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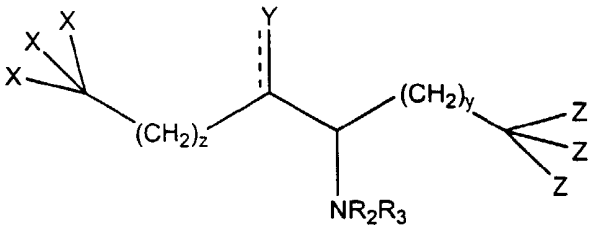
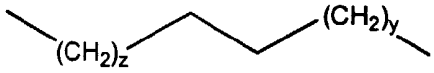
(54) Title: ANTITUMORAL COMPOUNDS



(I)



(II)

(57) Abstract: New spisulosine derivatives of use in treating tumors are of the formula (I) wherein: each X is the same or different, and represents H, OH, OR', SH, SR', SOR', SO_2R', NO_2, NH_2, NHR', $N(R')_2$, CN, halogen, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic, or two groups X may together form =O; Y is NR_1, OR_1, PR_1, SR_1, or halogen, wherein the number of substituents R_1 is selected to suit the valency and each R_1 is independently selected of H, OH, C(=O)R', P(=O)R'R'', substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, and wherein the dotted line indicates an optional double bond; each Z is the same different, and represents H, OH, OR', SH, SR', SOR', SO_2R', NO_2, NH_2, NHR', $N(R')_2$, NHC(O)R', CN, halogen, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic, or two groups Z may together form =O; z is 0 to 25; y is to 0 to 20; R_2 is H, C(=O)R', P(=O)R'R'', S(=O)R'R'', $S(=O)_2R'$, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} Alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl; R_3 is H, C(=O)R', P(=O)R'R'', S(=O)R'R'', $S(=O)_2R'$, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl; each of the R', R'' groups is independently selected from the group consisting of H, OH, NO_2, NH_2, SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, $CO_{2(}CH_{(3}$, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_1-C_{18} alkoxy, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl; there may be one or more unsaturations in the hydrocarbon backbone defined by the chain (II) and salts thereof; with the exception of a C_{16}-C_{24} 2-amino-3-hydroxyalkane or a C_{16}-C_{24} 2-amino-3-hydroxyalkene.

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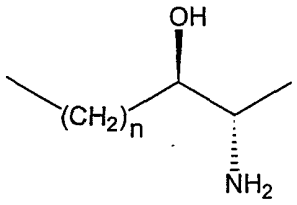
ANTITUMORAL COMPOUNDS

The present invention relates to new antitumoral derivatives of spisulosine-285.

BACKGROUND OF THE INVENTION

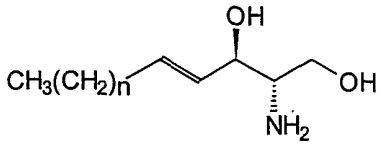
Spisulosine 285 is a bioactive compound that has been found to possess specific antitumor activity, described in the International Patent WO 99/52521. In the same patent specification are also described sphingoid-type bases spisulosines 299 and 313 and some sphingosine analogs.



1 (spisulosine-285) n = 14

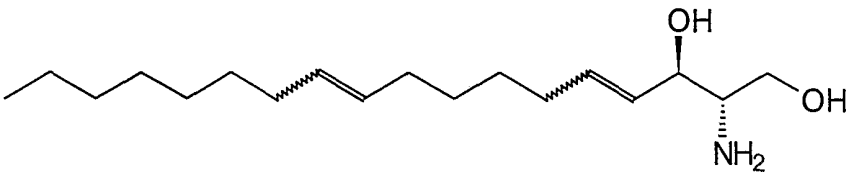
2 (spisulosine-299) n = 15

3 (spisulosine-313) n = 16



sphingosine, n=12 and

nonadeca-4-sphingenine, n=13; and

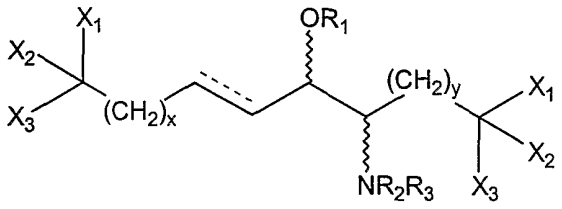


sphinga-4,10-diene.

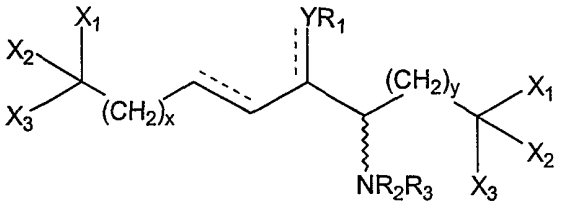
Spisulosines 285, 299 and 313 were isolated from *Spisula polynyma*, an edible clam originally isolated from samples found off the coast of Japan. The comopund we call spisulosine 285 and the *syn* diastereoisomer were first synthetized by Croatian researchers in the determination of absolute configurations of lipid bases with two or more asymmetric carbon atoms (Prostenik, M.; Alaupovic, P. *Croat. Chem. Acta.* 1957, 29, 393).

SUMMARY OF THE INVENTION

The present invention is directed to analogs of the spisulosine family having the following formulae **I** and **II**:



I



II

Wherein the substituent groups defined by R_1, R_2 and R_3 are each independently selected of H, C(=O)R´, P(=O)R´R´´, S(=O)R´R´´, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl. Wherein each of the R´, R´´ groups is independently selected from the group consisting of H, OH, NO_2, NH_2, SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl.

R_2 can be independently an internal salt. Preferred internal salts are formed using any kind of mineral or organic acid such as hydrochloric acid, hydrobromic acid, tartaric acid, succinic acid, etc.

Wherein the substituent groups defined by X_1, X_2 and X_3 are independently selected of H, OH, OR´, SH, SR´, SOR´, SO_2R´, NO_2, NH_2, NHR´, $N(R´)_2$, NHC(O)R´, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic. Wherein substituent groups defined by R´ are each independently selected from the group consisting of H, OH, OR´, SH, SR´, SOR´, SO_2R´, NO_2, NH_2, NHR´, $N(R´)_2$, NHC(O)R´, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic.

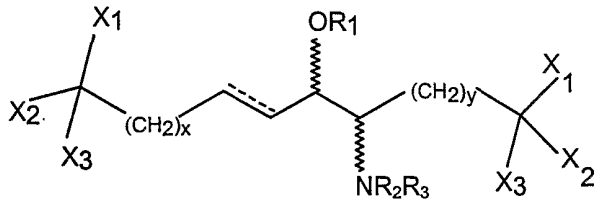
Wherein x and y can be between 0 and 20. Preferably x is in the range 8 to 16, more preferably 10, 11, 12, 13 or 14. Preferably y is 0, 1 or 2. Currently the most preferred is that x is 11, 12 or 13, and y is 0 or 1.

Wherein the dotted line is one or several double bonds placed in any particular position of the side chain.

Wherein the stereochemistry of the groups OR_1 and NR_2R_3 in formula I can be independently *syn* or *anti*.

Wherein the group defined by Y in formula II is independently selected from the group consisting of N, O, P, S, halogen. Wherein the dotted line is a single or double bond. Wherein R_1 is independently selected of H, C(=O)R´, P(=O)R´R´´, S(=O)R´R´´, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl. Wherein each of the R´, R´´ groups is independently selected from the group consisting of H, OH, NO_2, NH_2, SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl.

In one aspect, we provide compounds of the formula **I**:



I

Wherein the substituent groups defined by R_1, R_2 and R_3 are each independently selected of H, C(=O)R´, substituted or unsubstituted C_1-C_{18}

alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl.

R_2 can be independently an internal salt. Preferred internal salts are formed using any kind of mineral or organic acid such as hydrochloric acid, hydrobromic acid, tartaric acid, succinic acid, etc.

Wherein each of the R´ groups is independently selected from the group consisting of H, OH, NO_2, NH_2, SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl.

Wherein X_1, X_2 and X_3 are independently selected of H, OH, OR´, SH, SR´, SOR´, SO_2R´, NO_2, NH_2, NHR´, $N(R´)_2$, NHC(O)R´, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic.

Wherein substituent groups defined by R´ are each independently selected from the group consisting of H, OH, OR´, SH, SR´, SOR´, SO_2R´, NO_2, NH_2, NHR´, $N(R´)_2$, NHC(O)R´, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic.

Wherein x and y can be between 0 and 20.

Wherein the dotted line is one or several double bonds placed in any particular position of the side chain.

Wherein the stereochemistry of the groups OR_1 and NR_2R_3 can be independently *syn* or *anti*.

Suitable halogen substituents in the compounds of the present invention include F, Cl, Br and I.

Alkyl groups preferably have from 1 to about 12 carbon atoms, more preferably 1 to about 8 carbon atoms, still more preferably 1 to about 6 carbon atoms, and most preferably 1, 2, 3 or 4 carbon atoms. Methyl, ethyl and propyl including isopropyl are particularly preferred alkyl groups in the compounds of the present invention. As used herein, the term alkyl, unless otherwise modified, refers to both cyclic and noncyclic groups, although cyclic groups will comprise at least three carbon ring members.

Preferred alkenyl and alkynyl groups in the compounds of the present invention have one or more unsaturated linkages and from 2 to about 12 carbon atoms, more preferably 2 to about 8 carbon atoms, still more preferably 2 to about 6 carbon atoms, even more preferably 1, 2, 3 or 4 carbon atoms. The terms alkenyl and alkynyl as used herein refer to both cyclic and noncyclic groups, although straight or branched noncyclic groups are generally more preferred.

Preferred alkoxy groups in the compounds of the present invention include groups having one or more oxygen linkages and from 1 to about 12 carbon atoms, more preferably from 1 to about 8 carbon atoms, and still more preferably 1 to about 6 carbon atoms, and most preferably 1, 2, 3 or 4 carbon atoms.

Preferred alkylthio groups in the compounds of the present invention have one or more thioether linkages and from 1 to about 12 carbon atoms, more preferably from 1 to about 8 carbon atoms, and still more preferably 1 to about 6 carbon atoms. Alkylthio groups having 1, 2, 3 or 4 carbon atoms are particularly preferred.

Preferred alkylsulfinyl groups in the compounds of the present invention include those groups having one or more sulfoxide (SO) groups and from 1 to about 12 carbon atoms, more preferably from 1 to about 8 carbon atoms, and still more preferebly 1 to about 6 carbon atoms. Alkylsulfinyl groups having 1, 2 3 or 4 carbon atoms are particularly preferred.

Preferred alkylsulfonyl groups in the compounds of the present invention include those groups having one or more sulfonyl (SO_2) groups and from 1 to about 12 carbon atoms, more preferably from 1 to about 8 carbon atoms, and still more preferably 1 to about 6 carbon atoms. Alkylsulfonyl groups having 1, 2, 3 or 4 carbon atoms are particularly preferred.

Preferred aminoalkyl groups include those groups having one or more primary, secondary and/or tertiary amine groups, and from 1 to about 12 carbon atoms, more preferably 1 to about 8 carbon atoms, still more preferably 1 to about 6 carbon atoms, even more preferably 1, 2, 3 or 4 carbon atoms. Secondary and tertiary amine groups are generally more preferred than primary amine moieties.

Suitable heteroaromatic groups in the compounds of the present invention contain one, two or three heteroatoms selected from N, O or S atoms and include, e.g., coumarinyl including 8-coumarinyl, quinolinyl including 8-quinolinyl, pyridyl, pyrazinyl, pyrimidyl, furyl, pyrrolyl, thienyl, thiazolyl, oxazolyl, imidazolyl, indolyl, benzofuranyl and benzothiazolyl. Suitable

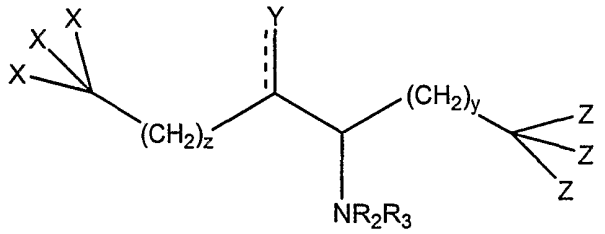
heteroalicyclic groups in the compounds of the present invention contain one, two or three heteroatoms selected from N, O or S atoms and include, e.g., tetrahydrofuranyl, tetrahydropyranyl, piperidinyl, morpholino and pyrrolindinyl groups.

Suitable carbocyclic aryl groups in the compounds of the present invention include single and multiple ring compounds, including multiple ring compounds that contain separate and / or fused aryl groups. Typical carbocyclic aryl groups contain 1 to 3 separate or fused rings and from 6 to about 18 carbon ring atoms. Specifically preferred carbocyclic aryl groups include phenyl including substituted phenyl such as 2-substituted phenyl, 3-substituted phenyl, 2, 3-substituted phenyl, 2,5-substituted phenyl, 2,3,5-substituted and 2,4,5-substituted phenyl, including where one or more of the phenyl substituents is an electron-withdrawing group such as halogen, cyano, nitro, alkanoyl, sulfinyl, sulfonyl and the like; naphthyl including 1-naphthyl and 2-naphthyl; biphenyl; phenanthryl; and anthracyl.

References herein to substituted R' groups in the compounds of the present invention refer to the specified moiety that may be substituted at one or more available positions by one or more suitable groups, e.g., halogen such as fluoro, chloro, bromo and iodo; cyano; hydroxyl; nitro; azido; alkanoyl such as a C1-6 alkanoyl group such as acyl and the like; carboxamido; alkyl groups including those groups having 1 to about 12 carbon atoms or from 1 to about 6 carbon atoms and more preferably 1-3 carbon atoms; alkenyl and alkynyl groups including groups having one or more unsaturated linkages and from 2 to about 12 carbon or from 2 to about 6 carbon atoms; alkoxy groups having those having one or more oxygen linkages and from 1 to about 12 carbon atoms or 1 to about 6 carbon atoms; aryloxy such as phenoxy; alkylthio groups including those moieties having one or more thioether linkages and from 1 to about 12

carbon atoms or from 1 to about 6 carbon atoms; alkylsulfinyl groups including those moieties having one or more sulfinyl linkages and from 1 to about 12 carbon atoms or from 1 to about 6 carbon atoms; alkylsulfonyl groups including those moieties having one or more sulfonyl linkages and from 1 to about 12 carbon atoms or from 1 to about 6 carbon atoms; aminoalkyl groups such as groups having one or more N atoms and from 1 to about 12 carbon atoms or from 1 to about 6 carbon atoms; carbocylic aryl having 6 or more carbons, particularly phenyl (e.g., R being a substituted or unsubstituted biphenyl moiety); and aralkyl such as benzyl. Substituent groups may themselves be substituted, as in a trifluoromethylcinnamoyl group or an aminoacid acyl group such as with valine or Boc-valine.

1. The present invention notably provides compounds of formula:



wherein:

each X is the same or different, and represents H, OH, OR´, SH, SR´, SOR´, $SO_2R´$, NO_2, NH_2, NHR´, $N(R´)_2$, NHC(O)R´, CN, halogen, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic, or two groups X may together form =O;

Y is NR_1, OR_1, PR_1, SR_1, or halogen, wherein the number of substituents R_1 is selected to suit the valency and each R_1 is independently selected of H, OH, C(=O)R´, P(=O)R´R´´, S(=O)R´R´´, substituted or unsubstituted C_1-

C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, and wherein the dotted line indicates an optional double bond such that Y can also be =O or =N-OH or the group Y with NR_2R_3 and the intervening atoms can form a heterocycle;

each Z is the same or different, and represents H, OH, OR´, SH, SR´, SOR´, SO_2R´, NO_2, NH_2, NHR´, $N(R')_2$, NHC(O)R´, CN, halogen, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic, or two groups Z may together form =O;

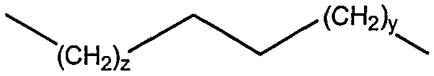
z is 0 to 25;

y is 0 to 20;

R_2 and R_3 are the same or different and each is H, C(=O)R´, C(=S)R', P(=O)R´R´´, S(=O)R´R´´, $S(=O)_2$R´, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl;

each of the R´, R´´ groups is independently selected from the group consisting of H, OH, NO_2, NH_2, NHR', NR'R", SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_1-C_{18} alkoxy, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl;

there may be one or more unsaturations in the hydrocarbon backbone defined by the chain:



and salts thereof.

Typically each X is H.

Typically Y is NR_1, OR_1, PR_1, or halogen, wherein the number of substituents R_1 is selected to suit the valency and each R_1 is independently selected of H, C(=O)R´, P(=O)R´R´´, substituted or unsubstituted C_1-C_{18} alkyl, and wherein the dotted line indicates an optional double bond such that Y can also be =O or =N-OH, or the group Y with NR_2R_3 and the intervening atoms can form a heterocycle.

Typically Z represents H, NH_2, NHR´, N(R´)$_2$, halogen, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic.

Typically z is 10 to 20.

Typically is 0 to 4.

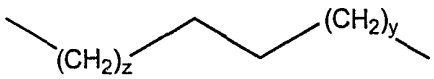
Typically R_2 and R_3 are the same or different and each is H, C(=O)R´, C(=S)R', S(=O)R´R´´, S(=O)$_2$R´, substituted or unsubstituted C_1-C_{18} alkyl;

Each of the R´, R´´ groups is independently selected from the group consisting of H, OH, NO_2, NH_2, NHR', NR'R", SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_1-C_{18} alkoxy, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, the selection of respective classes of defintions

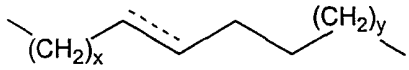
being made as appropriate to suit the preferred defintions given subsequently.

Compounds of this invention extend to salts, notably pharmaceutically acceptable salts. Such salts may be formed with organic or inorganic acids, and examples are given in this text.

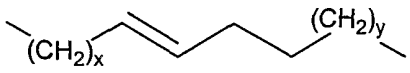
In one class of compounds of this invention, the hydrocarbon backbone defined by the chain:



is of the formula:



where x is 0 to 20 and the dotted line indicates one or more double bonds in the backbone. For example there can a double bond at the position shown by the dotted line. For example, the hydrocarbon backbone is of the formula:



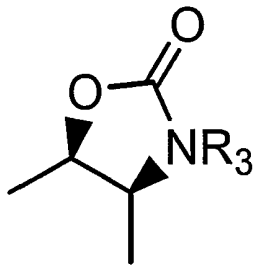
where x and y are as defined.

A preferred group of compounds of this invention include those wherein the terminal group $-C(X)_3$ is $-CH_3$.

In another preferred class, there are no unsaturations in the hydrocarbon backbone.

For preference, z is from 10 to 19.

Suitable compounds include those where Y is OH, O(C=O)R' where R' is optionally halogen-substituted alkyl, OR' where R' is alkyl, halogen, $OP(=O)R'_2$ where R' is alkoxy, NH_2, =O, =NOH, or the group Y when OH with NR_2R_3 and the intervening atoms form a heterocycle of formula:

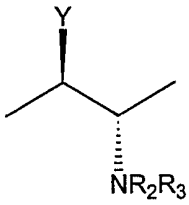


If desired, R_2 and R_3 are the same. Typically at least one of R_2 and R_3 is alkyl; alkyl substituted by aryl; hydrogen; C(=O)R´ where R´ is alkyl or alkoxy, halogen-substituted alkyl, optionally substituted amino-substitued alkyl, aryloxy, alkoxy, optionally substituted aryl-substituted alkenyl; (C=S)NHR' where R' is aryl; (C=O)NHR' where R' is aryl or alkyl; SO_2R' where R' is alkyl, or (C=O)R' where R' is optionally subsituted aminoalkyl thereby giving an optionally subsistituted aminacid acyl group.

In preferred compounds, y is 0 to 3.

The terminal group $-C(Z)_3$ can be $-CH_3$.

The stereochemistry is usually:

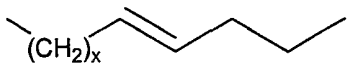


Notable preferred compounds meet two or more of the following criteria:

(a) the terminal group $-C(X)_3$ is $-CH_3$;

(b) z is 10, 11, 12, 13, 14, 15, 16, 17, 18 or 19

(c) the hydrocarbon backbone is of the formula:



where x is 12;

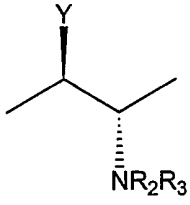
(d) Y is OR_1 where R_1 is H, methyl, acetyl, PO(OMe)2, COCF3 or Y is Cl, $NH_3^+Cl^-$, =O, =NOH;

(e) R_2 and R_3 are independently selected from the group consisting of H, methyl, acetyl, benzyl, Boc, CSNHPh, CONHPh, $CONH^nBu$, SO_2Me, $COCF_3$, COCH=CHPh, $COCH=CHPhCF_3$, $COC_{15}H_{32}$, $COCH(NHBoc)CHMe_2$, $COCH(NH_3^+Cl^-)CHMe_2$;

(f) y is 0, 1, 2 or 3;

(g) Z is the same or different, and represents H, F, methyl, ethyl, hydroxyphenyl, amino, dibenzylamino or NH_3Cl;

(h) the stereochemistry is



or

(i) the compound or salt is in the form of a salt.

At least one of the following criteria can apply:

(j) z is not 12, 13 or 14;

(k) Y is not OH;

(l) at least one of R_2 and R_3 is not hydrogen;

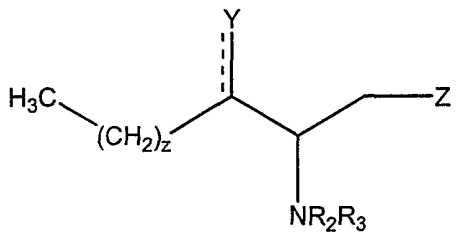
(m) y is at least 1;

(n) at least one Z is not hydrogen;

(o) the compound or salt is in the form of a salt.

Preferred combinations of these criteria include (k) with (l), (k) with (n), (l) with (n), any of these with (i), any of these with (a), any of these with (b). Other preferred combinations which may be taken with or without these combinations include (d) taken with (k), (e) taken with (l), (g) taken with (n).

A preferred class of compounds is of the formula:



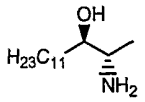
where z is 10 to 19;

Y is OR_1 where R_1 is H, methyl, acetyl, $PO(OMe)_2$, $COCF_3$ or Y is Cl, $NH_3^+Cl^-$, =O, =NOH;

R_2 and R_3 are independently selected from the group consisting of H, methyl, acetyl, benzyl, Boc, CSNHPh, CONHPh, $CONH^nBu$, SO_2Me, $COCF_3$, COCH=CHPh, $COCH=CHPhCF_3$, $COC_{15}H_{32}$, $COCH(NHBoc)CHMe_2$, $COCH(NH_3^+Cl^-)CHMe_2$;

Z represents H, F, methyl, ethyl, hydroxyphenyl, amino, dibenzylamino or NH_3Cl.

