnitine, creatine, norcarnitine, phosphocholine, lipoic acid, dihydrolipoic acid, phosphoethanolamine, phosphoserine, N-acetylcysteine, substituted or unsubstituted amino acid groups and groups of the structures shown below:

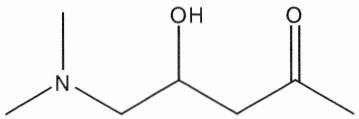
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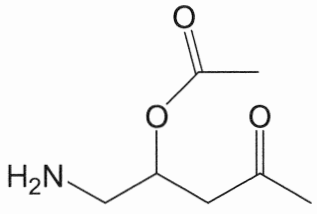
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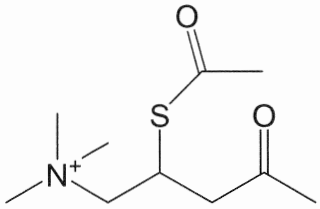


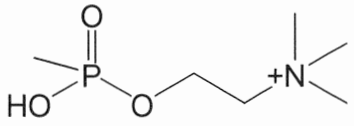
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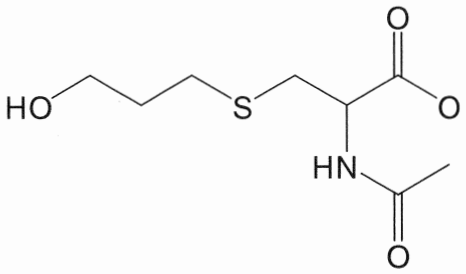
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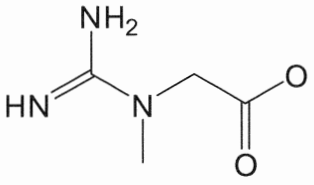




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8



R_4 and R_5 are independently hydrogen or lower alkyl;

R_6 is hydrogen or lower alkyl; and

R_7 and R_8 are independently hydrogen or lower alkyl,

including racemates or isolated stereoisomers and pharmaceutically acceptable salts or esters thereof.

36. The use of claim 35, wherein R_2 is $CH_3CH_2(CH{=}CHCH_2)_6CH_2$-.

37. The use of claim 35, wherein the compound is selected from the group consisting of 2-acetoxy-4-(2-((4Z,7Z,10Z,13Z,16Z,19Z)-docosa-4, 7, 10, 13, 16, 19-hexaenoyloxy)-3-(hexadecyloxy)propoxy)-N,N,N-trimethyl-4-oxobutan-1-aminium (PPI-1009), (4Z,7Z,10Z,13Z,16Z,19Z)-1-(5-((*R*)-1,2-dithiolan-3-yl)pentanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1011) and (4Z,7Z,10Z,13Z,16Z,19Z)-1-(2-acetamido-3-mercaptopropanoyloxy)-3-(hexadecyloxy)propan-2-yl docosa-4, 7, 10, 13, 16, 19-hexaenoate (PPI-1014).