Typical compounds of this invention include the following:



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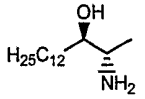

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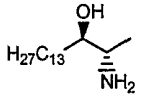

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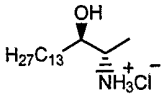

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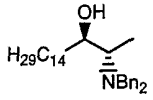

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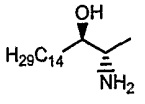

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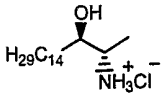

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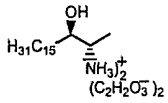

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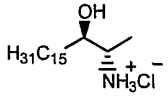

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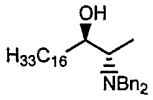

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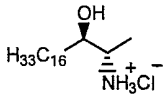

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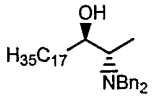

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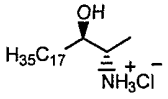

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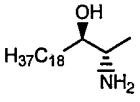

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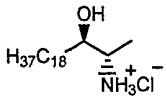

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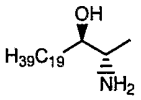

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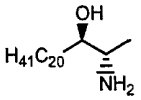

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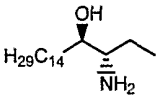

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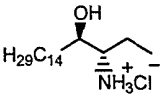

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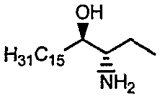

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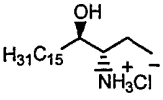

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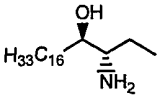

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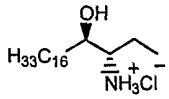

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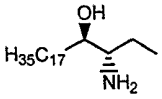

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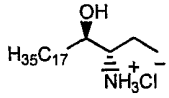

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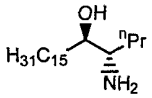

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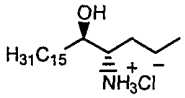

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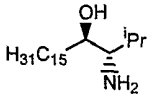

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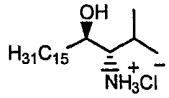

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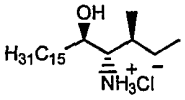

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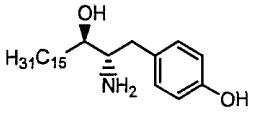

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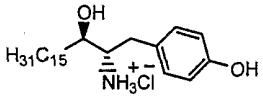

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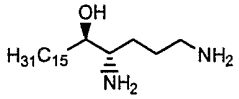

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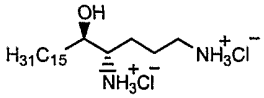

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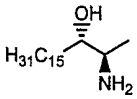

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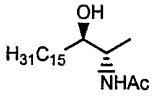

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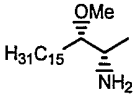

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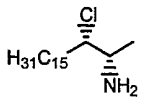

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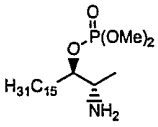

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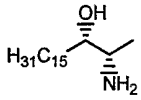

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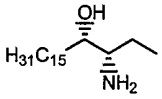

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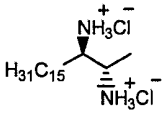

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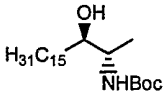

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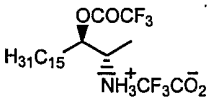

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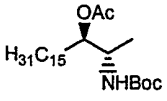

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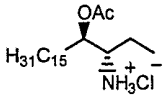

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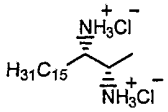

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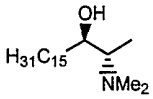

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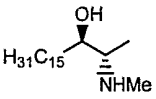

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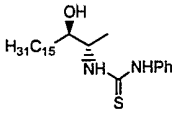

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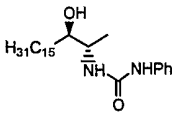

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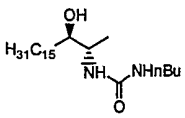

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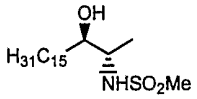

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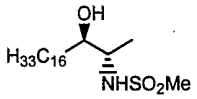

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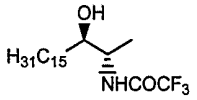

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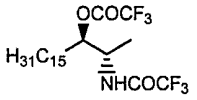

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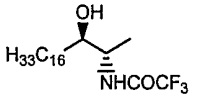

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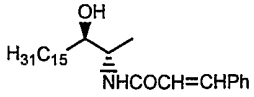

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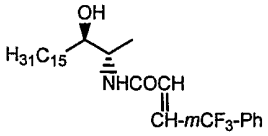

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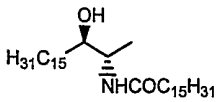

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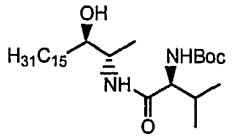

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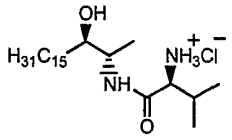

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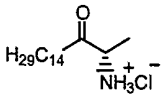

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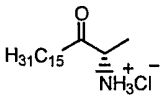

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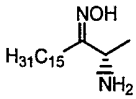

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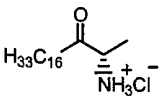

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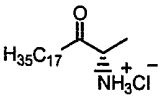

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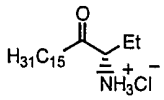

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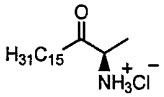

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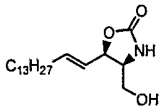

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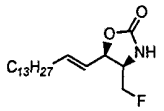

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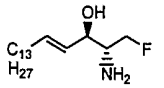

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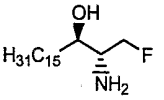


141.

Antitumoral activities of these compounds include leukaemias, lung cancer, colon cancer, kidney cancer, prostate cancer, ovarian cancer, breast cancer, sarcomas and melanomas.

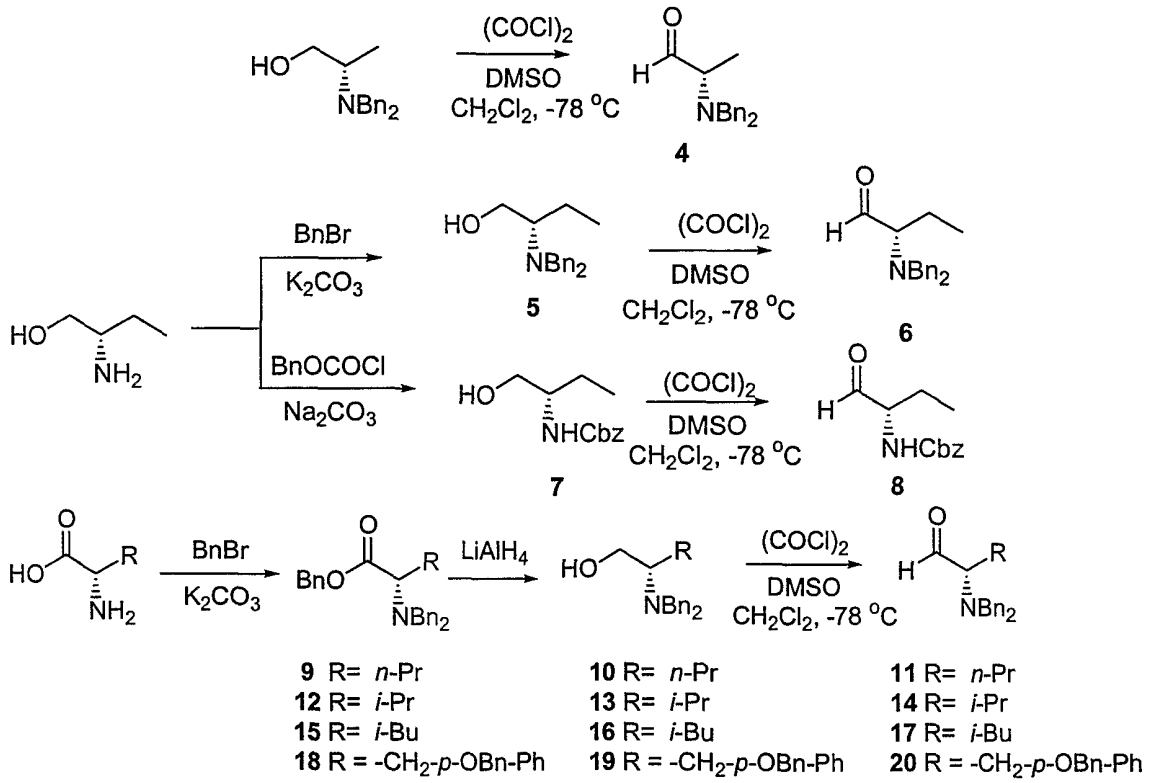
Another especially preferred embodiment of the present invention is pharmaceutical compositions useful as antitumor agents which contain as active ingredient a compound or compounds of the invention, including salts, as well as the processes for their preparation.

Examples of pharmaceutical compositions include any solid (tablets, pills, capsules, granules etc.) or liquid (solutions, suspensions or emulsions) with suitable composition or oral, topical or parenteral administration.

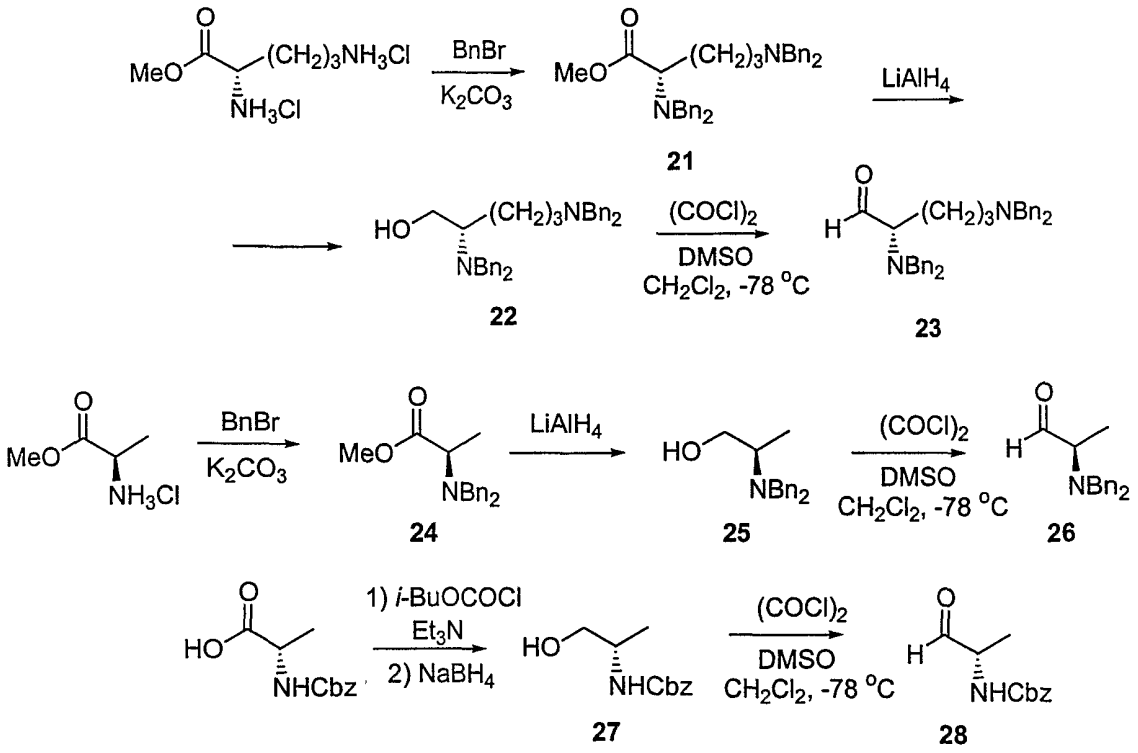
Administration of the compounds or compositions of the present invention may be any suitable method, such as intravenous infusion, oral preparation, intraperitoneal and intravenous preparation.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The compounds of the present invention can be prepared synthetically. The present invention includes the synthetic processes described in the following schemes. Scheme 1 illustrates the preparation of the different aldehydes used as starting materials for the synthesis of spisulosine derivatives.

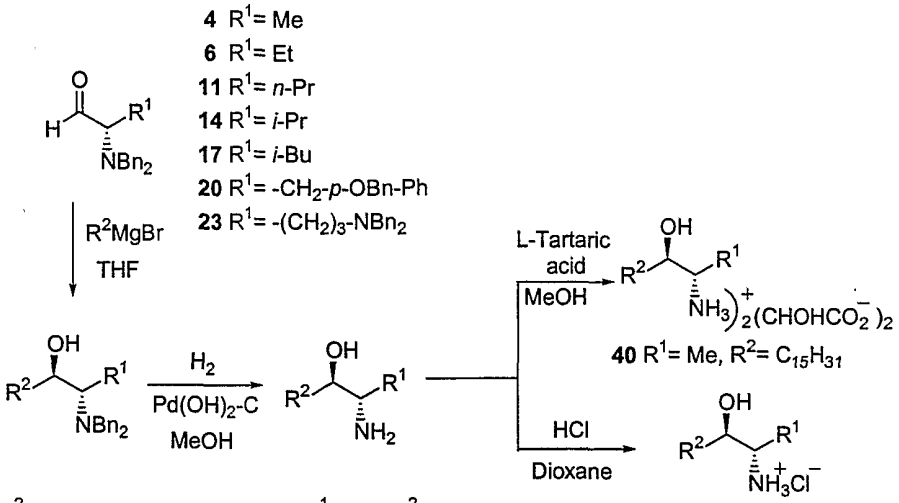


Scheme 1



Scheme 1 (cont.)

Scheme 2 shows the preparation of spisulosine derivatives having the (2*S*,3*R*) configuration using the aldehyde derived from the corresponding L-aminoacid and Grignard reagents of different lengths.



40 R^1= Me, R^2= $C_{15}H_{31}$

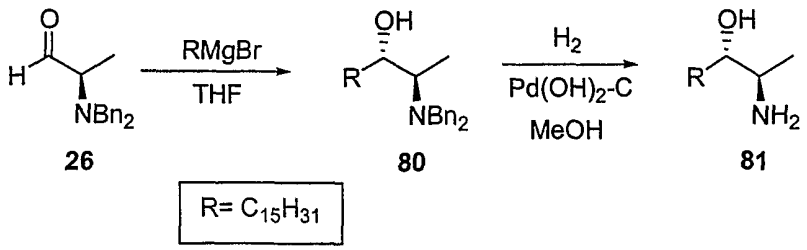
29 R^1= Me, R^2= $C_{11}H_{23}$
31 R^1= Me, R^2= $C_{12}H_{25}$
33 R^1= Me, R^2= $C_{13}H_{27}$
36 R^1= Me, R^2= $C_{14}H_{29}$
39 R^1= Me, R^2= $C_{15}H_{31}$
42 R^1= Me, R^2= $C_{16}H_{33}$
44 R^1= Me, R^2= $C_{17}H_{35}$
46 R^1= Me, R^2= $C_{18}H_{37}$
49 R^1= Me, R^2= $C_{19}H_{39}$
51 R^1= Me, R^2= $C_{20}H_{41}$
53 R^1= Et, R^2= $C_{14}H_{29}$
56 R^1= Et, R^2= $C_{15}H_{31}$
59 R^1= Et, R^2= $C_{16}H_{33}$
62 R^1= Et, R^2= $C_{17}H_{35}$
65 R^1= *n*-Pr, R^2= $C_{15}H_{31}$
68 R^1= *i*-Pr, R^2= $C_{15}H_{31}$
71 R^1= *i*-Bu, R^2= $C_{15}H_{31}$
74 R^1= -(CH)$_2$-*p*-OBn-Ph, R^2= $C_{15}H_{31}$
77 R^1= -$(CH_2)_3$-NBn_2, R^2= $C_{15}H_{31}$

30 R^1= Me, R^2= $C_{11}H_{23}$
32 R^1= Me, R^2= $C_{12}H_{25}$
34 R^1= Me, R^2= $C_{13}H_{27}$
37 R^1= Me, R^2= $C_{14}H_{29}$
1 R^1= Me, R^2= $C_{15}H_{31}$
2 R^1= Me, R^2= $C_{16}H_{33}$
3 R^1= Me, R^2= $C_{17}H_{35}$
47 R^1= Me, R^2= $C_{18}H_{37}$
50 R^1= Me, R^2= $C_{19}H_{39}$
52 R^1= Me, R^2= $C_{20}H_{41}$
54 R^1= Et, R^2= $C_{14}H_{29}$
57 R^1= Et, R^2= $C_{15}H_{31}$
60 R^1= Et, R^2= $C_{16}H_{33}$
63 R^1= Et, R^2= $C_{17}H_{35}$
66 R^1= *n*-Pr, R^2= $C_{15}H_{31}$
69 R^1= *i*-Pr, R^2= $C_{15}H_{31}$
72 R^1= *i*-Bu, R^2= $C_{15}H_{31}$
75 R^1= (CH_2)-*p*-OH-Ph, R^2= $C_{15}H_{31}$
78 R^1= $(CH_2)_3NH_2$, R^2= $C_{15}H_{31}$

35 R^1= Me, R^2= $C_{13}H_{27}$
38 R^1= Me, R^2= $C_{14}H_{29}$
41 R^1= Me, R^2= $C_{15}H_{31}$
43 R^1= Me, R^2= $C_{16}H_{33}$
45 R^1= Me, R^2= $C_{17}H_{35}$
48 R^1= Me, R^2= $C_{18}H_{37}$
55 R^1= Et, R^2= $C_{14}H_{29}$
58 R^1= Et, R^2= $C_{15}H_{31}$
61 R^1= Et, R^2= $C_{16}H_{33}$
64 R^1= Et, R^2= $C_{17}H_{35}$
67 R^1= *n*-Pr, R^2= $C_{15}H_{31}$
70 R^1= *i*-Pr, R^2= $C_{15}H_{31}$
73 R^1= *i*-Bu, R^2= $C_{15}H_{31}$
76 R^1= (CH_2)-*p*-OH-Ph, R^2= $C_{15}H_{31}$
79 R^1= $(CH_2)_3NH_3Cl$, R^2= $C_{15}H_{31}$

Scheme 2

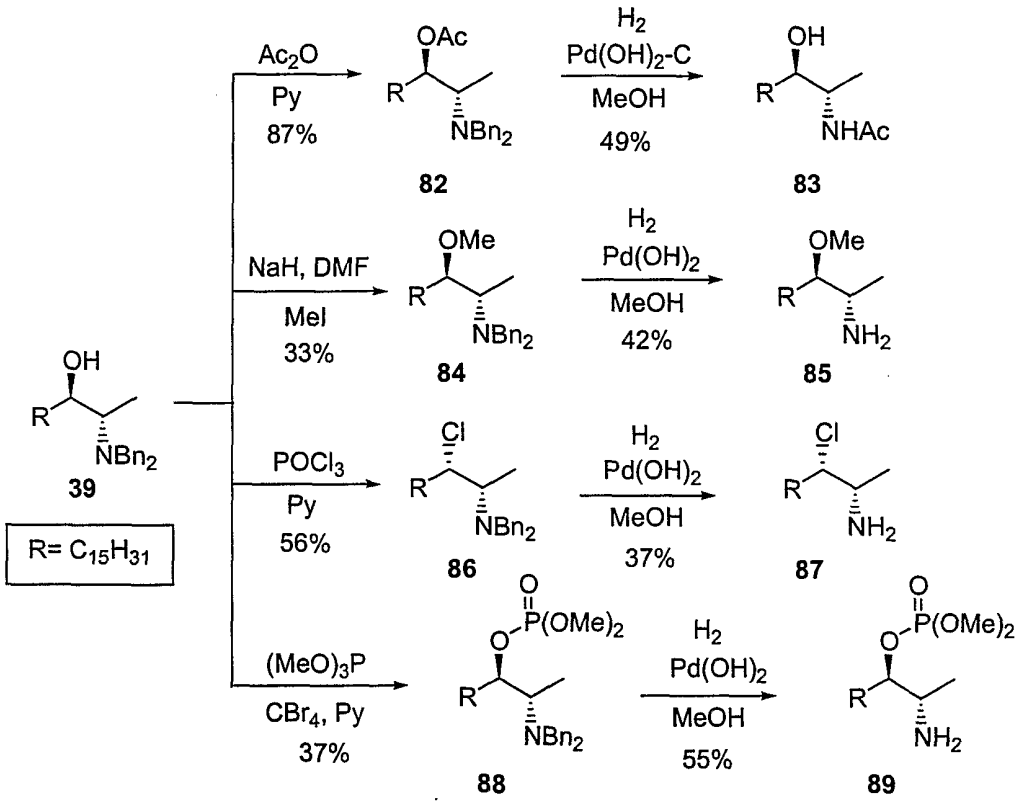
Scheme 3 describes the synthesis of the enantiomeric form of the final products of spisulosine starting from the corresponding D-alanine derivative.



26 80 81

Scheme 3

The methods for the synthesis of *N*-acetyl, *O*-methyl, 3-halo-3-deoxy and *O*-phosphate derivatives of spisulosine are outlined in Scheme 4.

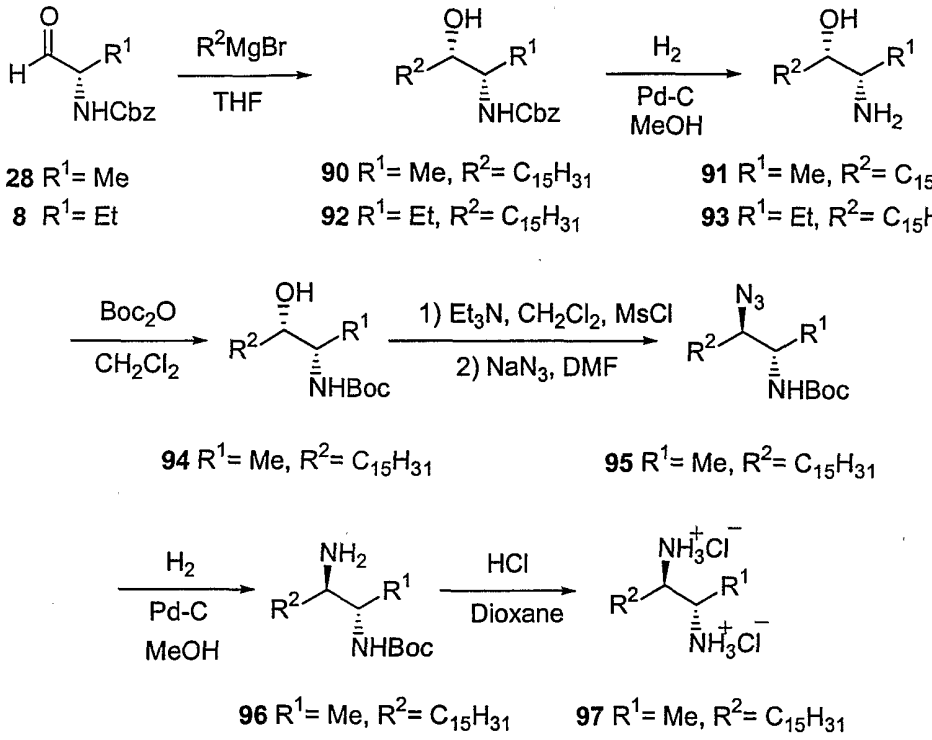


39 82 83 84 85 86 87 88 89

Scheme 4

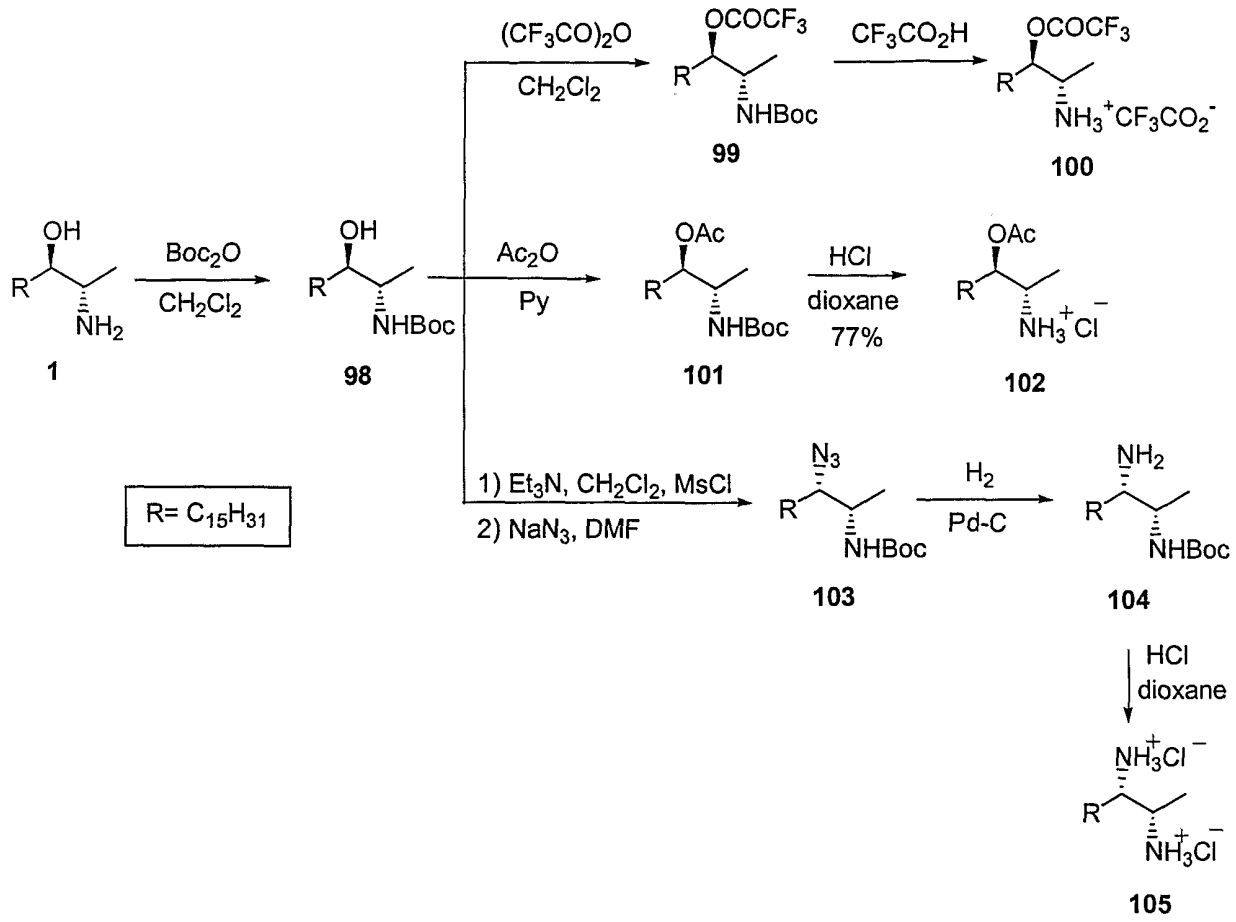
Scheme 5 shows the preparation of the corresponding (2*S*,3*S*) diastereoisomers of spisulosine, in which the final diamine is prepared via

the azide intermediate. Preparation of the diastereoisomeric form of this diamine is outlined in Scheme 6.



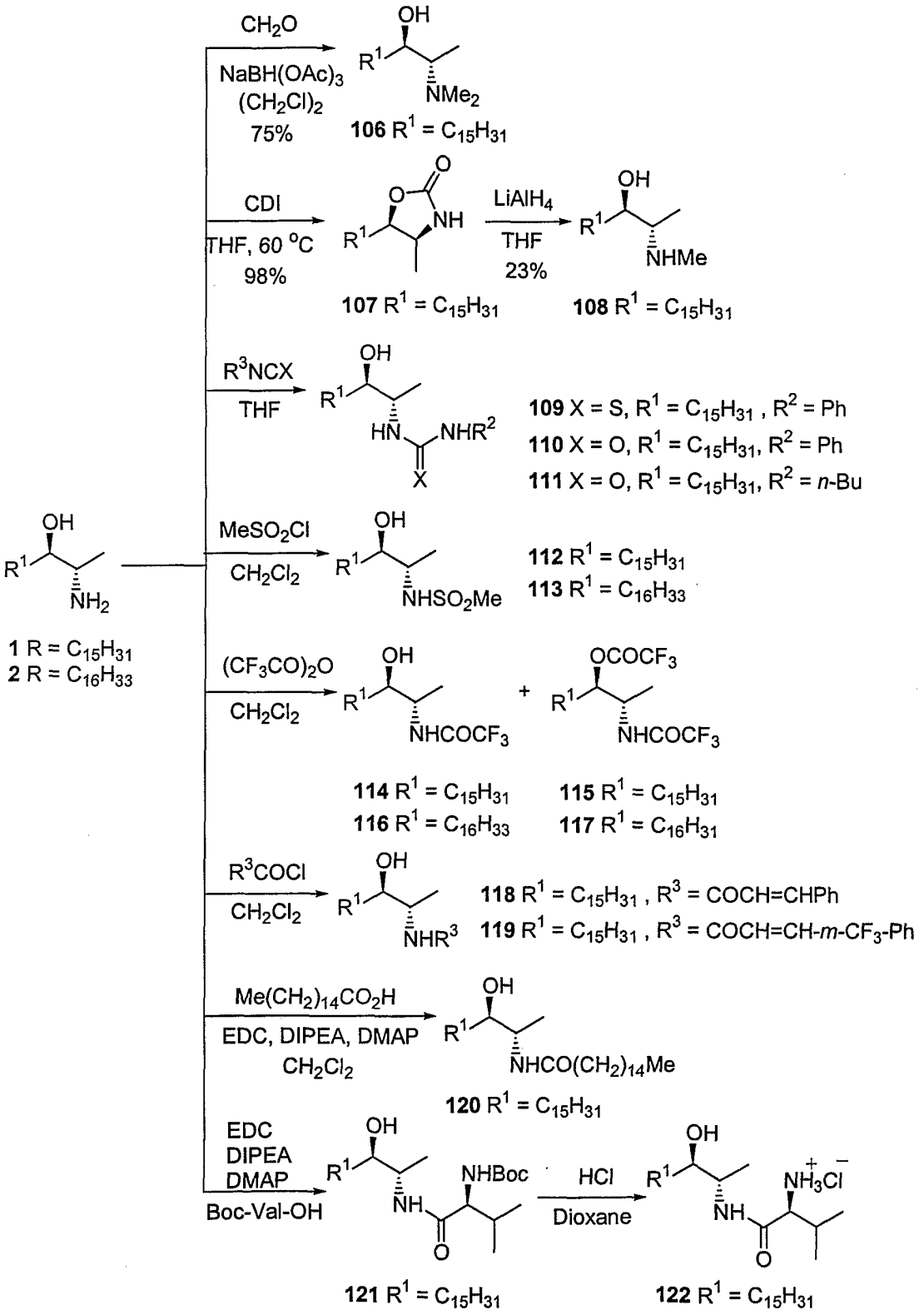
Scheme 5

In addition, the methods for the synthesis of *O*-acetyl and *O*-trifluoroacetyl derivatives of spisulosine are shown in Scheme 6.



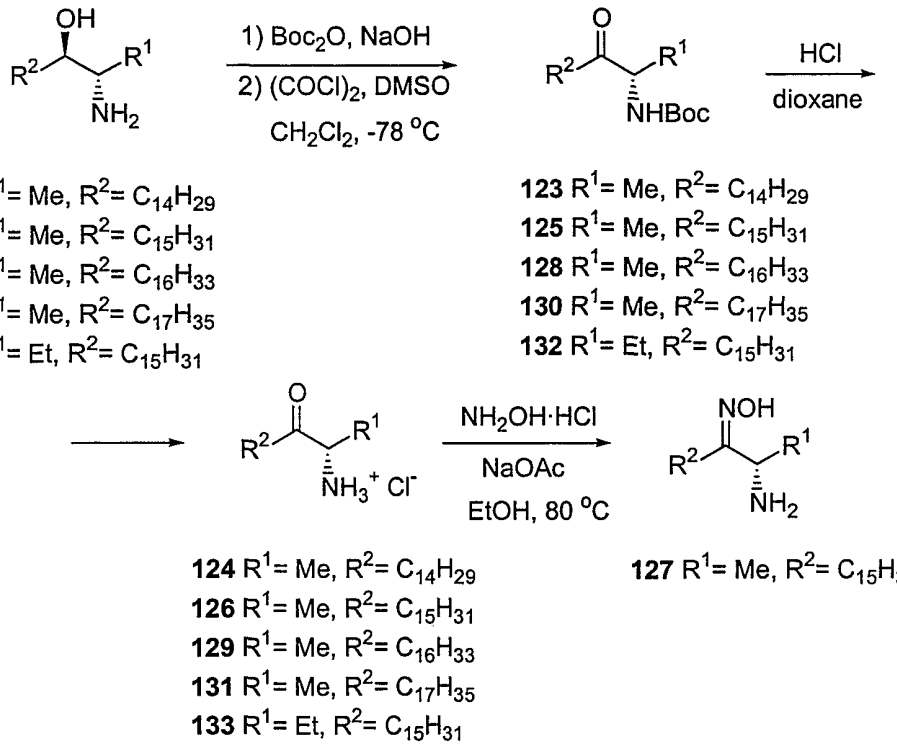
Scheme 6

Other Spisulosines 285 and 299 derivatives are prepared following different procedures which are described in Scheme 7.


CH2O
NaBH(OAc)3
(CH2Cl)2
75%
106 R1 = C15H31
CDI
THF, 60 °C
98%
107 R1 = C15H31
LiAlH4
THF
23%
108 R1 = C15H31
R3NCX
THF
109 X = S, R1 = C15H31 , R2 = Ph
110 X = O, R1 = C15H31, R2 = Ph
111 X = O, R1 = C15H31, R2 = n-Bu
MeSO2Cl
CH2Cl2
112 R1 = C15H31
113 R1 = C16H33
1 R = C15H31
2 R = C16H33
(CF3CO)2O
CH2Cl2
114 R1 = C15H31
115 R1 = C15H31
116 R1 = C16H33
117 R1 = C16H31
R3COCl
CH2Cl2
118 R1 = C15H31 , R3 = COCH=CHPh
119 R1 = C15H31 , R3 = COCH=CH-m-CF3-Ph
Me(CH2)14CO2H
EDC, DIPEA, DMAP
CH2Cl2
120 R1 = C15H31
EDC
DIPEA
DMAP
Boc-Val-OH
HCl
Dioxane
121 R1 = C15H31
122 R1 = C15H31

Scheme 7

3-Keto derivatives of spisulosine and their corresponding oximes can be prepared as described in Scheme 8.



37 R^1= Me, R^2= $C_{14}H_{29}$
1 R^1= Me, R^2= $C_{15}H_{31}$
2 R^1= Me, R^2= $C_{16}H_{33}$
3 R^1= Me, R^2= $C_{17}H_{35}$
57 R^1= Et, R^2= $C_{15}H_{31}$

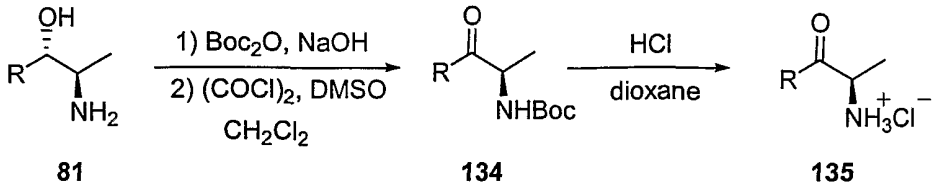
123 R^1= Me, R^2= $C_{14}H_{29}$
125 R^1= Me, R^2= $C_{15}H_{31}$
128 R^1= Me, R^2= $C_{16}H_{33}$
130 R^1= Me, R^2= $C_{17}H_{35}$
132 R^1= Et, R^2= $C_{15}H_{31}$

124 R^1= Me, R^2= $C_{14}H_{29}$
126 R^1= Me, R^2= $C_{15}H_{31}$
129 R^1= Me, R^2= $C_{16}H_{33}$
131 R^1= Me, R^2= $C_{17}H_{35}$
133 R^1= Et, R^2= $C_{15}H_{31}$

127 R^1= Me, R^2= $C_{15}H_{31}$

Scheme 8

The enantiomeric form of ketone **126** is prepared from the appropriate aminoalcohol as indicated in Scheme 9.

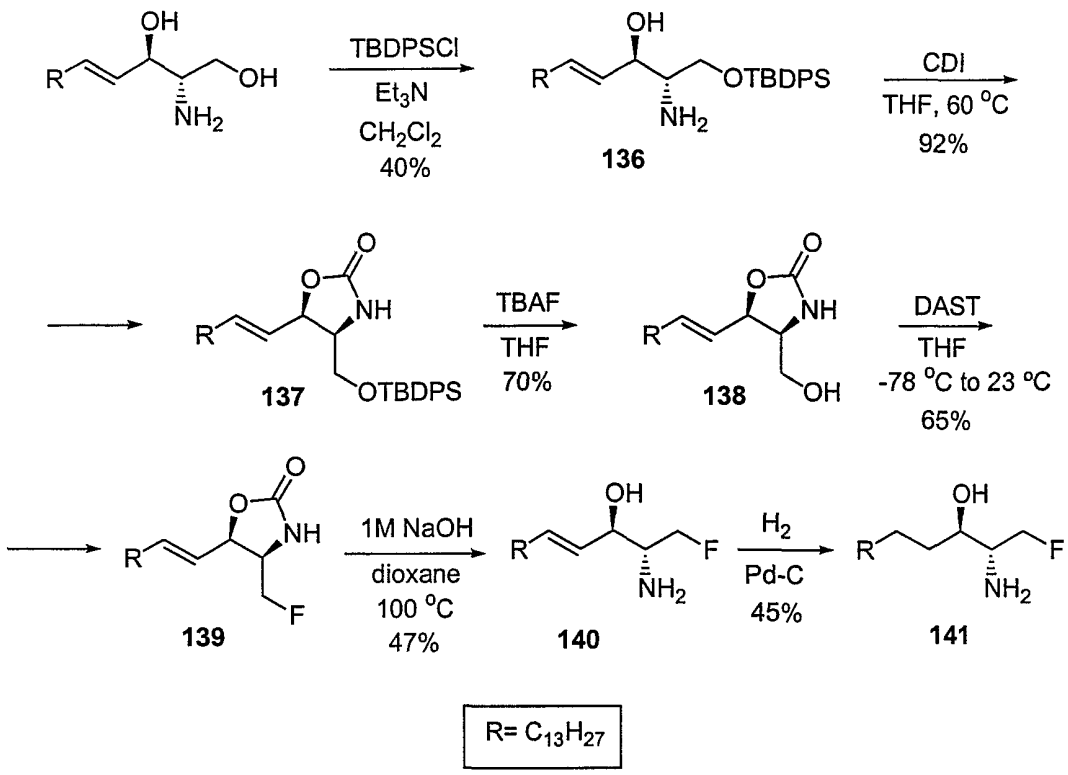


81 **134** **135**

R= $C_{15}H_{31}$

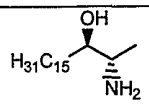
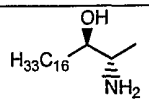
Scheme 9

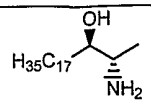
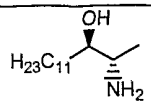
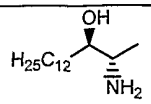
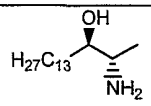
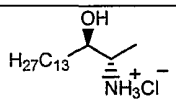
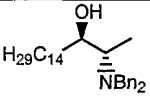
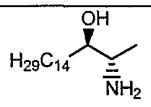
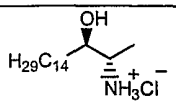
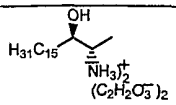
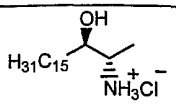
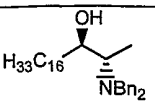
The synthesis of the 1-fluoro derivative of spisulosine starting from D-*erythro*-sphingosine is depicted in Scheme 10.

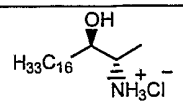
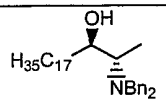
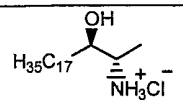
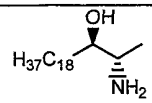
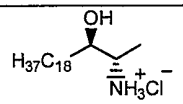
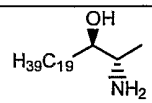
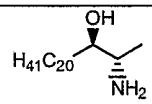
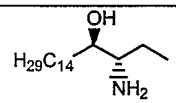
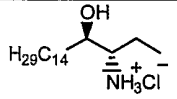
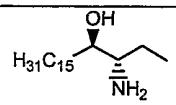
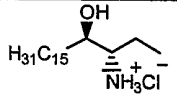


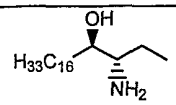
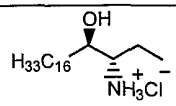
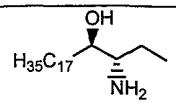
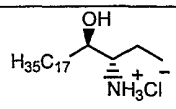
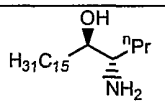
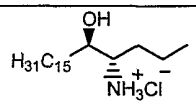
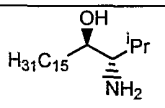
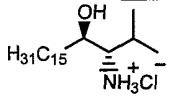
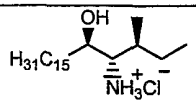
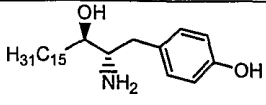
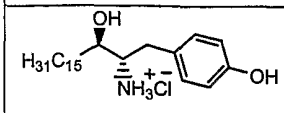
Scheme 10

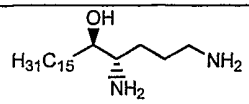
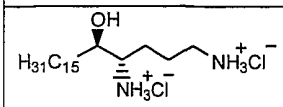
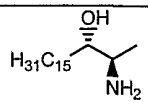
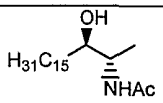
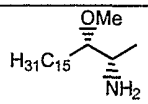
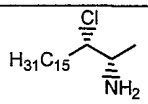
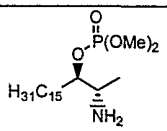
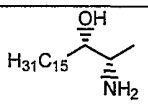
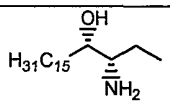
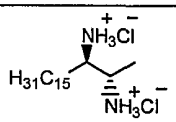
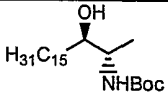
Table 1. Cytotoxicity of Spisulosine Analogs (IC50, Molar)

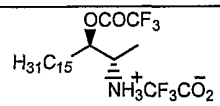
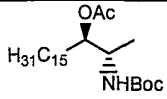
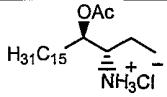
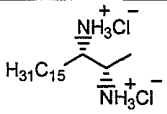
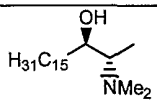
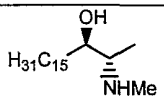
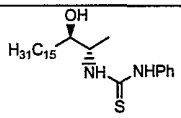
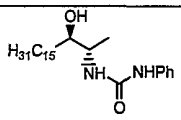
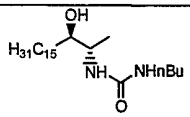
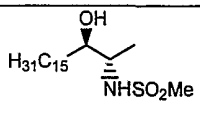
Compound	MW	P388	A549	HT29	MEL28	DU145
 1	285,51	3,50E-08	3,50E-08	3,50E-08	1.75E-07	3,50E-08
 2	299,53	3,34E-08	3,34E-08	3,34E-08	3,34E-08	3,34E-08

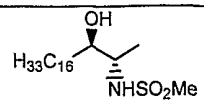
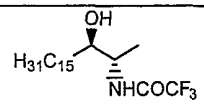
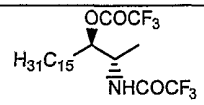
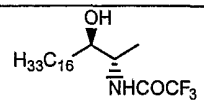
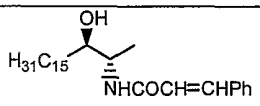
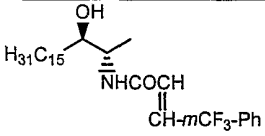
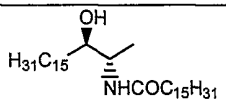
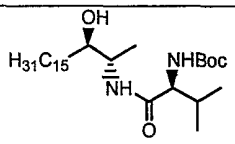
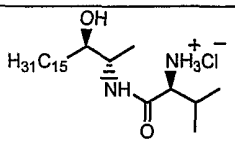
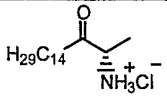
 **3**	313,56	3,19E-08	3,19E-08	3,19E-08	3,19E-07	3,19E-08
 **30**	229,40	4.36E-07	2,18E-06	4,36E-07	2,18E-06	2,18E-06
 **32**	243,43	4,11E-07	4,11E-07	4,11E-07	2,05E-06	4,11E-07
 **34**	257,46	3,88E-07	1,94E-07	3,88E-07	3,88E-07	1,94E-07
 **35**	293.92		3.40E-09	3.40E-09		
 **36**	451,73	NA	NA	NA	NA	NA
 **37**	271,48	3,68E-08	3,68E-08	3,68E-08	3,68E-08	3,68E-08
 **38**	307.94		3.25E-08	3.25E-08		
 **40**	360,55	2,77E-08	2,77E-08	2,77E-08	2,77E-08	2,77E-08
 **41**	321,97	3,11E-08	3,11E-08	1,55E-08	3,11E-07	3,11E-08
 **42**	479.78	NA	NA	NA	NA	NA

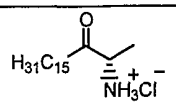
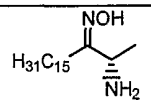
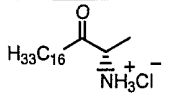
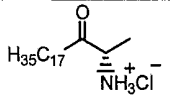
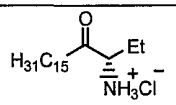
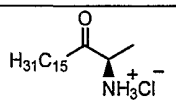
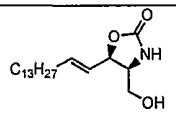
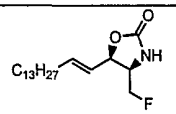
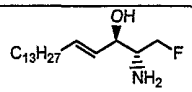
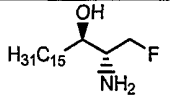
 **43**	336.00		2.98E-08	2.98E-08		
 **44**	493,81	NA	NA	NA	NA	NA
 **45**	350.02		1.43E-08	1.43E-08		
 **47**	327,59	1,53E-07	3,05E-07	3,05E-07	3,05E-07	3,05E-07
 **48**	364.05		2.75E-08	2.75E-08		
 **50**	341,61	2,93E-07	NA	1,46E-06	NA	1,46E-06
 **52**	355,64	1,41E-06	NA	2,81E-06	NA	2,81E-06
 **54**	285.51		3.50E-09	3.50E-09		
 **55**	321.97		1.55E-08	1.55E-08		
 **57**	299,53	3,34E-08	3,34E-08	3,34E-08	3,34E-07	3,34E-08
 **58**	336.00		2.98E-09	2.98E-09		

 **60**	313.56		3.19E-07	3.19E-07		
 **61**	350.02		2.86E-08	2.86E-08		
 **63**	327.59		3.05E-08	3.05E-08		
 **64**	364.05		2.75E-08	2.75E-08		
 **66**	313,56		1,59E-07	1,59E-07		
 **67**	350.02		2.86E-08	2.86E-08		
 **69**	313.56		NA	NA		
 **70**	350.02		NA	NA		
 **73**	364.05		NA	NA		
 **75**	377.60		1.32E-06	1.32E-06		
 **76**	414.06		2.42E-07	2.42E-07		

 **78**	328.58		1.52E-06	1.52E-06		
 **79**	401.50		1.24E-06	1.24E-06		
 **81**	285,51	3,50E-07	3,50E-07	3,50E-07	3,50E-07	3,50E-07
 **83**	327,55	NA	NA	NA	NA	NA
 **85**	299.53		1.67E-06	1.67E-06		
 **87**	303,95	3,29E-07	3,29E-07	3,29E-07	3,29E-07	3,29E-07
 **89**	393,54	1,27E-06	1,27E-06	1,27E-06	1,27E-06	1,27E-06
 **91**	285,51	3,50E-07	3,50E-07	3,50E-07	3,50E-07	3,50E-07
 **93**	299,53	3,34E-07	3,34E-07	3,34E-07	3,34E-07	3,34E-07
 **97**	357.44		1.40E-06	1.40E-06		
						

98	385.62		NA	NA		
 **100**	495.54		2.02E-08	2.02E-08		
 **101**	427,66	NA	NA	NA	NA	NA
 **102**	364,01	2,75E-07	2,75E-07	1,37E-07	2,75E-07	1,37E-07
 **105**	357.44		2.80E-07	2.80E-07		
 **106**	313,56	3,19E-07	3,19E-07	3,19E-07	3,19E-07	3,19E-07
 **108**	299,53	3,34E-07	3,34E-07	3,34E-07	3,34E-07	3,34E-07
 **109**	420,70	NA	NA	NA	NA	NA
 **110**	404.63		NA	NA		
 **111**	384.64		NA	NA		
 **112**	363.60		2.75E-08	2.75E-08		

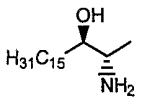
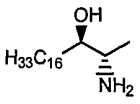
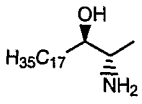
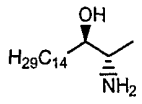
 **113**	377.63		2.65E-07	2.65E-07		
 **114**	395.54		NA	NA		
 **115**	477.52		NA	NA		
 **116**	395.54		NA	NA		
 **118**	415.65		NA	NA		
 **119**	483.65		NA	NA		
 **120**	539.96		NA	NA		
 **121**	484.76		NA	NA		
 **122**	421.10		NA	NA		
 **124**	305,93	1,63E-07	1,63E-07	1,63E-07	3,27E-07	1,63E-07

 **126**	319,95	3,13E-08	1,56E-07	3,13E-08	1,56E-07	3,13E-08
 **127**	298,51	3,35E-07	3,35E-07	3,35E-07	3,35E-07	3,35E-07
 **129**	333,98	1,50E-07	1,50E-07	1,50E-07	2,99E-07	1,50E-07
 **131**	348,01	1,44E-07	1,44E-07	1,44E-07	2,87E-07	1,44E-07
 **133**	333,98	2,99E-08	2,99E-08	2,99E-08	2,99E-07	2,99E-08
 **135**	319,95	1,56E-07	1,56E-07	1,56E-07	3,13E-07	1,56E-07
 **138**	325,49	NA	NA	NA	NA	NA
 **139**	327,48	NA	NA	NA	NA	NA
 **140**	301,48		3,32E-08	3,32E-08		
 **141**	303,50	3,29E-08	3,29E-08	3,29E-08	3,29E-07	3,29E-07

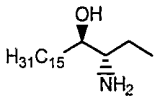
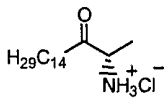
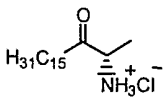
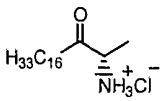
Methodology: after Berjeron et al, Biochem and Bioph Res. Comm., **1984**, 121, 3, 848-854

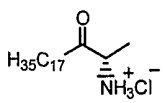
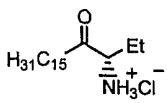
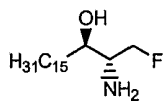
NA= not active

Table 2. Cytotoxicity of Spisulosine Analogs (IC50, Molar)

Solid Tumors	**Line**	 **1**	 **2**	 **3**	 **37**
Bladder	5637		4.72E-08	6.34E-06	3.65E-08
Breast	MX-1	1.95E-06			
Colon	HT-29	1.28E-07	6.43E-08	9.07E-06	2.64E-07
Gastric	Hs746t	3.95E-07			
Liver	SK-HEP-1	2.97E-07			
NSCL	A549	8.57E-08	3.43E-08	9.79E-06	1.01E-05
Ovary	SK-OV-3	7.02E-07			
Pancreas	PANC-1		1.67E-07	7.22E-07	8.64E-08
Pharynx	FADU	2.49E-07	1.03E-08	8.12E-08	7.84E-08
Prostate	PC-3		8.60E-08	4.9E-08	3.79E-07
Prostate	DU-145		7.39E-08	9.86E-06	2.01E-07
Prostate	LNCAP		4.44E-08	7.69E-06	7.15E-08
Renal	786-O	1.38E-07			
SCL	NCI-H187		1.63E-07	7.17E-06	NA
Retinoblastoma	Y-79		4.65E-06	NA	NA
Melanoma	Mel-28		7.21E-06	NA	1.03E-05
Fibrosarcoma	SW 694	NA	6.49E-06	1.04E-05	1.01E-05
Chondrosarcoma	CHSA		1.80E-08	1.58E-06	9.65E-06
Osteosarcoma	OSA-FH		1.83E-07	8.60E-06	NA

Methodology: MTS. 4-Parameter Curve Fit w/SoftMax. Values are Molar
NA = not active

Solid Tumors	Line	 57	 124	 126	 129
Bladder	5637	7.80E-06	3.26E-06	NA	2.99E-05
Breast	MX-1		NA	2.84E-06	1.49E-05
Colon	HT-29	9.11E-06	NA		NA
Gastric	Hs746t			NA	
Liver	SK-HEP-1			NA	
NSCL	A549	1.03E-05	4.90E-05	NA	NA
Ovary	SK-OV-3			NA	
Pancreas	PANC-1	1.86E-07	NA	NA	NA
Pharynx	FADU	2.25E-07	1.96E-05	NA	NA
Prostate	PC-3	1.02E-05			
Prostate	DU-145	7.55E-08		NA	
Prostate	LNCAP	6.35E-06		NA	
Renal	786-O		NA	1.62E-07	NA
SCL	NCI-H187	7.29E-06		3.55E-06	
Retinoblastoma	Y-79	9.51E-06		1.21E-05	
Melanoma	Mel-28	9.4E-06	NA	NA	NA
Fibrosarcoma	SW 694	7.57E-06			
Chondrosarcoma	CHSA	8.94E-06	NA	NA	NA
Osteosarcoma	OSA-FH	8.52E-06	NA	NA	1.49E-05

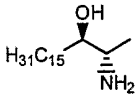
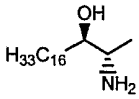
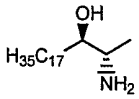
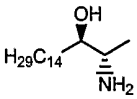
Solid Tumors	Line	 131	 133	 141
Bladder	5637	NA	1.58E-06	1.45E-06
Breast	MX-1	NA	1.72E-06	4.29E-06
Colon	HT-29	NA	NA	
Gastric	Hs746t			1.62E-05

Liver	SK-HEP-1			1.55E-05
NSCL	A549	2.01E-05	NA	
Ovary	SK-OV-3			NA
Pancreas	PANC-1	NA	NA	
Pharynx	FADU	1.43E-05	2.99E-06	3.96E-06
Prostate	PC-3			2.18E-05
Prostate	DU-145			4.95E-08
Prostate	LNCAP			NA
Renal	786-O	NA	5.98E-05	3.30E-06
SCL	NCI-H187			
Retinoblastoma	Y-79			1.65E-06
Melanoma	Mel-28	NA	NA	2.54E-06
Fibrosarcoma	SW 694			
Chondrosarcoma	CHSA	NA	NA	4.62E-06
Osteosarcoma	OSA-FH	NA	NA	

Methodology: MTS. 4-Parameter Curve Fit w/SoftMax. Values are Molar

NA= not active

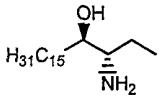
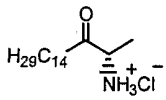
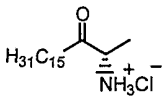
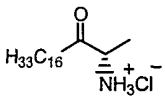
Table 3. Cytotoxicity of Spisulosine Analogs (IC50, Molar)

Leukemias/ Lymphomas	**Line**	 **1**	 **2**	 **3**	 **37**
ALL (Promyelocytic leukemia)	HL-60	4.25E-07			
ALL (Acute lymphobalstic)	Molt 3		1.12E-06	7.61E-06	9.83E-09
CML (Chronic myelogenous)	K562	7.84E-07			
ALL (B-cell)	CCRF-SB	NA			
Leukemia (Hairy B-cell)	Mo-B				
Leukemia (Plasma cell)	ARH-77	6.82E-07			
Lymphoma (T cell)	H9	1.55E-06			
Lymphoma (Cutaneous	Hut 78	2.16E-06	1.06E-05	NA	8.81E-06

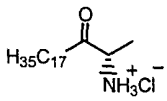
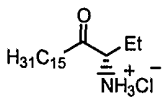
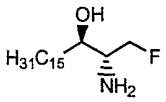
T cell)					
Lymphoma (undifferentiated)	MC116		8.82E-06	1.09E-05	9.58E-06
Lymphoma (Burkitts B cell)	RAMOS	2.14E-06			
Lymphoma (Histiocytic)	U-937	9.81E-07	2.98E-08	NA	
Lymphoma (B cell)	CCRF-SB				
Lymphoma (B cell)	MoB				
Lymphoma (Burkitts ascites)	P3HR1	3.37E-06			

Methodology: MTS. 4-Parameter Curve Fit w/SoftMax. Values are Molar

NA= not active

Leukemias/ Lymphomas	**Line**	 **57**	 **124**	 **126**	 **129**
ALL (Promyelocytic leukemia)	HL-60				
ALL (Acute lymphobalstic)	Molt 3	3.76E-08	2.61E-05		NA
CML (Chronic myelogenous)	K562			0.001	
ALL (B-cell)	CCRF-SB				
Leukemia (Hairy B-cell)	Mo-B				
Leukemia (Plasma cell)	ARH-77				
Lymphoma (T cell)	H9		NA	NA	NA
Lymphoma (Cutaneous T cell)	Hut 78	9.15E-06			
Lymphoma (undifferentiated)	MC116	NA	NA		NA

Lymphoma (Burkitts B cell)	RAMOS		NA		NA
Lymphoma (Histiocytic)	U-937		NA		NA
Lymphoma (B cell)	CCRF-SB				
Lymphoma (B cell)	MoB				
Lymphoma (Burkitts ascites)	P3HR1				

Leukemias/ Lymphomas	**Line**	 **131**	 **133**	 **141**
ALL (Promyelocytic leukemia)	HL-60			1.29E-06
ALL (Acute lymphobalstic)	Molt 3	1.43E-05	5.81E-07	
CML (Chronic myelogenous)	K562			
ALL (B-cell)	CCRF-SB			
Leukemia (Hairy B-cell)	Mo-B			
Leukemia (Plasma cell)	ARH-77			
Lymphoma (T cell)	H9	2.59E-06	5.98E-06	
Lymphoma (Cutaneous T cell)	Hut 78			
Lymphoma (undifferentiated)	MC116	NA	NA	
Lymphoma (Burkitts B cell)	RAMOS	1.65E-06	1.21E-06	
Lymphoma (Histiocytic)	U-937	NA	NA	
Lymphoma (B cell)	CCRF-SB			
Lymphoma (B cell)	MoB			
Lymphoma (Burkitts ascites)	P3HR1			

Methodology: MTS. 4-Parameter Curve Fit w/SoftMax. Values are Molar

NA = not active

EXPERIMENTAL SECTION

General Procedures

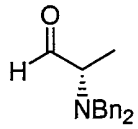
All solvents were reagent grade (used in work-ups) or HPLC grade (used as reaction and/or as purification solvent). Anhydrous solvents were used directly as supplied by the manufacturer. All other reagents were commercial compounds of the highest purity available. All amino acids and their derivatives used as starting materials were commercially available. Compounds **1** and **39** were described in the International Patent WO 99/52521. Analytical thin-layer chromatography (TLC) was performed on Merck silica gel aluminium sheets (60, F254) precoated with a fluorescent indicator. Visualization was effected using ultraviolet light (254 nm), phosphomolybdic acid (7% w/v) in 95% ethanol. Proton and carbon magnetic resonance spectra (^{1}H, ^{13}C-NMR) were recorded on a Varian-300 (300 MHz) Fourier transform spectrometer, and chemical shifts were expressed in parts per million (ppm) relative to $CHCl_3$ as an internal reference (7.26 ppm for ^{1}H and 77.0 for ^{13}C). Multiplicities are designated as singlet (s), doublet (d), doublet of doublets (dd), doublet of triplets (dt), triplet (t), quartet (q), quintet (quint), multiplet (m), and broad singlet (br s). Electrospray ionization mass spectra (ESI-MS) were obtained on a Hewlett Packard Series 1100 MSD. Flash column chromatography was carried out on E. Merck silica gel 60 (240-400 mesh) using the solvent systems listed under individual experiments.

Examples of the Invention

Illustrative examples of the synthesis of spisulosine derivatives according to the present invention are as follows:

Example 1:

(*S*)-2-(*N*,*N*-Dibenzylamino)-propionaldehyde, 4.



To a cold (-78 °C) solution of $(COCl)_2$ (2M in CH_2Cl_2, 2.47 mL, 4.94 mmol) in CH_2Cl_2 (8 mL), DMSO (0.70 mL, 9.89 mmol) was added dropwise. After stirring at -78 °C for 15 min, a solution of (*S*)-2-(*N*,*N*-dibenzylamino)-1-propanol (1.01 g, 3.96 mmol) in CH_2Cl_2 (10 mL) was added dropwise. The mixture was stirred at -78 °C for 1 h, and then Et_3N (2.76 mL, 19.78 mmol) was added. The reaction was warmed up to 0 °C and stirred for 15 min, followed by the addition of NH_4Cl (25 mL, sat. aq.). The crude was extracted with CH_2Cl_2 (3x25 mL), washed successively with $NaHCO_3$ (50 mL, sat. aq.) and brine (50 mL), dried over Na_2SO_4 and concentrated *in vacuo*. Aldehyde **4** was obtained as a yellow oil and used without further purification (928 mg, 93% yield).

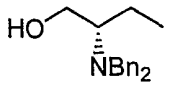
R_f 0.57 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 1.18 (d, 3H, *J*= 6.7 Hz), 3.33 (q, 1H, *J*= 6.7 Hz), 3.57 (d, 2H, *J*= 13.8 Hz), 3.74 (d, 2H, *J*= 13.6 Hz), 7.23-7.42 (m, 10H), 9.73 (s, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 6.8, 54.9, 62.8, 127.3, 128.4, 128.8, 139.0, 204.5.

Example 2:

(*S*)-2-(*N*,*N*-Dibenzylamino)-1-butanol, 5.



To a solution of (*S*)-2-amino-1-butanol (1.0 mL, 10.58 mmol) in MeOH (20 mL), BnBr (5.0 mL, 42.32 mmol) and K_2CO_3 (5.85 g, 42.32 mmol) were added. The mixture was stirred at 60 °C for 5 h, and then cooled down to room temperature and filtered, washing the solid with EtOAc. The filtrates were concentrated *in vacuo* and the residue purified by column chromatography on silica (100% hexane to hexane/EtOAc 5:1) to obtain alcohol **5** as a white solid (2.7 g, 95% yield).

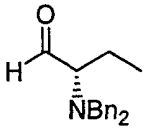
R_f 0.26 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.98 (t, 3H, *J*= 7.5 Hz), 1.25-1.37 (m, 1H), 1.79-1.89 (m, 1H), 2.74-2.83 (m, 1H), 3.31 (br s, 1H), 3.45-3.52 (m, 1H), 3.50 (d, 2H, *J*= 13.1 Hz), 3.55-3.65 (m, 1H), 3.88 (d, 2H, *J*= 13.3 Hz), 7.26-7.41 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 11.6, 17.8, 53.0, 60.4, 127.0, 128.3, 128.8, 139.3.

Example 3:

(*S*)-2-(*N*,*N*-Dibenzylamino)-butyraldehyde, 6.



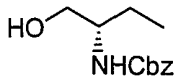
According to the method of Example 1, from alcohol **5** (1.0 g, 3.7 mmol), aldehyde **6** was obtained as a yellow oil and used without further purification (1.0 g, 100% yield).

R_f 0.73 (hexane/Et_2O 1:1);

^1H NMR (300 MHz, $CDCl_3$) δ 0.97 (t, 3H, *J*= 7.5 Hz), 1.64-1.85 (m, 2H), 3.08 (t, 1H, *J*= 6.8 Hz), 3.72 (d, 2H, *J*= 13.6 Hz), 3.80 (d, 2H, *J*= 13.8 Hz), 7.22-7.39 (m, 10H), 9.73 (s, 1H).

Example 4:

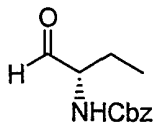
(*S*)-2-(*N*-Benzyloxycarbonylamino)-1-butanol, 7.



To a cold (0 °C) solution of (*S*)-2-amino-1-butanol (2.0 g, 22.5 mmol) in acetone/H_2O 1:1 (50 mL), Na_2CO_3 (8.7 g, 81.9 mmol) and BnOCOCl (5.8 g, 33.8 mmol) were added. After stirring at 0 °C for 1 h, the solid was filtered off and washed with acetone (2x30 mL). The filtrates were concentrated *in vacuo* and the residue was purified by column chromatography on silica (100% CH_2Cl_2 to CH_2Cl_2/MeOH 20:1) to obtain alcohol **7** as a white solid (2.14 g, 43% yield).

Example 5:

(*S*)-2-(*N*-Benzyloxycarbonylamino)-butyraldehyde, 8.

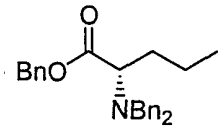


According to the method of Example 1, from alcohol **7** (750 mg, 3.4 mmol), aldehyde **8** was obtained as a yellow oil and used without further purification (700 mg, 94% yield).

R_f 0.31 ($MeOH/CH_2Cl_2$ 3:1).

Example 6:

Benzyl (*S*)-2-(*N,N*-dibenzylamino)-pentanoate, 9.



To a solution of L-norvaline (685 mg, 5.85 mmol) in MeCN (15 mL), BnBr (3.48 mL, 29.24 mmol) and K_2CO_3 (4.04 g, 29.24 mmol) were added. The mixture was stirred at 60 °C for 9 h, and then cooled down to room temperature and filtered, washing the solid with EtOAc. The filtrates were concentrated *in vacuo* and the residue purified by column chromatography on silica (100% hexane to hexane/EtOAc 5:1) to obtain benzyl ester **9** as a colorless oil (1.6 g, 71% yield).

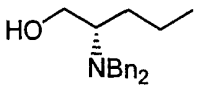
R_f 0.29 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 0.82 (t, 3H, *J*= 7.4 Hz), 1.25-1.40 (m, 1H), 1.45-1.60 (m, 1H), 1.70-1.85 (m, 2H), 3.42 (dd, 1H, *J*= 8.2, 6.7 Hz), 3.55 (d, 2H, *J*= 13.9 Hz), 3.96 (d, 2H, *J*= 13.9 Hz), 5.18 (d, 1H, *J*= 12.3 Hz), 5.30 (d, 1H, *J*= 12.3 Hz), 7.25-7.45 (m, 15H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 13.7, 19.3, 31.6, 54.4, 60.5, 65.8, 126.8, 128.1, 128.2, 128.4, 128.5, 128.8, 136.1, 139.7, 173.0.

Example 7:

(*S*)-2-(*N,N*-Dibenzylamino)-1-pentanol, 10.



To a cold (0 °C) suspension of $LiAlH_4$ (184 mg, 4.84 mmol) in THF (10 mL), a solution of ester **9** (375 mg, 0.97 mmol) in THF (2.5 mL) was added. The mixture was stirred at 0 °C for 2 h, and then quenched by dropwise addition of EtOH (3 mL). Na-K tartrate solution (10% aq, 30 mL) was added, and the crude was extracted with EtOAc (3x30 mL), dried over Na_2SO_4, concentrated *in vacuo* and purified by column chromatography on silica (hexane/EtOAc 5:1) to obtain alcohol **10** as a colorless oil (170 mg, 62% yield).

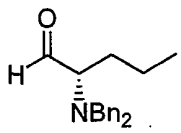
R_f 0.31 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 0.97 (t, 3H, *J*= 7.1 Hz), 1.17-1.42 (m, 3H), 1.71-1.76 (m, 1H), 2.80-2.86 (m, 1H), 3.25 (br s, 1H), 3.41-3.56 (m, 2H), 3.44 (d, 2H, *J*= 13.3 Hz), 3.85 (d, 2H, *J*= 13.3 Hz), 7.24-7.37 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.3, 20.3, 27.2, 53.1, 58.7, 60.8, 127.1, 128.4, 129.0, 139.3.

Example 8:

(*S*)-2-(*N*,*N*-Dibenzylamino)-pentanal, 11.



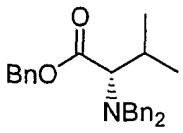
According to the method of Example 1, from alcohol **10** (163 mg, 0.58 mmol), aldehyde **11** was obtained as a yellow oil and used without further purification (140 g, 87% yield).

R_f 0.73 (hexane/EtOAc 10:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.89 (t, 3H, *J*= 7.3 Hz), 1.34-1.44 (m, 2H), 1.60-1.76 (m, 2H), 3.17 (t, 1H, *J*= 6.7 Hz), 3.73 (d, 2H, *J*= 13.8 Hz), 3.81 (d, 2H, *J*= 13.8 Hz), 7.23-7.40 (m, 10H), 9.74 (s, 1H).

Example 9:

Benzyl (*S*)-2-(*N,N*-dibenzylamino)-3-methylbutyrate, 12.



According to the method of Example 6, from L-valine (927 mg, 7.91 mmol), benzyl ester **12** was obtained as a colorless oil (2.58 g, 84% yield).

R_f 0.31 (hexane/EtOAc 10:1);

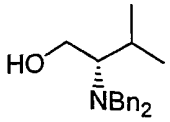
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.86 (d, 3H, *J*= 6.4 Hz), 1.11 (d, 3H, *J*= 6.5 Hz), 2.20-2.35 (m, 1H), 3.02 (d, 1H, *J*= 10.7 Hz), 3.39 (d, 2H, *J*= 13.9 Hz), 4.07 (d, 2H, *J*= 13.9 Hz), 5.25 (d, 1H, *J*= 12.3 Hz), 5.39 (d, 1H, *J*= 12.1 Hz), 7.27-7.54 (m, 15H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 19.5, 19.9, 27.2, 54.5, 65.6, 68.0, 126.9, 128.2, 128.3, 128.5, 128.6, 128.7, 136.1, 139.4, 171.8;

ESMS calcd for $C_{26}H_{30}NO_2$ (M+H) 388.2, found 388.2.

Example 10:

(*S*)-2-(*N,N*-Dibenzylamino)-3-methyl-1-butanol, 13.



According to the method of Example 7, from ester **12** (2.3 g, 5.93 mmol), alcohol **13** was obtained as a colorless oil (1.55 g, 92% yield).

R_f 0.24 (hexane/EtOAc 10:1);

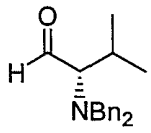
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.97 (dd, 3H, *J*= 6.5, 1.2 Hz), 1.17 (dd, 3H, *J*= 6.7, 1.2 Hz), 2.05-2.12 (m, 1H), 2.52-2.60 (m, 1H), 3.05 (br s, 1H), 3.47 (td, 1H, *J*= 10.2, 1.3 Hz), 3.61 (br d, 1H, *J*= 10.1 Hz), 3.71 (d, 2H, *J*= 13.3 Hz), 3.91 (d, 2H, *J*= 13.3 Hz), 7.23-7.36 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 20.1, 22.6, 27.5, 54.1, 59.1, 64.6, 127.1, 128.4, 129.1, 139.6;

ESMS calcd for $C_{19}H_{26}NO$ (M+H) 284.2, found 284.2.

Example 11:

(*S*)-2-(*N*,*N*-Dibenzylamino)-3-methylbutyraldehyde, 14.



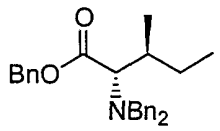
According to the method of Example 1, from alcohol **13** (450 mg, 1.59 mmol), aldehyde **14** was obtained as a yellow oil and used without further purification (447 mg, 100% yield).

R_f 0.57 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (d, 3H, *J*= 6.5 Hz), 1.08 (d, 3H, *J*= 6.5 Hz), 2.25-2.32 (m, 1H), 2.72 (dd, 1H, *J*= 10.2, 3.7 Hz), 3.70 (d, 2H, *J*= 13.6 Hz), 4.02 (d, 2H, *J*= 13.8 Hz), 7.24-7.38 (m, 10H), 9.85 (d, 1H, *J*= 3.5 Hz).

Example 12:

Benzyl (2*S*,3*S*)-2-(*N*,*N*-dibenzylamino)-3-methylpentanoate, 15.



According to the method of Example 6, from L-isoleucine (1.0 g, 7.6 mmol), benzyl ester **15** was obtained as a colorless oil (2.4 g, 80% yield).

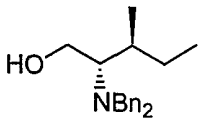
R_f 0.62 (hexane/EtOAc 20:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.71-0.79 (m, 6H), 1.09-1.21 (m, 1H), 1.82-2.01 (m, 2H), 3.02 (d, 1H, *J*= 6.5 Hz), 3.23 (d, 2H, *J*= 9.5 Hz), 3.89 (d, 2H, *J*= 9.5 Hz), 5.15 (d, 1H, *J*= 7.5 Hz), 5.24 (d, 1H, *J*= 7.5 Hz), 7.11-7.46 (m, 15H);

ESMS calcd for $C_{27}H_{32}NO_2$ (M+H) 402.2, found 402.5.

Example 13:

(2*S*,3*S*)-2-(*N*,*N*-Dibenzylamino)-3-methyl-1-pentanol, 16.



According to the method of Example 7, from ester **15** (0.50 g, 1.23 mmol), alcohol **16** was obtained as a colorless oil (0.36 g, 99% yield).

R_f 0.43 (hexane/EtOAc 9:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.92-0.99 (m, 6H), 1.13-1.18 (m, 1H), 1.63-1.67 (m, 1H), 1.88-1.97 (m, 1H), 2.63-2.67 (m, 1H), 3.45 (d, 2H, *J*=

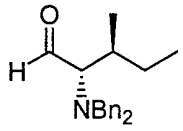
6.5 Hz), 3.49 (d, 2H, *J*= 9.5 Hz), 3.88 (d, 2H, *J*= 9.5 Hz), 7.18-7.42 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 11.4, 15.8, 28.2, 32.7, 53.9, 58.7, 62.7, 127.0, 128.3, 129.0, 139.7;

ESMS calcd for $C_{20}H_{28}NO$ (M+H) 298.4, found 298.4.

Example 14:

(2*S*,3*S*)-2-(*N*,*N*-Dibenzylamino)-3-methylpentanal, 17.



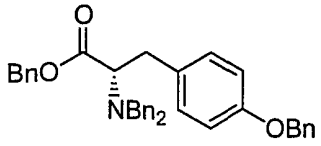
According to the method of Example 1, from alcohol **16** (479 mg, 1.61 mmol), aldehyde **17** was obtained as a yellow oil and used without further purification (470 mg, 98% yield).

R_f 0.71 (hexane/EtOAc 9:1);

^1H NMR (300 MHz, CD_3OD) δ 0.78-0.82 (m, 6H), 1.13-1.20 (m, 1H), 1.80-1.85 (m, 1H), 2.02-2.10 (m, 1H), 2.71 (dd, 1H, *J*= 7.8, 3.5 Hz), 3.61 (d, 2H, *J*= 11.8 Hz), 3.99 (d, 2H, *J*= 11.8 Hz), 7.15-7.29 (m, 10H), 9.77 (d, 1H, *J*= 2.0 Hz).

Example 15:

Benzyl (*S*)-3-(4'-benzyloxyphenyl)-2-(*N*,*N*-dibenzylamino)-propionate, 18.



According to the method of Example 6, from L-tyrosine (1.49 g, 8.22 mmol), ester **18** was obtained as a colorless oil (2.10 g, 47% yield).

R_f 0.25 (hexane/EtOAc 10:1);

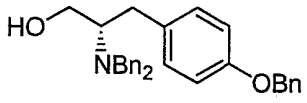
^{1}H NMR (300 MHz, $CDCl_3$) δ 3.06 (dd, 1H, *J*= 14.0, 8.1 Hz), 3.20 (dd, 1H, *J*= 14.0, 7.6 Hz), 3.65 (d, 2H, *J*= 13.9 Hz), 3.79 (t, 1H, *J*= 7.7 Hz), 4.04 (d, 2H, *J*= 13.9 Hz), 5.15 (s, 2H), 5.22 (d, 1H, *J*= 12.2 Hz), 5.33 (d, 1H, *J*= 12.2 Hz), 6.94 (d, 2H, *J*= 8.8 Hz), 7.03 (d, 2H, *J*= 8.5 Hz), 7.26-7.57 (m, 20H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 34.7, 54.3, 62.5, 65.9, 69.9, 102.1, 114.5, 126.8, 127.4, 127.8, 128.1, 128.2, 128.4, 128.5, 128.5, 128.6, 130.3, 135.9, 137.1, 139.2, 157.3, 172.1;

ESMS calcd for $C_{37}H_{36}NO_3$ (M+H) 542.3, found 542.3.

Example 16:

(*S*)-3-(4'-Benzyloxyphenyl)-2-(*N*,*N*-dibenzylamino)-1-propanol, 19.



According to the method of Example 7, from ester **18** (1.90 g, 3.51 mmol), alcohol **19** was obtained as a colorless oil (1.20 g, 78% yield).

R_f 0.15 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 2.45 (dd, 1H, *J*= 14.6, 10.7 Hz), 3.05-3.15 (m, 3H), 3.44 (br s, 1H), 3.52-3.60 (m, 1H), 3.55 (d, 2H, *J*= 13.3 Hz),

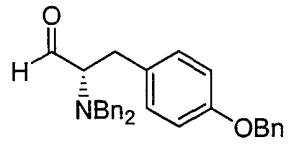
3.98 (d, 2H, *J*= 13.3 Hz), 5.10 (s, 2H), 6.97 (d, 2H, *J*= 8.6 Hz), 7.08 (d, 2H, *J*= 8.4 Hz), 7.29-7.52 (m, 15H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 30.8, 53.1, 60.3, 60.8, 69.9, 114.9, 127.2, 127.3, 127.8, 128.4, 128.5, 128.9, 129.8, 131.3, 137.0, 139.1, 157.2;

ESMS calcd for $C_{30}H_{32}NO_2$ (M+H) 438.2, found 438.3.

Example 17:

(*S*)-2-(*N*,*N*-dibenzylamino)-3-(4'-benzyloxyphenyl)-propionaldehyde, 20.



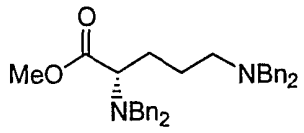
According to the method of Example 1, from alcohol **19** (600 mg, 1.37 mmol), aldehyde **20** was obtained as a yellow oil and used without further purification (597 mg, 100% yield).

R_f 0.38 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 2.89 (dd, 1H, *J*= 14.1, 6.1 Hz), 3.09 (dd, 1H, *J*= 14.1, 7.2 Hz), 3.51 (t, 1H, *J*= 6.8 Hz), 3.67 (d, 2H, *J*= 13.8 Hz), 3.82 (d, 2H, *J*= 13.8 Hz), 5.06 (s, 2H), 6.88 (d, 2H, *J*= 8.7 Hz), 7.06 (d, 2H, *J*= 8.6 Hz), 7.22-7.45 (m, 15H), 9.72 (s, 1H).

Example 18:

Methyl (*S*)-2,5-bis-(*N*,*N*-dibenzylamino)-pentanoate, 21.



According to the method of Example 6, from L-ornitine methyl ester (1.20 g, 5.48 mmol), ester **21** was obtained as a colorless oil (2.18 g, 79% yield).

R_f 0.27 (hexane/EtOAc 5:1);

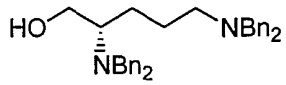
^{1}H NMR (300 MHz, $CDCl_3$) δ 1.50-1.60 (m, 1H), 1.75-1.90 (m, 3H), 2.41 (t, 2H, *J*= 6.7 Hz), 3.36 (t, 1H, *J*= 7.3 Hz), 3.55 (d, 2H, *J*= 13.8 Hz), 3.63 (d, 2H, *J*= 13.9 Hz), 3.65 (d, 2H, *J*= 13.6 Hz), 3.84 (s, 3H), 4.02 (d, 2H, *J*= 13.8 Hz), 7.29-7.45 (m, 20H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 23.6, 27.2, 50.8, 52.9, 54.5, 58.2, 60.6, 126.7, 126.9, 128.0, 128.1, 128.7, 128.8, 139.6, 139.7, 173.4;

ESMS calcd for $C_{34}H_{39}N_2O_2$ (M+H) 507.3, found 507.3.

Example 19:

(*S*)-2,5-Bis-(*N*,*N*-dibenzylamino)-1-pentanol, 22.



According to the method of Example 7, from ester **21** (1.75 g, 3.45 mmol), alcohol **22** was obtained as a colorless oil (1.50 g, 91% yield).

R_f 0.27 (hexane/EtOAc 5:1);

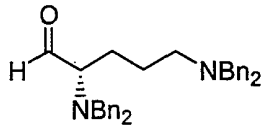
^{1}H NMR (300 MHz, $CDCl_3$) δ 1.25-1.35 (m, 1H), 1.53-1.63 (m, 2H), 1.78-1.89 (m, 1H), 2.60 (t, 2H, *J*= 6.8 Hz), 2.83-2.93 (m, 1H), 3.35 (br s, 1H), 3.53 (d, 2H, *J*= 13.3 Hz), 3.54-3.64 (m, 2H), 3.70 (d, 2H, *J*= 13.6 Hz), 3.76 (d, 2H, *J*= 13.8 Hz), 3.93 (d, 2H, *J*= 13.3 Hz), 7.36-7.59 (m, 20H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 22.7, 24.6, 53.0, 53.6, 58.4, 58.9, 60.7, 126.7, 127.0, 128.0, 128.2, 128.6, 128.8, 139.2, 139.6;

ESMS calcd for $C_{33}H_{39}N_2O$ (M+H) 479.3, found 479.3.

Example 20:

(*S*)-2,5-Bis-(*N*,*N*-dibenzylamino)-pentanal, 23.



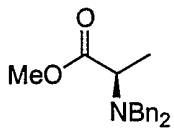
According to the method of Example 1, from alcohol **22** (505 mg, 1.05 mmol), aldehyde **23** was obtained as a yellow oil and used without further purification (503 mg, 100% yield).

R_f 0.57 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 1.30-1.40 (m, 1H), 1.55-1.70 (m, 2H), 1.75-1.85 (m, 1H), 2.35-2.45 (m, 2H), 3.02-3.08 (m, 1H), 3.52 (d, 2H, *J*= 13.6 Hz), 3.62 (d, 2H, *J*= 13.6 Hz), 3.71 (d, 2H, *J*= 13.8 Hz), 3.81 (d, 2H, *J*= 13.8 Hz), 7.28-7.41 (m, 20H), 9.69 (s, 1H).

Example 21:

Methyl (*R*)-2-(*N*,*N*-dibenzylamino)-propionate, 24.



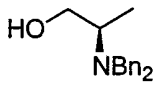
According to the method of Example 6, from D-alanine methyl ester (536 mg, 3.84 mmol), ester **24** was obtained as a colorless oil (625 mg, 57% yield).

R_f 0.40 (hexane/EtOAc 10:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 1.35 (d, 3H, *J*= 7.1 Hz), 3.53 (q, 1H, *J*= 7.0 Hz), 3.65 (d, 2H, *J*= 13.8 Hz), 3.75 (s, 3H), 3.85 (d, 2H, *J*= 13.8 Hz), 7.22-7.42 (m, 10H).

Example 22:

(*R*)-2-(*N,N*-dibenzylamino)-1-propanol, 25.



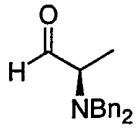
According to the method of Example 7, from ester **24** (625 mg, 2.20 mmol), alcohol **25** was obtained as a colorless oil (450 mg, 80% yield).

R_f 0.21 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.98 (d, 3H, *J*= 7.1 Hz), 2.95-3.05 (m, 1H), 3.13 (br s, 1H), 3.35 (d, 2H, *J*= 13.8 Hz), 3.40-3.55 (m, 2H), 3.81 (d, 2H, *J*= 13.8 Hz), 7.19-7.41 (m, 10H).

Example 23:

(*R*)-2-(*N,N*-Dibenzylamino)-propionaldehyde, 26.



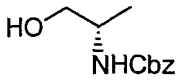
According to the method of Example 1, from alcohol **25** (475 mg, 1.86 mmol), aldehyde **26** was obtained as a yellow oil and used without further purification (445 mg, 94% yield).

R_f 0.57 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 1.18 (t, 3H, *J*= 6.7 Hz), 3.33 (q, 1H, *J*= 6.7 Hz), 3.57 (d, 2H, *J*= 13.8 Hz), 3.74 (d, 2H, *J*= 13.6 Hz), 7.23-7.42 (m, 10H), 9.73 (s, 1H).

Example 24:

(*S*)-2-(*N*-Benzyloxycarbonylamino)-1-propanol, 27.

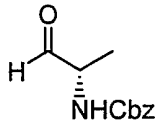


To a cold (-15 °C) solution of *N*-Cbz-L-alanine (1.0 g, 4.5 mmol) in THF (15 mL), Et_3N (360 mg, 4.5 mmol) and *i*-BuOCOCl (610 mg, 4.5 mmol) were added. After stirring at room temperature for 20 min, the solid Et_3N·HCl was filtered off and washed with THF. The filtrates were cooled to -15 °C and a solution of $NaBH_4$ (260 mg, 6.75 mmol) in H_2O (10 mL) was added. After 1 h, the reaction was quenched with H_2O (70 mL) and the THF removed *in vacuo*. The residue was extracted with EtOAc (3x30 mL), washed with brine (100 mL), dried over $MgSO_4$ and concentrated *in vacuo* to obtain alcohol **27** as a white solid (780 mg, 82% yield).

^{1}H NMR (500 MHz, $CDCl_3$) δ 1.15 (d, 3H, *J*= 6.8 Hz), 2.75-2.80 (m, 2H), 3.45-3.55 (m, 1H), 3.60-3.65 (m, 1H), 3.80-3.85 (m, 1H), 5.09 (s, 2H), 7.30-7.35 (m, 5H).

Example 25:

(*S*)-2-(*N*-Benzyloxycarbonylamino)-propionaldehyde, 28.

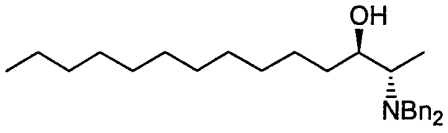


According to the method of Example 1, from alcohol **27** (750 mg, 3.6 mmol), aldehyde **28** was obtained as a yellow oil and used without further purification (680 mg, 92% yield).

R_f 0.31 ($MeOH/CH_2Cl_2$ 3:1).

Example 26:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-tetradecanol, 29.



To a suspension of Mg (155 mg, 6.38 mmol) and a few crystals of I_2 in THF (3.1 mL), an aliquot of 1-bromoundecane (0.25 mL, 1.12 mmol) was added and the mixture was stirred at 60 °C until the red color of the solution disappeared. Then the remainder of 1-bromoundecane (0.46 mL, 2.07 mmol) was added and the reaction was stirred at room temperature for 1 h. The Grignard solution formed thereof was cooled down to 0 °C and a solution of aldehyde **4** (323.5 mg, 1.28 mmol) in THF (1.6 mL) was added *via* cannula. After stirring overnight at room temperature, the reaction was quenched with HCl (3N, 10 mL), extracted with EtOAc (3x10 mL), washed successively with $NaHCO_3$ (20 mL, sat. aq.) and brine (20

mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (100% hexane to 10:1 hexane/EtOAc) to obtain a mixture of diastereoisomers. Further purification by HPLC on silica (95:5 to 80:20 hexane/MTBE) afforded pure *anti* alcohol **29** as a colorless oil (205 mg, 39% yield).

R_f 0.50 (hexane/EtOAc 5:1);

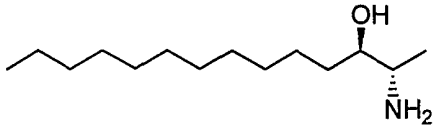
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.92 (t, 3H, *J*= 6.9 Hz), 1.13 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 18H), 1.65-1.80 (m, 2H), 1.87 (br s, 1H), 2.74 (quint, 1H, *J*= 6.7 Hz), 3.49 (d, 2H, *J*= 13.9 Hz), 3.57-3.65 (m, 1H), 3.79 (d, 2H, *J*= 13.8 Hz), 7.22-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.6, 29.7, 31.9, 34.3, 54.8, 57.3, 73.7, 126.9, 128.2, 128.8, 140.2;

ESMS calcd for $C_{28}H_{44}NO$ (M+H) 410.3, found 410.6.

Example 27:

(2*S*,3*R*)-2-Amino-3-tetradecanol, 30.



To a solution of *N*,*N*-dibenzylamine **29** (182 mg, 0.44 mmol) in MeOH (4.5 mL) at room temperature, $Pd(OH)_2$-C (20% wt, 24 mg, 0.04 mmol) was added. The mixture was purged with a stream of dry Ar, and then H_2. The reaction was stirred overnight under a H_2 atmosphere (1 atm). The catalyst was filtered off through a 0.45 μm teflon filter in polypropylene housing, washing the filter with MeOH (30 mL) and the solvent was evaporated *in vacuo*. The crude was purified by column

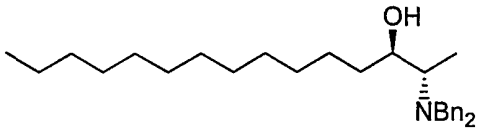
chromatography on silica (90:10 CH_2Cl_2/MeOH to 100% MeOH) to obtain aminoalcohol **30** as a white solid (87 mg, 85% yield).

^1H NMR (300 MHz, $CDCl_3$) □ 0.87 (t, 3H, *J*= 6.7 Hz), 1.03 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 18H), 1.45-1.55 (m, 2H), 2.66 (br s, 3H), 2.95-3.05 (m, 1H), 3.45-3.55 (m, 1H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.2, 22.7, 26.2, 29.3, 29.6, 29.8, 31.9, 32.5, 50.5, 74.2;

ESMS calcd for $C_{14}H_{32}NO$ (M+H) 230.2, found 230.4.

Example 28:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-pentadecanol, 31.



According to the method of Example 26, from aldehyde **4** (273 mg, 1.08 mmol) and 1-bromododecane (671 mg, 2.69 mmol), alcohol **31** was obtained as a colorless oil (195 mg, 43% yield).

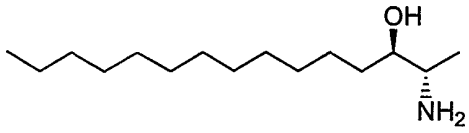
R_f 0.50 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 0.90 (t, 3H, *J*= 6.9 Hz), 1.12 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 20H), 1.65-1.75 (m, 2H), 1.82 (br s, 1H), 2.73 (quint, 1H, *J*= 6.7 Hz), 3.48 (d, 2H, *J*= 13.8 Hz), 3.57-3.65 (m, 1H), 3.78 (d, 2H, *J*= 13.8 Hz), 7.21-7.37 (m, 10H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.6, 29.7, 31.9, 34.3, 54.8, 57.3, 73.7, 126.9, 128.2, 128.8, 140.2;

ESMS calcd for $C_{29}H_{46}NO$ (M+H) 424.4, found 424.7.

Example 29:

(2*S*,3*R*)-2-Amino-3-pentadecanol, 32.



According to the method of Example 27, from *N,N*-dibenzylamine **31** (145 mg, 0.34 mmol), aminoalcohol **32** was obtained as a white solid (65 mg, 78% yield).

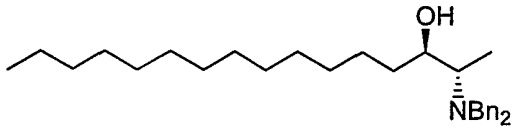
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.02 (d, 3H, *J*= 6.4 Hz), 1.20-1.40 (m, 20H), 1.45-1.55 (m, 2H), 2.38 (br s, 3H), 2.93-3.03 (m, 1H), 3.42-3.52 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.4, 22.7, 26.2, 29.3, 29.6, 29.8, 31.9, 32.5, 50.5, 74.4;

ESMS calcd for $C_{15}H_{34}NO$ (M+H) 244.3, found 244.4.

Example 30:

(2*S*,3*R*)-2-(*N,N*-Dibenzylamino)-3-hexadecanol, 33.



According to the method of Example 26, from aldehyde **4** (332 mg, 1.31 mmol) and 1-bromotridecane (863 mg, 3.28 mmol), alcohol **33** was obtained as a colorless oil (172 mg, 30% yield).

R_f 0.50 (hexane/EtOAc 5:1);

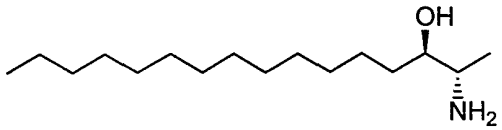
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.90 (t, 3H, *J*= 6.9 Hz), 1.12 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 22H), 1.65-1.75 (m, 2H), 1.84 (br s, 1H), 2.73 (quint, 1H, *J*= 6.5 Hz), 3.49 (d, 2H, *J*= 13.8 Hz), 3.57-3.65 (m, 1H), 3.78 (d, 2H, *J*= 13.8 Hz), 7.23-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.7, 31.9, 34.3, 54.8, 57.3, 73.6, 126.8, 128.2, 128.7, 140.2;

ESMS calcd for $C_{30}H_{48}NO$ (M+H) 438.4, found 438.7.

Example 31:

(2*S*,3*R*)-2-Amino-3-hexadecanol, 34.



According to the method of Example 27, from *N,N*-dibenzylamine **33** (149 mg, 0.34 mmol), aminoalcohol **34** was obtained as a white solid (62 mg, 71% yield).

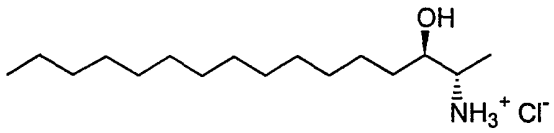
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 7.0 Hz), 1.05 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 22H), 1.45-1.55 (m, 2H), 2.95-3.10 (m, 4H), 3.48-3.58 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 15.9, 22.7, 26.2, 29.3, 29.6, 29.7, 29.7, 31.9, 32.6, 50.6, 73.9;

ESMS calcd for $C_{16}H_{36}NO$ (M+H) 258.3, found 258.5.

Example 32:

(2S,3*R*)-2-Amino-3-hexadecanol hydrochloride, 35.



To a solution of amine **34** (26 mg, 0.10 mmol) in dioxane (0.5 mL), anhydrous HCl solution in dioxane (5.3M, 0.38 mL, 2.02 mmol) was added. After stirring at room temperature for 5 h, the solvent was removed *in vacuo*. The resulting solid was washed with dioxane to obtain hydrochloride **35** as a white solid (19 mg, 64% yield).

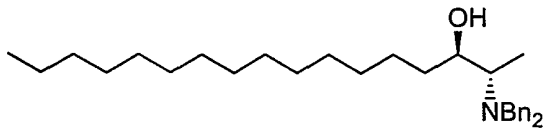
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.21 (d, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 22H), 1.45-1.60 (m, 2H), 3.27 (qd, 1H, *J*= 6.7, 3.0 Hz), 3.65-3.73 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 12.1, 14.4, 23.7, 27.0, 30.5, 30.6, 30.7, 30.7, 30.8, 33.1, 34.0, 52.6, 71.6;

ESMS calcd for $C_{16}H_{36}NO$ (M-Cl) 258.3, found 258.4.

Example 33:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-heptadecanol, 36.



According to the method of Example 26, from aldehyde **4** (309 mg, 1.21 mmol) and 1-bromotetradecane (1.34 g, 4.84 mmol), alcohol **36** was obtained as a colorless oil (270 mg, 49% yield).

R_f 0.50 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.91 (t, 3H, *J*= 6.9 Hz), 1.12 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 24H), 1.65-1.75 (m, 2H), 1.85 (br s, 1H), 2.73

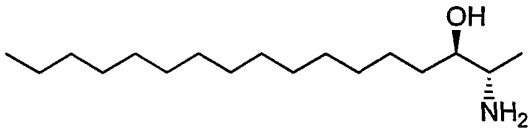
(quint, 1H, *J*= 6.4 Hz), 3.49 (d, 2H, *J*= 13.9 Hz), 3.57-3.65 (m, 1H), 3.78 (d, 2H, *J*= 13.8 Hz), 7.21-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.7, 31.9, 34.4, 54.8, 57.3, 73.6, 126.9, 128.2, 128.8, 140.2;

ESMS calcd for $C_{31}H_{50}NO$ (M+H) 452.4, found 452.5.

Example 34:

(2*S*,3*R*)-2-Amino-3-heptadecanol, 37.



According to the method of Example 27, from *N*,*N*-dibenzylamine **36** (182 mg, 0.40 mmol), aminoalcohol **37** was obtained as a white solid (81 mg, 74% yield).

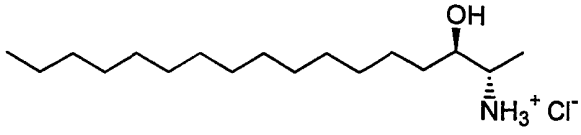
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 7.0 Hz), 1.02 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 24H), 1.45-1.55 (m, 2H), 1.85 (br s, 3H), 2.94-3.04 (m, 1H), 3.42-3.52 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.3, 22.7, 26.2, 29.3, 29.7, 31.9, 32.5, 50.4, 74.2;

ESMS calcd for $C_{17}H_{38}NO$ (M+H) 272.3, found 272.3.

Example 35:

(2*S*,3*R*)-2-Amino-3-heptadecanol hydrochloride, 38.

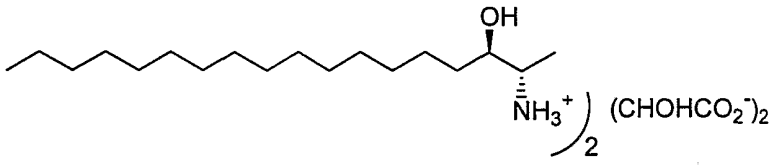


According to the method of Example 32, from aminoalcohol **37** (50 mg, 0.18 mmol), hydrochloride **38** was obtained as a white solid (41 mg, 73% yield).

^{1}H NMR (300 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 6.8 Hz), 1.22 (d, 3H, *J*= 6.8 Hz), 1.21-1.40 (m, 24H), 1.41-1.51 (m, 2H), 3.22-3.31 (m, 1H), 3.63-3.74 (m, 1H).

Example 36:

Bis-((2*S*,3*R*)-2-ammonium-3-octadecanol) L-tartrate, 40.



To a solution of aminoalcohol **1** (63 mg, 0.221 mmol) in MeOH (1.1 mL) at room temperature, L-tartaric acid (66 mg, 0.442 mmol) was added. After stirring for 16 h, the solvent was evaporated *in vacuo*. The resulting solid was washed with H_2O and dried under vacuum for 8 h to obtain tartrate **40** as a white solid (53 mg, 67% yield).

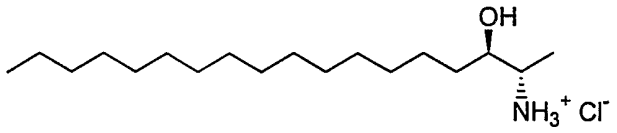
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.21 (d, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 26H), 1.40-1.55 (m, 2H), 3.26 (qd, 1H, *J*= 6.7, 3.0 Hz), 3.62-3.72 (m, 1H), 4.43 (d, 2H, *J*= 1.8 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 12.0, 14.4, 23.7, 27.0, 30.5, 30.8, 33.1, 34.0, 52.6, 71.7, 73.9;

ESMS calcd for $C_{18}H_{40}NO$ (M-$CHOHCO_2$) 286.3, found 286.2.

Example 37:

(2*S*,3*R*)-2-Amino-3-octadecanol hydrochloride, 41.



According to the method of Example 32, from aminoalcohol **1** (52.5 mg, 0.184 mmol), hydrochloride **41** was obtained as a white solid (52 mg, 88% yield).

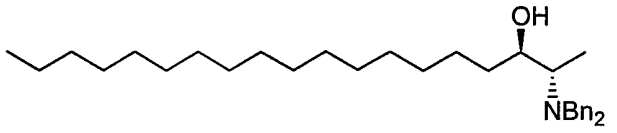
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.21 (d, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 26H), 1.40-1.55 (m, 2H), 3.26 (qd, 1H, *J*= 6.7, 3.0 Hz), 3.62-3.72 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 12.1, 14.5, 23.7, 27.0, 30.5, 30.7, 30.7, 30.8, 33.1, 34.0, 52.6, 71.6;

ESMS calcd for $C_{18}H_{40}NO$ (M-Cl) 286.3, found 286.2.

Example 38:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-nonadecanol, 42.



According to the method of Example 26, from aldehyde **4** (294 mg, 1.16 mmol) and 1-bromohexadecane (1.42 g, 4.64 mmol), alcohol **42** was obtained as a colorless oil (283 mg, 51% yield).

R_f 0.50 (hexane/EtOAc 5:1);

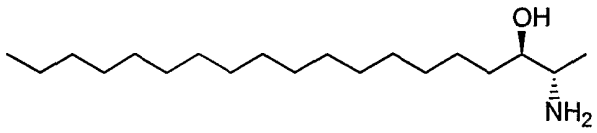
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.93 (t, 3H, *J*= 6.9 Hz), 1.14 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 28H), 1.65-1.80 (m, 2H), 1.95 (br s, 1H), 2.75 (quint, 1H, *J*= 6.5 Hz), 3.50 (d, 2H, *J*= 13.8 Hz), 3.57-3.65 (m, 1H), 3.80 (d, 2H, *J*= 13.8 Hz), 7.23-7.40 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.7, 31.9, 34.3, 54.7, 57.2, 73.6, 126.8, 128.2, 128.7, 140.1;

ESMS calcd for $C_{33}H_{54}NO$ (M+H) 480.4, found 480.5.

Example 39:

(2*S*,3*R*)-2-Amino-3-nonadecanol, 2.



According to the method of Example 27, from *N*,*N*-dibenzylamine **42** (204 mg, 0.43 mmol), aminoalcohol **2** was obtained as a white solid (91 mg, 72% yield).

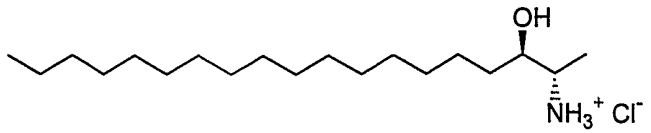
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.9 Hz), 1.01 (d, 3H, *J*= 6.4 Hz), 1.20-1.40 (m, 28H), 1.45-1.55 (m, 2H), 1.77 (br s, 3H), 2.92-3.02 (m, 1H), 3.39-3.49 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.7, 22.7, 26.2, 29.3, 29.6, 29.7, 29.8, 31.9, 32.4, 50.3, 74.6;

ESMS calcd for $C_{19}H_{42}NO$ (M+H) 300.3, found 300.3.

Example 40:

(2*S*,3*R*)-2-Amino-3-nonadecanol hydrochloride, 43.

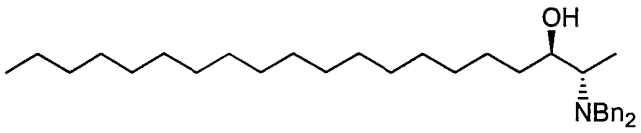


According to the method of Example 32, from aminoalcohol **2** (530 mg, 1.70 mmol), hydrochloride **43** was obtained as a white solid (454 mg, 76% yield).

^{1}H NMR (300 MHz, CD_3OD) δ 0.86 (t, 3H, *J*= 6.8 Hz), 1.35 (d, 3H, *J*= 6.8 Hz), 1.20-1.41 (m, 28H), 1.41-1.51 (m, 2H), 3.24-3.37 (m, 1H), 3.65-3.73 (m, 1H).

Example 41:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-eicosanol, 44.



According to the method of Example 26, from aldehyde **4** (410 mg, 1.62 mmol) and 1-bromoheptadecane (2.07 g, 6.47 mmol), alcohol **44** was obtained as a colorless oil (427 mg, 53% yield).

R_f 0.50 (hexane/EtOAc 5:1);

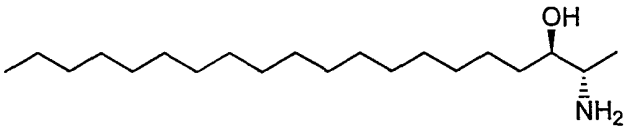
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.93 (t, 3H, *J*= 6.9 Hz), 1.14 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 30H), 1.65-1.80 (m, 2H), 1.94 (br s, 1H), 2.75 (quint, 1H, *J*= 6.7 Hz), 3.51 (d, 2H, *J*= 13.8 Hz), 3.56-3.64 (m, 1H), 3.80 (d, 2H, *J*= 13.8 Hz), 7.23-7.40 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.6, 29.7, 31.9, 34.3, 54.8, 57.3, 73.6, 126.8, 128.2, 128.7, 140.2;

ESMS calcd for $C_{34}H_{56}NO$ (M+H) 494.4, found 494.5.

Example 42:

(2*S*,3*R*)-2-Amino-3-eicosanol, 3.



According to the method of Example 27, from *N,N*-dibenzylamine **44** (294 mg, 0.60 mmol), aminoalcohol **3** was obtained as a white solid (140 mg, 75% yield).

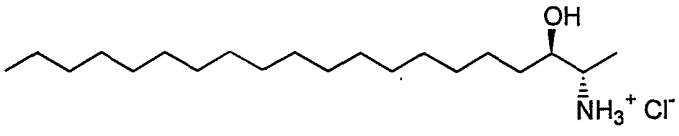
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.7 Hz), 1.00 (d, 3H, *J*= 6.4 Hz), 1.20-1.40 (m, 30H), 1.45-1.55 (m, 2H), 1.70 (br s, 3H), 2.92-3.02 (m, 1H), 3.39-3.49 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.8, 22.7, 26.2, 29.3, 29.7, 29.8, 31.9, 32.5, 50.4, 74.7;

ESMS calcd for $C_{20}H_{44}NO$ (M+H) 314.3, found 314.3.

Example 43:

(2*S*,3*R*)-2-Amino-3-eicosanol hydrochloride, 45.



According to the method of Example 32, from aminoalcohol **3** (12 mg, 0.04 mmol), hydrochloride **45** was obtained as a white solid (11 mg, 82% yield).

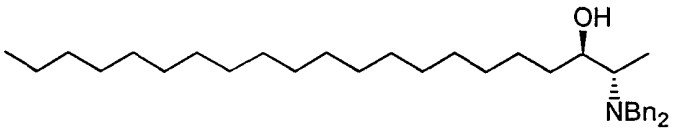
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.5 Hz), 1.21 (d, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 30H), 1.45-1.60 (m, 2H), 3.26 (qd, 1H, *J*= 6.9, 3.0 Hz), 3.63-3.73 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 12.1, 14.4, 23.7, 27.8, 30.5, 30.6, 30.8, 33.1, 34.0, 52.6, 71.7;

ESMS calcd for $C_{20}H_{44}NO$ (M-Cl) 314.3, found 314.5.

Example 44:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-heneicosanol, 46.



According to the method of Example 26, from aldehyde **4** (350 mg, 1.38 mmol) and 1-bromooctadecane (1.15 g, 3.45 mmol), alcohol **46** was obtained as a colorless oil (395 mg, 56% yield).

R_f 0.50 (hexane/EtOAc 5:1);

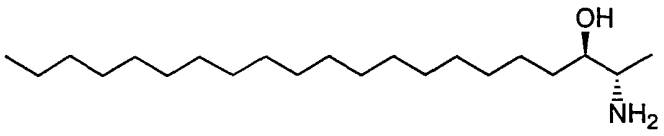
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.91 (t, 3H, *J*= 6.9 Hz), 1.14 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 32H), 1.65-1.75 (m, 2H), 1.80 (br s, 1H), 2.75 (quint, 1H, *J*= 6.7 Hz), 3.51 (d, 2H, *J*= 13.9 Hz), 3.56-3.64 (m, 1H), 3.80 (d, 2H, *J*= 13.8 Hz), 7.23-7.40 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.7, 31.9, 34.3, 54.8, 57.2, 73.6, 126.8, 128.2, 128.7, 140.1;

ESMS calcd for $C_{35}H_{58}NO$ (M+H) 508.4, found 508.4.

Example 45:

(2*S*,3*R*)-2-Amino-3-heneicosanol, 47.



According to the method of Example 27, from *N,N*-dibenzylamine **46** (228 mg, 0.45 mmol), aminoalcohol **47** was obtained as a white solid (125 mg, 85% yield).

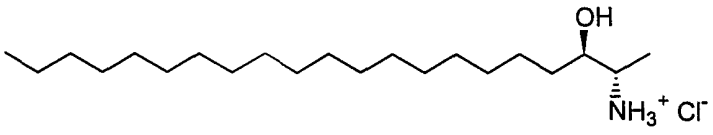
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.00 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 32H), 1.45-1.55 (m, 2H), 1.86 (br s, 3H), 2.92-3.02 (m, 1H), 3.39-3.49 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.8, 22.7, 26.2, 29.3, 29.7, 29.8, 31.9, 32.5, 50.4, 74.7;

ESMS calcd for $C_{21}H_{46}NO$ (M+H) 328.3, found 328.3.

Example 46:

(2*S*,3*R*)-2-Amino-3-heneicosanol hydrochloride, 48.



According to the method of Example 32, from aminoalcohol **47** (32.5 mg, 0.10 mmol), hydrochloride **48** was obtained as a white solid (32 mg, 89% yield).

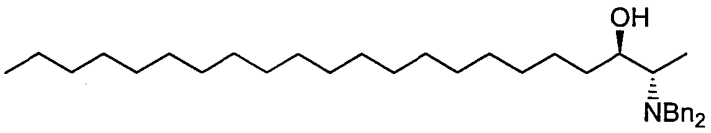
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.6 Hz), 1.21 (d, 3H, *J*= 6.9 Hz), 1.25-1.40 (m, 32H), 1.45-1.60 (m, 2H), 3.27 (qd, 1H, *J*= 6.9, 3.0 Hz), 3.65-3.73 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 12.1, 14.5, 23.8, 27.0, 30.5, 30.7, 30.7, 30.8, 33.1, 34.0, 52.6, 71.6;

ESMS calcd for $C_{21}H_{46}NO$ (M-Cl) 328.3, found 328.5.

Example 47:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-docosanol, 49.



According to the method of Example 26, from aldehyde **4** (380 mg, 1.50 mmol) and 1-bromononadecane (1.30 g, 3.75 mmol), alcohol **49** was obtained as a colorless oil (349 mg, 45% yield).

R_f 0.50 (hexane/EtOAc 5:1);

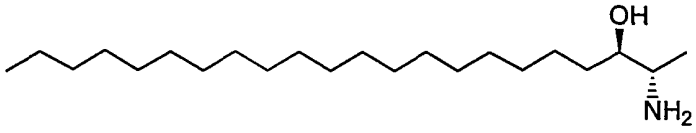
^1H NMR (300 MHz, $CDCl_3$) δ 0.91 (t, 3H, *J*= 6.9 Hz), 1.14 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 34H), 1.65-1.75 (m, 2H), 1.81 (br s, 1H), 2.75 (quint, 1H, *J*= 6.7 Hz), 3.51 (d, 2H, *J*= 13.9 Hz), 3.56-3.64 (m, 1H), 3.80 (d, 2H, *J*= 13.8 Hz), 7.23-7.40 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.7, 31.9, 34.3, 54.8, 57.2, 73.6, 126.8, 128.2, 128.7, 140.1;

ESMS calcd for $C_{36}H_{60}NO$ (M+H) 522.5, found 522.4.

Example 48:

(2*S*,3*R*)-2-Amino-3-docosanol, 50.



According to the method of Example 27, from *N,N*-dibenzylamine **49** (206 mg, 0.39 mmol), aminoalcohol **50** was obtained as a white solid (100 mg, 74% yield).

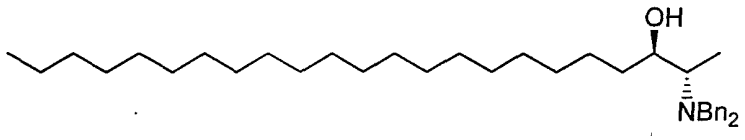
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.00 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 34H), 1.45-1.55 (m, 2H), 1.65 (br s, 3H), 2.92-3.02 (m, 1H), 3.39-3.49 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.8, 22.7, 26.2, 29.3, 29.7, 29.8, 31.9, 32.5, 50.4, 74.7;

ESMS calcd for $C_{22}H_{48}NO$ (M+H) 342.4, found 342.4.

Example 49:

(2*S*,3*R*)-2-(*N,N*-Dibenzylamino)-3-tricosanol, 51.



According to the method of Example 26, from aldehyde **4** (365 mg, 1.44 mmol) and 1-bromoeicosadecane (1.30 g, 3.60 mmol), alcohol **51** was obtained as a colorless oil (317 mg, 41% yield).

R_f 0.50 (hexane/EtOAc 5:1);

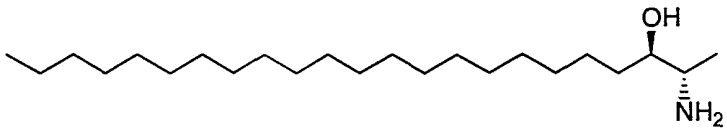
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.91 (t, 3H, *J*= 6.9 Hz), 1.14 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 36H), 1.65-1.75 (m, 2H), 1.81 (br s, 1H), 2.75 (quint, 1H, *J*= 6.7 Hz), 3.51 (d, 2H, *J*= 13.9 Hz), 3.56-3.64 (m, 1H), 3.80 (d, 2H, *J*= 13.8 Hz), 7.23-7.40 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.6, 25.8, 29.3, 29.7, 31.9, 34.3, 54.7, 57.2, 73.6, 126.8, 128.2, 128.7, 140.1;

ESMS calcd for $C_{37}H_{62}NO$ (M+H) 536.5, found 536.5.

Example 50:

(2*S*,3*R*)-2-Amino-3-tricosanol, 52.



According to the method of Example 27, from *N,N*-dibenzylamine **51** (191 mg, 0.36 mmol), aminoalcohol **52** was obtained as a white solid (103 mg, 81% yield).

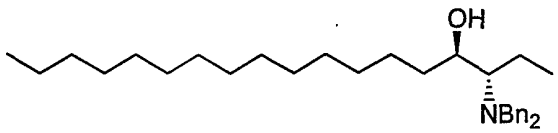
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.00 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 36H), 1.45-1.55 (m, 2H), 1.65 (br s, 3H), 2.92-3.02 (m, 1H), 3.39-3.49 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.8, 22.7, 26.2, 29.3, 29.7, 29.8, 31.9, 32.5, 50.4, 74.7;

ESMS calcd for $C_{23}H_{50}NO$ (M+H) 356.4, found 356.4.

Example 51:

(3*S*,4*R*)-3-(*N,N*-Dibenzylamino)-4-octadecanol, 53.



According to the method of Example 26, from aldehyde **6** (660 mg, 2.47 mmol) and 1-bromotetradecane (1.71 g, 6.17 mmol), alcohol **53** was obtained as a colorless oil (535 mg, 47% yield).

R_f 0.50 (hexane/EtOAc 5:1);

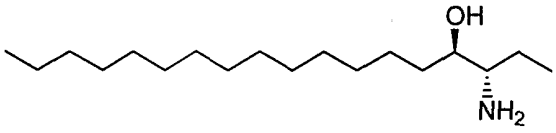
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.92 (t, 3H, *J*= 6.6 Hz), 1.02 (t, 3H, *J*= 7.4 Hz), 1.20-1.40 (m, 24H), 1.45-1.60 (m, 3H), 1.70-1.85 (m, 1H), 2.27 (br s, 1H), 2.62 (td, 1H, *J*= 7.0, 4.2 Hz), 3.60-3.75 (m, 5H), 7.22-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.3, 14.1, 18.1, 22.7, 26.6, 29.4, 29.6, 29.7, 31.9, 34.4, 55.2, 62.8, 70.6, 126.9, 128.2, 128.9, 140.1;

ESMS calcd for $C_{32}H_{52}NO$ (M+H) 466.4, found 466.4.

Example 52:

(3*S*,4*R*)-3-Amino-4-octadecanol, 54.



According to the method of Example 27, from *N*,*N*-dibenzylamine **53** (166 mg, 0.36 mmol), aminoalcohol **54** was obtained as a white solid (100 mg, 98% yield).

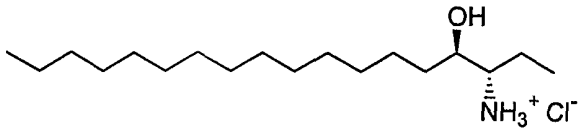
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.89 (t, 3H, *J*= 6.6 Hz), 1.00 (t, 3H, *J*= 7.5 Hz), 1.20-1.40 (m, 26H), 1.45-1.60 (m, 2H), 2.05 (br s, 3H), 2.64-2.70 (m, 1H), 3.42-3.50 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 11.0, 14.1, 22.7, 24.8, 26.2, 29.3, 29.6, 29.7, 29.8, 31.5, 31.9, 57.1, 74.0;

ESMS calcd for $C_{18}H_{40}NO$ (M+H) 286.3, found 286.2.

Example 53:

(3*S*,4*R*)-3-Amino-4-octadecanol hydrochloride, 55.



According to the method of Example 32, from aminoalcohol **54** (52 mg, 0.18 mmol), hydrochloride **55** was obtained as a white solid (38 mg, 65% yield).

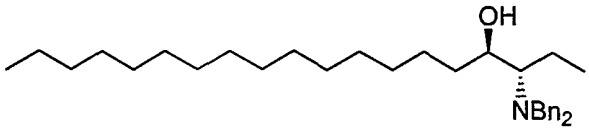
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.04 (t, 3H, *J*= 7.4 Hz), 1.25-1.50 (m, 26H), 1.55-1.80 (m, 2H), 3.04-3.12 (m, 1H), 3.70-3.80 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 10.6, 14.5, 21.4, 23.8, 27.1, 30.5, 30.6, 30.7, 30.8, 33.0, 33.1, 59.0, 71.4;

ESMS calcd for $C_{18}H_{40}NO$ (M-Cl) 286.3, found 286.2.

Example 54:

(3*S*,4*R*)-3-(*N*,*N*-Dibenzylamino)-4-nonadecanol, 56.

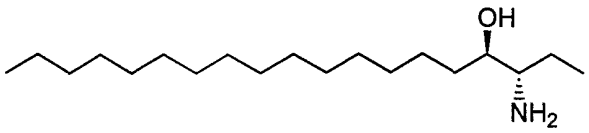


According to the method of Example 26, from aldehyde **6** (1.0 g, 3.7 mmol) and 1-bromopentadecane (6.55 g, 22.5 mmol), alcohol **56** was obtained as a colorless oil (800 mg, 45% yield).

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.8 Hz), 0.99 (t, 3H, *J*= 7.4 Hz), 1.20-1.35 (m, 26H), 1.40-1.55 (m, 3H), 1.70-1.80 (m, 1H), 2.56-2.62 (m, 1H), 3.60-3.75 (m, 5H), 7.26-7.46 (m, 10H).

Example 55:

(3*S*,4*R*)-3-Amino-4-nonadecanol, 57.



According to the method of Example 27, from *N*,*N*-dibenzylamine **56** (400 mg, 0.83 mmol), aminoalcohol **57** was obtained as a white solid (220 mg, 88% yield).

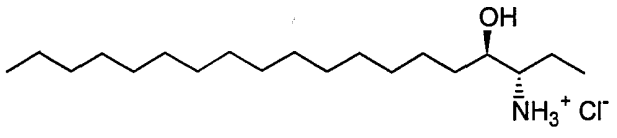
^{1}H NMR (500 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 7.1 Hz), 0.91 (t, 3H, *J*= 7.5 Hz), 1.15-1.25 (m, 26H), 1.30-1.40 (m, 2H), 1.40-1.50 (m, 1H), 1.55-1.65 (m, 1H), 2.70-2.75 (m, 1H), 3.45-3.50 (m, 1H);

^{13}C NMR (125 MHz, CD_3OD) δ 11.8, 15.4, 24.5, 24.7, 28.1, 31.4, 31.7, 33.9, 34.0, 59.8, 74.3;

ESMS calcd for $C_{19}H_{42}NO$ (M+H) 300.3, found 300.4.

Example 56:

(3*S*,4*R*)-3-Amino-4-nonadecanol hydrochloride, 58.



According to the method of Example 32, from aminoalcohol **57** (20 mg, 0.07 mmol), hydrochloride **58** was obtained as a white solid (6 mg, 27% yield).

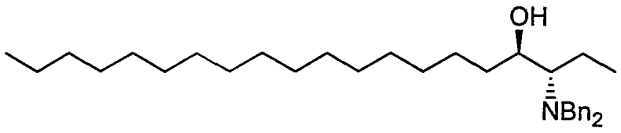
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.6 Hz), 1.04 (t, 3H, *J*= 7.6 Hz), 1.25-1.50 (m, 28H), 1.55-1.80 (m, 2H), 3.04-3.12 (m, 1H), 3.70-3.80 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 10.6, 14.4, 21.4, 23.8, 27.1, 30.5, 30.6, 30.8, 33.0, 33.1, 59.0, 71.4;

ESMS calcd for $C_{19}H_{42}NO$ (M-Cl) 300.3, found 300.5.

Example 57:

(3*S*,4*R*)-3-(*N*,*N*-Dibenzylamino)-4-eicosanol, 59.



According to the method of Example 26, from aldehyde **6** (600 mg, 2.24 mmol) and 1-bromohexadecane (1.37 mL, 4.49 mmol), alcohol **59** was obtained as a colorless oil (775 mg, 70% yield).

R_f 0.50 (hexane/EtOAc 9:1);

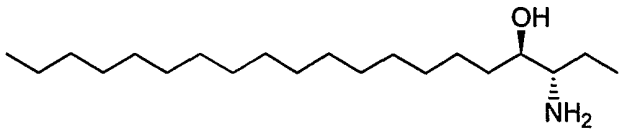
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 7.1 Hz), 0.95 (t, 3H, *J*= 7.1 Hz), 1.20-1.40 (m, 28H), 1.45-1.60 (m, 3H), 1.70-1.85 (m, 1H), 2.22 (br s, 1H), 2.62-2.68 (m, 1H), 3.62-3.73 (m, 5H), 7.24-7.34 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.3, 14.1, 18.1, 22.6, 26.6, 29.3, 29.6, 29.7, 31.9, 34.4, 55.1, 62.7, 70.5, 126.9, 128.2, 128.9, 140.1;

ESMS calcd for $C_{34}H_{56}NO$ (M+H) 494.4, found 494.5.

Example 58:

(3*S*,4*R*)-3-Amino-4-eicosanol, 60.



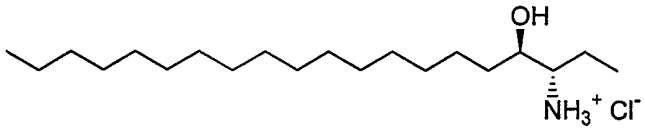
According to the method of Example 27, from *N,N*-dibenzylamine **59** (200 mg, 0.40 mmol), aminoalcohol **60** was obtained as a white solid (104 mg, 83% yield).

^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.9 Hz), 0.89 (t, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 30H), 1.45-1.53 (m, 2H), 2.55-3.20 (m, 4H), 3.50-3.61 (m, 1H);

ESMS calcd for $C_{20}H_{44}NO$ (M+H) 314.3, found 314.4.

Example 59:

(3*S*,4*R*)-3-Amino-4-eicosanol hydrochloride, 61.



According to the method of Example 32, from aminoalcohol **60** (30.0 mg, 0.17 mmol), hydrochloride **61** was obtained as a white solid (20.4 mg, 61% yield).

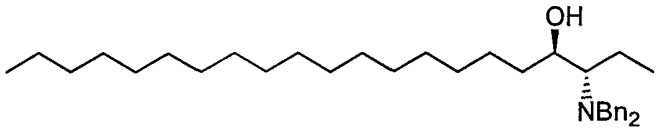
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 7.4 Hz), 1.04 (t, 3H, *J*= 7.4 Hz), 1.25-1.50 (m, 30H), 1.55-1.80 (m, 2H), 3.04-3.12 (m, 1H), 3.70-3.80 (m, 1H);

^{13}C NMR (75MHz, $CDCl_3$) δ 10.5, 14.4, 21.3, 23.7, 27.1, 30.4, 30.6, 30.7, 30.8, 32.9, 33.0, 59.0, 71.4;

ESMS calcd for $C_{20}H_{44}NO$ (M-Cl) 314.3, found 314.5.

Example 60:

(3*S*,4*R*)-3-(*N*,*N*-Dibenzylamino)-4-heneicosanol, 62.



According to the method of Example 26, from aldehyde **6** (610 mg, 2.28 mmol) and 1-bromoheptadecane (1.82 g, 5.70 mmol), alcohol **62** was obtained as a colorless oil (620 mg, 54% yield).

R_f 0.50 (hexane/EtOAc 5:1);

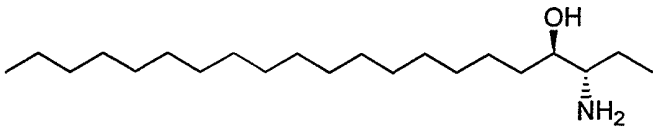
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.86 (t, 3H, *J*= 6.9 Hz), 0.94 (t, 3H, *J*= 7.3 Hz), 1.20-1.40 (m, 30H), 1.45-1.55 (m, 3H), 1.70-1.85 (m, 1H), 2.24 (br s, 1H), 2.73 (td, 1H, *J*= 7.0, 4.2 Hz), 3.60-3.75 (m, 5H), 7.22-7.36 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.3, 14.1, 18.1, 22.7, 26.7, 29.4, 29.6, 29.7, 31.9, 34.4, 55.2, 62.8, 70.6, 126.9, 128.3, 128.9, 140.1;

ESMS calcd for $C_{35}H_{58}NO$ (M+H) 508.4, found 508.5.

Example 61:

(3*S*,4*R*)-3-Amino-4-heneicosanol, 63.



According to the method of Example 27, from *N*,*N*-dibenzylamine **62** (295 mg, 0.58 mmol), aminoalcohol **63** was obtained as a white solid (184 mg, 97% yield).

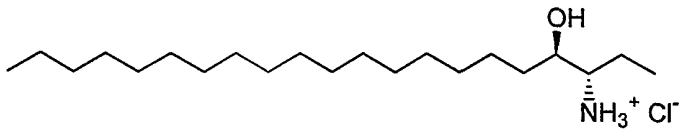
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 7.0 Hz), 0.94 (t, 3H, *J*= 7.4 Hz), 1.20-1.40 (m, 32H), 1.45-1.60 (m, 2H), 1.79 (br s, 3H), 2.62-2.70 (m, 1H), 3.42-3.50 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 11.0, 14.1, 22.7, 25.0, 26.2, 29.3, 29.7, 29.8, 31.4, 31.9, 57.1, 74.1;

ESMS calcd for $C_{21}H_{46}NO$ (M+H) 328.3, found 328.4.

Example 62:

(3*S*,4*R*)-3-Amino-4-heneicosanol hydrochloride, 64.



According to the method of Example 32, from aminoalcohol **63** (74 mg, 0.23 mmol), hydrochloride **64** was obtained as a white solid (51 mg, 62% yield).

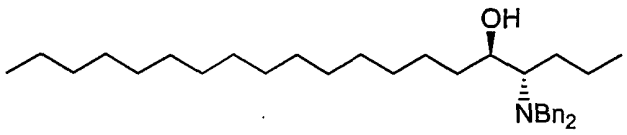
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.9 Hz), 1.04 (t, 3H, *J*= 7.4 Hz), 1.25-1.50 (m, 32H), 1.55-1.80 (m, 2H), 3.04-3.12 (m, 1H), 3.70-3.80 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 10.6, 14.5, 21.4, 23.7, 27.1, 30.5, 30.6, 30.7, 30.8, 33.0, 33.1, 59.0, 71.4;

ESMS calcd for $C_{21}H_{46}NO$ (M-Cl) 328.3, found 328.4.

Example 63:

(4*S*,5*R*)-4-(*N*,*N*-Dibenzylamino)-5-eicosanol, 65.



According to the method of Example 26, from aldehyde **11** (123 mg, 0.44 mmol) and 1-bromopentadecane (318 mg, 1.09 mmol), alcohol **65** was obtained as a colorless oil (161 mg, 75% yield).

R_f 0.53 (hexane/EtOAc 5:1);

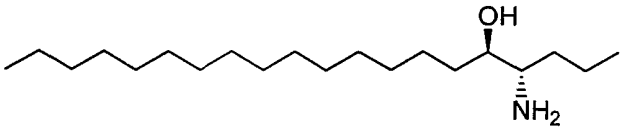
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.89 (t, 3H, *J*= 6.9 Hz), 0.91 (t, 3H, *J*= 7.0 Hz), 1.20-1.40 (m, 28H), 1.40-1.55 (m, 3H), 1.70-1.80 (m, 1H), 2.22 (br s, 1H), 2.65-2.72 (m, 1H), 3.60-3.75 (m, 5H), 7.21-7.35 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 14.4, 20.6, 22.7, 26.7, 27.5, 29.4, 29.6, 29.6, 29.7, 31.9, 34.4, 55.2, 60.7, 70.7, 127.0, 128.3, 128.9, 140.1;

ESMS calcd for $C_{34}H_{56}NO$ (M+H) 494.4, found 494.4.

Example 64:

(4*S*,5*R*)-4-Amino-5-eicosanol, 66.



According to the method of Example 27, from *N*,*N*-dibenzylamine **65** (37 mg, 0.075 mmol), aminoalcohol **66** was obtained as a white solid (17 mg, 72% yield).

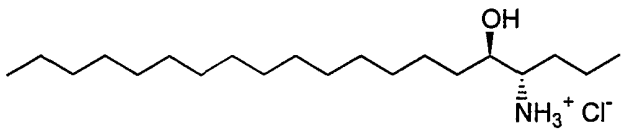
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.7 Hz), 0.93 (t, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 30H), 1.45-1.55 (m, 2H), 2.75-2.80 (m, 1H), 3.40-3.45 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 19.7, 22.7, 26.2, 29.4, 29.7, 31.4, 31.9, 34.4, 55.0, 74.4;

ESMS calcd for $C_{20}H_{44}NO$ (M+H) 314.3, found 314.3.

Example 65:

(4*S*,5*R*)-4-Amino-5-eicosanol hydrochloride, 67.



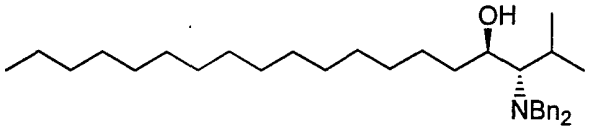
According to the method of Example 32, from aminoalcohol **66** (9 mg, 0.03 mmol), hydrochloride **67** was obtained as a white solid (3 mg, 30% yield).

^1H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.9 Hz), 0.99 (t, 3H, *J*= 7.0 Hz), 1.20-1.40 (m, 28H), 1.40-1.65 (m, 4H), 3.08-3.18 (m, 1H), 3.65-3.75 (m, 1H);

ESMS calcd for $C_{20}H_{44}NO$ (M-Cl) 314.3, found 314.5.

Example 66:

(3*S*,4*R*)-3-(*N*,*N*-Dibenzylamino)-2-methyl-4-nonadecanol, 68.



According to the method of Example 26, from aldehyde **14** (447 mg, 1.59 mmol) and 1-bromopentadecane (1.16 g, 4.0 mmol), alcohol **68** was obtained as a colorless oil (340 mg, 43% yield).

R_f 0.50 (hexane/EtOAc 5:1);

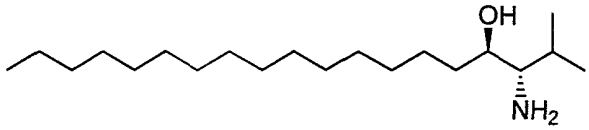
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.93 (t, 3H, *J*= 7.0 Hz), 0.96 (d, 3H, *J*= 6.5 Hz), 1.25-1.40 (m, 29H), 1.55-1.70 (m, 2H), 2.19-2.27 (m, 1H), 2.56 (dd, 1H, *J*= 9.7, 4.7 Hz), 2.84 (br d, 1H, *J*= 7.9 Hz), 3.55-3.65 (m, 1H), 3.79 (d, 2H, *J*= 13.4 Hz), 3.90 (d, 2H, *J*= 13.4 Hz), 7.25-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 20.8, 22.7, 23.2, 27.1, 28.2, 29.3, 29.6, 29.6, 31.9, 33.2, 56.3, 67.2, 70.3, 127.2, 128.4, 129.1, 139.9;

ESMS calcd for $C_{34}H_{56}NO$ (M+H) 494.4, found 494.4.

Example 67:

(3*S*,4*R*)-3-Amino-2-methyl-4-nonadecanol, 69.



According to the method of Example 27, from *N*,*N*-dibenzylamine **68** (171 mg, 0.35 mmol), aminoalcohol **69** was obtained as a white solid (90 mg, 83% yield).

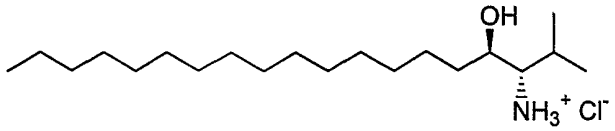
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.85 (t, 3H, *J*= 7.0 Hz), 0.88 (d, 3H, *J*= 6.7 Hz), 0.95 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.50-1.65 (m, 3H), 2.02 (br s, 3H), 2.41 (dd, 1H, *J*= 7.9, 4.7 Hz), 3.54-3.62 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 19.2, 19.8, 22.6, 26.1, 29.3, 29.6, 29.7, 29.7, 30.4, 30.8, 31.9, 61.7, 71.5;

ESMS calcd for $C_{20}H_{44}NO$ (M+H) 314.3, found 314.3.

Example 68:

(3*S*,4*R*)-3-Amino-2-methyl-4-nonadecanol hydrochloride, 70.



According to the method of Example 32, from aminoalcohol **69** (68.5 mg, 0.22 mmol), hydrochloride **70** was obtained as a white solid (55.5 mg, 73% yield).

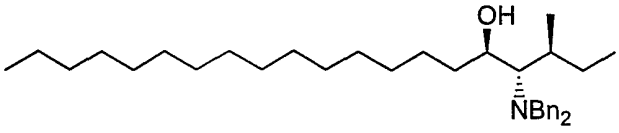
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.01 (d, 3H, *J*= 6.7 Hz), 1.05 (d, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 26H), 1.55-1.70 (m, 2H), 1.88-1.96 (m, 1H), 2.84 (dd, 1H, *J*= 8.6, 4.1 Hz), 3.80-3.85 (m, 1H);

^{13}C NMR (75 MHz, $CDOD_3$) δ 14.5, 19.5, 19.9, 23.7, 27.0, 28.7, 30.5, 30.6, 30.7, 30.8, 31.1, 33.1, 63.8, 69.5;

ESMS calcd for $C_{20}H_{44}NO$ (M-Cl) 314.3, found 314.4.

Example 69:

(3*S*,4*S*,5*R*)-4-(*N*,*N*-Dibenzylamino)-3-methyl-5-eicosanol, 71.



According to the method of Example 26, from aldehyde **17** (470 mg, 1.59 mmol) and 1-bromopentadecane (0.63 mL, 3.18 mmol), alcohol **71** was obtained as a colorless oil (499 mg, 60% yield).

R_f 0.60 (hexane/EtOAc 9:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.85-0.90 (m, 6H), 0.98 (d, 3H, *J*= 7.4 Hz), 1.25-1.40 (m, 27H), 1.55-1.60 (m, 2H), 1.86-1.97 (m, 2H), 2.54-2.60

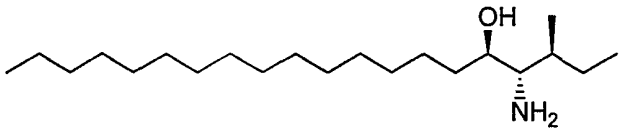
(m, 2H), 3.58-3.68 (m, 1H), 3.70 (d, 2H, *J*= 13.7 Hz), 3.85 (d, 2H, *J*= 13.7 Hz), 7.25-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 11.3, 14.1, 16.1, 22.6, 26.8, 28.1, 29.3, 29.5, 29.6, 31.8, 33.4, 34.2, 56.1, 65.5, 70.3, 127.1, 128.3, 129.1, 138.9;

ESMS calcd for $C_{35}H_{58}NO$ (M+H) 508.4, found 508.8.

Example 70:

(3*S*,4*S*,5*R*)-4-Amino-3-methyl-5-eicosanol, 72.



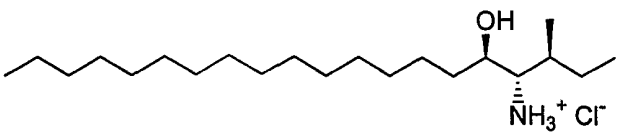
According to the method of Example 27, from *N*,*N*-dibenzylamine **71** (70 mg, 0.13 mmol), aminoalcohol **72** was obtained as a white solid (40 mg, 89% yield).

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.91-1.10 (m, 6H), 1.15-1.46 (m, 31H), 2.45-2.51 (m, 2H), 1.65-1.69 (m, 1H), 2.68-2.72 (m, 1H), 3.62-3.69 (m, 1H), 4.25-4.60 (m, 2H);

ESMS calcd for $C_{21}H_{46}NO$ (M+H) 328.3, found 328.4.

Example 71:

(3*S*,4*S*,5*R*)-4-Amino-3-methyl-5-eicosanol hydrochloride, 73.



According to the method of Example 32, from aminoalcohol **72** (40 mg, 0.11 mmol), hydrochloride **73** was obtained as a white solid (32 mg, 78% yield).

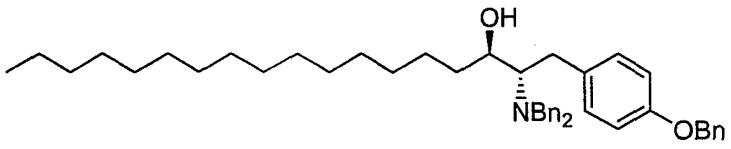
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 0.95 (t, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 31H), 1.45-1.60 (m, 2H), 1.75-1.85 (m, 1H), 3.18-3.23 (m, 1H), 3.90-3.95 (m, 1H), 7.90-8.05 (br s, 3H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 10.5, 14.1, 15.6, 22.6, 25.3, 26.1, 29.3, 29.6, 29.7, 31.9, 33.7, 61.6, 70.1;

ESMS calcd for $C_{21}H_{46}NO$ (M-Cl) 328.3, found 328.4.

Example 72:

(2*S*,3*R*)-1-(4'-Benzyloxyphenyl)-2-(*N*,*N*-dibenzylamino)-3-octadecanol, 74.



According to the method of Example 26, from aldehyde **20** (597 mg, 1.37 mmol) and 1-bromopentadecane (999 mg, 3.43 mmol), alcohol **74** was obtained as a colorless oil (496 mg, 56% yield).

R_f 0.50 (hexane/EtOAc 10:1);

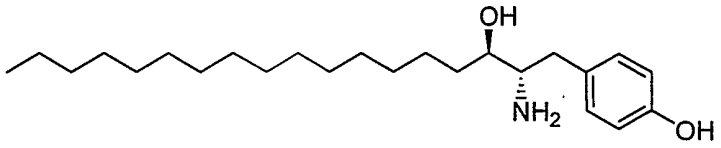
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 26H), 1.55-1.70 (m, 2H), 1.96 (br s, 1H), 2.43 (dd, 1H, *J*= 12.4, 5.2 Hz), 2.95-3.07 (m, 2H), 3.65 (d, 2H, *J*= 13.8 Hz), 3.65-3.75 (m, 1H), 3.78 (d, 2H, *J*= 13.8 Hz), 5.09 (s, 2H), 6.92 (d, 2H, *J*= 8.6 Hz), 7.07 (d, 2H, *J*= 8.6 Hz), 7.20-7.49 (m, 15H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.7, 26.4, 29.4, 29.5, 29.6, 29.7, 31.0, 31.9, 34.6, 55.1, 63.2, 70.1, 71.6, 114.8, 126.9, 127.4, 127.9, 128.2, 128.6, 128.8, 130.2, 132.8, 137.2, 139.8, 157.1;

ESMS calcd for $C_{45}H_{62}NO_2$ (M+H) 648.5, found 648.5.

Example 73:

(2*S*,3*R*)-2-Amino-1-(4'-hydroxyphenyl)-3-octadecanol, 75.



According to the method of Example 27, from *N,N*-dibenzylamine **74** (140 mg, 0.22 mmol), aminoalcohol **75** was obtained as a white solid (80 mg, 98% yield).

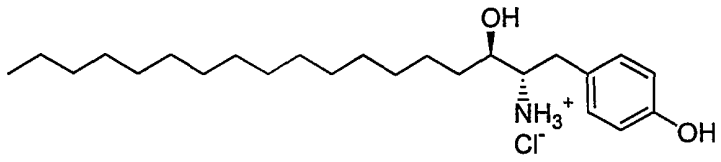
^1H NMR (300 MHz, CD_3OD) δ 0.89 (d, 3H, *J*= 6.6 Hz), 1.25-1.40 (m, 26H), 1.50-1.65 (m, 2H), 2.35-2.44 (m, 1H), 2.81-2.92 (m, 2H), 3.45-3.50 (m, 1H), 6.73 (d, 2H, *J*= 8.2 Hz), 7.03 (d, 2H, *J*= 8.2 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.5, 23.7, 27.2, 30.5, 30.8, 30.8, 33.1, 33.4, 38.3, 58.7, 74.8, 116.4, 130.9, 131.2, 157.1;

ESMS calcd for $C_{24}H_{44}NO_2$ (M+H) 378.3, found 378.3.

Example 74:

(2*S*,3*R*)-2-Amino-1-(4'-hydroxyphenyl)-3-octadecanol hydrochloride, 76.



According to the method of Example 32, from aminoalcohol **75** (43 mg, 0.11 mmol), hydrochloride **76** was obtained as a white solid (10 mg, 21% yield).

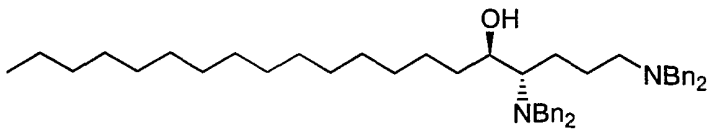
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.45-1.60 (m, 2H), 2.72 (dd, 1H, *J*= 14.3, 9.3 Hz), 2.92 (dd, 1H, *J*= 14.3, 5.4 Hz), 3.39 (ddd, 1H, *J*= 9.1, 5.5, 3.2 Hz), 3.66-3.75 (m, 1H), 6.78 (d, 2H, *J*= 8.6 Hz), 7.10 (d, 2H, *J*= 8.6 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.5, 23.8, 27.1, 30.5, 30.6, 30.7, 30.7, 30.8, 33.1, 33.6, 59.0, 71.3, 116.8, 127.9, 131.3, 157.9;

ESMS calcd for $C_{24}H_{44}NO_2$ (M-Cl) 378.3, found 378.3.

Example 75:

(4*S*,5*R*)-1,4-Bis-(*N*,*N*-dibenzylamino)-5-eicosanol, 77.



According to the method of Example 26, from aldehyde **23** (503 mg, 1.05 mmol) and 1-bromopentadecane (768 mg, 2.64 mmol), alcohol **77** was obtained as a colorless oil (350 mg, 48% yield).

R_f 0.50 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.25-1.40 (m, 28H), 1.40-1.60 (m, 2H), 1.60-1.75 (m, 2H), 1.97 (br s, 1H), 2.43 (t, 2H, *J*=

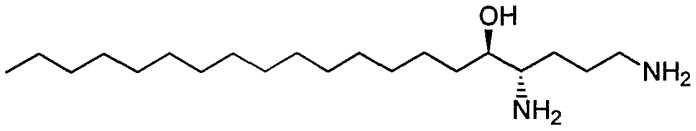
6.7 Hz), 2.56-2.62 (m, 1H), 3.57 (s, 4H), 3.61 (d, 2H, *J*= 13.8 Hz), 3.65-3.75 (m, 1H), 3.67 (d, 2H, *J*= 13.8 Hz), 7.20-7.40 (m, 20H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.7, 23.1, 25.1, 26.6, 29.4, 29.6, 29.7, 31.9, 34.6, 53.9, 55.1, 58.4, 61.2, 70.9, 126.8, 127.0, 128.1, 128.3, 128.8, 128.9, 139.8, 140.1;

ESMS calcd for $C_{48}H_{69}N_2O$ (M+H) 689.5, found 689.5.

Example 76:

(4*S*,5*R*)-1,4-Diamino-5-eicosanol, 78.



According to the method of Example 27, from bis-(*N*,*N*-dibenzylamine) **77** (105 mg, 0.15 mmol), diaminoalcohol **78** was obtained as a white solid (45 mg, 91% yield).

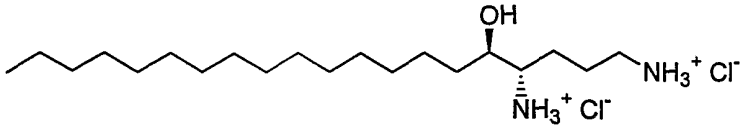
^{1}H NMR (300 MHz, CD_3OD) δ 0.88 (d, 3H, *J*= 6.7 Hz), 1.25-1.45 (m, 28H), 1.60-1.75 (m, 4H), 2.65-2.85 (m, 3H), 3.42-3.52 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 14.4, 23.7, 26.9, 27.2, 28.8, 30.5, 30.8, 33.1, 33.4, 41.1, 56.9, 74.6;

ESMS calcd for $C_{20}H_{45}N_2O$ (M+H) 329.3, found 329.3.

Example 77:

(4*S*,5*R*)-1,4-Diamino-5-eicosanol dihydrochloride, 79.



According to the method of Example 32, from diaminoalcohol **78** (40 mg, 0.12 mmol), dihydrochloride **79** was obtained as a white solid (30 mg, 61% yield).

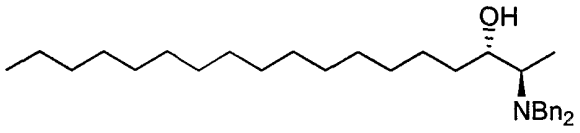
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (d, 3H, *J*= 6.5 Hz), 1.25-1.40 (m, 26H), 1.45-1.60 (m, 3H), 1.70-1.95 (m, 3H), 2.98 (t, 2H, *J*= 7.0 Hz), 3.20-3.25 (m, 1H), 3.72-3.80 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 14.5, 23.7, 25.1, 25.5, 27.1, 30.5, 30.7, 30.8, 30.8, 33.1, 33.3, 40.4, 56.9, 71.5;

ESMS calcd for $C_{20}H_{45}N_2O$ (M-HCl_2) 329.3, found 329.4.

Example 78:

(2*R*,3*S*)-2-(*N*,*N*-Dibenzylamino)-3-octadecanol, 80.



According to the method of Example 26, from aldehyde **26** (445 mg, 1.76 mmol) and 1-bromopentadecane (1.28 g, 4.39 mmol), alcohol **80** was obtained as a colorless oil (422 mg, 52% yield).

R_f 0.50 (hexane/EtOAc 5:1);

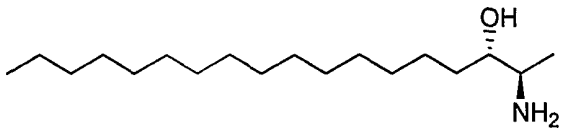
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.91 (t, 3H, *J*= 6.9 Hz), 1.12 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.65-1.75 (m, 2H), 1.85 (br s, 1H), 2.73 (quint, 1H, *J*= 6.4 Hz), 3.49 (d, 2H, *J*= 13.9 Hz), 3.57-3.65 (m, 1H), 3.78 (d, 2H, *J*= 13.8 Hz), 7.21-7.38 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.6, 14.1, 22.7, 25.9, 29.3, 29.6, 29.7, 31.9, 34.4, 54.8, 57.3, 73.6, 126.9, 128.2, 128.8, 140.2;

ESMS calcd for $C_{32}H_{52}NO$ (M+H) 466.4, found 466.4.

Example 79:

(2*R*,3*S*)-2-Amino-3-octadecanol, 81.



According to the method of Example 27, from *N*,*N*-dibenzylamine **80** (256 mg, 0.55 mmol), aminoalcohol **81** was obtained as a white solid (175 mg, 92% yield).

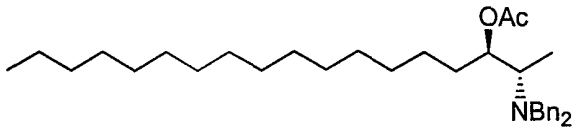
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 7.0 Hz), 1.02 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 26H), 1.45-1.55 (m, 2H), 1.85 (br s, 3H), 2.94-3.04 (m, 1H), 3.42-3.52 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 16.3, 22.7, 26.2, 29.3, 29.7, 31.9, 32.5, 50.4, 74.2;

ESMS calcd for $C_{18}H_{40}NO$ (M+H) 286.3, found 286.2.

Example 80:

(2*S*,3*R*)-*O*-Acetyl-2-(*N*,*N*-dibenzylamino)-3-octadecanol, 82.



To a solution of alcohol **39** (48.5 mg, 0.104 mmol) in CH_2Cl_2 (1.0 mL) at room temperature, pyridine (25 μL, 0.313 mmol), Ac_2O (29 μL, 0.313 mmol) and DMAP (ca. 5 mg, cat.) were added. The reaction was

stirred for 4 h, and then the solvents were evaporated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 10:1) to obtain acetate **82** as a colorless oil (46 mg, 87% yield).

R_f 0.62 (hexane/EtOAc 5:1);

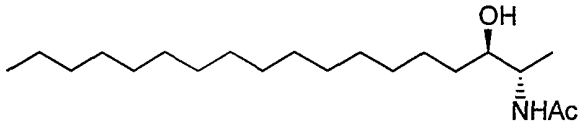
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.91 (t, 3H, *J*= 6.8 Hz), 1.07 (d, 3H, *J*= 6.6 Hz), 1.20-1.35 (m, 26H), 1.40-1.50 (m, 1H), 1.75-1.85 (m, 1H), 2.02 (s, 3H), 2.81 (quint, 1H, *J*= 7.1 Hz), 3.46 (d, 2H, *J*= 13.9 Hz), 3.76 (d, 2H, *J*= 13.9 Hz), 5.11 (dt, 1H, *J*= 7.5, 4.2 Hz), 7.22-7.39 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.7, 14.1, 21.2, 22.7, 24.8, 29.3, 29.5, 29.6, 29.7, 31.9, 32.0, 54.2, 54.7, 75.2, 126.8, 128.1, 12.8, 140.0, 170.8;

ESMS calcd for $C_{34}H_{54}NO_2$ (M+H) 508.4, found 508.5.

Example 81:

(2*S*,3*R*)-2-(*N*-Acetylamino)-3-octadecanol, 83.



According to the method of Example 27, from *N*,*N*-dibenzylamine **82** (41 mg, 0.081 mmol), acetamide **83** was obtained as a white solid (13 mg, 49% yield).

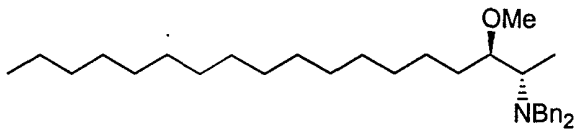
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.89 (t, 3H, *J*= 7.1 Hz), 1.09 (d, 3H, *J*= 6.8 Hz), 1.20-1.35 (m, 26H), 1.45-1.55 (m, 2H), 1.99 (s, 3H), 2.15 (br s, 1H), 3.60-3.65 (m, 1H), 4.00 (dquint, 1H, *J*= 7.4, 2.4 Hz), 5.84 (br d, 1H, *J*= 7.1 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 13.9, 14.1, 22.7, 23.5, 26.0, 29.4, 29.6, 29.7, 31.9, 33.6, 49.5, 74.2, 82.4, 170.0;

ESMS calcd for $C_{20}H_{41}NO_2Na$ (M+Na) 350.3, found 350.3.

Example 82:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-3-(methoxy)-octadecane, 84.



To a solution of alcohol **39** (322 mg, 0.69 mmol) in DMF (3.5 mL) at room temperature, NaH (60% mineral dispersion, 69 mg, 1.73 mmol) and MeI (0.22 mL, 3.46 mmol) were added. After stirring for 16 h, the mixture was quenched with H_2O (15 mL), extracted with Et_2O (3x15 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 15:1) to obtain **84** as a colorless oil (110 mg, 33% yield).

R_f 0.56 (hexane/EtOAc 10:1);

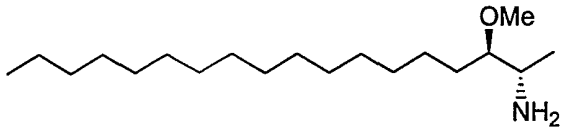
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.94 (t, 3H, *J*= 6.7 Hz), 1.08 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.55-1.70 (m, 2H), 2.74 (quint, 1H, *J*= 6.7 Hz), 3.27 (q, 1H, *J*= 6.4 Hz), 3.36 (s, 3H), 3.50 (d, 2H, *J*= 13.8 Hz), 3.77 (d, 2H, *J*= 13.8 Hz), 7.23-7.42 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.2, 14.1, 22.7, 24.4, 29.4, 29.7, 29.7, 29.7, 30.0, 30.6, 31.9, 54.3, 54.7, 57.4, 83.7, 126.7, 128.1, 128.8, 140.4;

ESMS calcd for $C_{33}H_{54}NO$ (M+H) 480.4, found 480.7.

Example 83:

(2*S*,3*R*)-2-Amino-3-(methoxy)-octadecane, 85.



According to the method of Example 27, from *N,N*-dibenzylamine **84** (54 mg, 0.11 mmol), amine **85** was obtained as a white solid (14 mg, 42% yield).

R_f 0.10 (hexane/EtOAc 1:1);

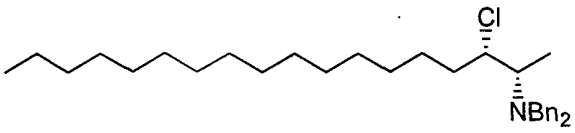
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.6 Hz), 1.03 (d, 3H, *J*= 6.7 Hz), 1.20-1.35 (m, 26H), 1.40-1.55 (m, 2H), 1.96 (br s, 2H), 2.94-3.00 (m, 1H), 3.03-3.10 (m, 1H), 3.38 (s, 3H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 18.3, 22.7, 26.0, 29.1, 29.3, 29.6, 29.6, 29.7, 29.9, 31.9, 47.9, 57.9, 75.0, 85.7;

ESMS calcd for $C_{19}H_{42}NO$ (M+H) 300.3, found 300.5.

Example 84:

(2*S*,3*S*)-2-(*N,N*-Dibenzylamino)-3-chloro-octadecane, 86.



To a cold (0 °C) solution of alcohol **39** (24 mg, 0.051 mmol) in 1 mL of pyridine, $POCl_3$ (0.019 mL, 0.206 mmol) was added dropwise. After stirring at room temperature for 3 h, 0.2 mL of H_2O were added and the solvent was evaporated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 10:1) to give chloride **86** as a colorless oil (14 mg, 56% yield).

R_f 0.56 (hexane/EtOAc 10:1);

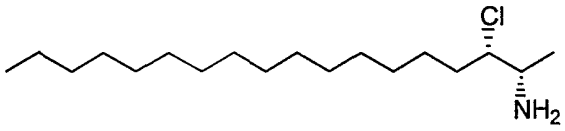
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.89 (t, 3H, *J*= 6.6 Hz), 1.20-1.55 (m, 30H), 2.00-2.10 (m, 1H), 2.87 (quint, 1H, *J*= 7.0 Hz), 3.47 (d, 2H, *J*= 13.8 Hz), 3.75 (d, 2H, *J*= 13.6 Hz), 3.98 (td, 1H, *J*= 8.1, 3.5 Hz), 7.21-7.36 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 10.2, 14.1, 22.7, 26.0, 29.2, 29.4, 29.5, 29.6, 29.7, 31.9, 35.6, 54.3, 57.3, 66.9, 126.9, 128.2, 128.8, 139.8;

ESMS calcd for $C_{32}H_{51}ClN$ (M+H) 484.4, found 484.3.

Example 85:

(2*S*,3*S*)-2-Amino-3-chloro-octadecane, 87.



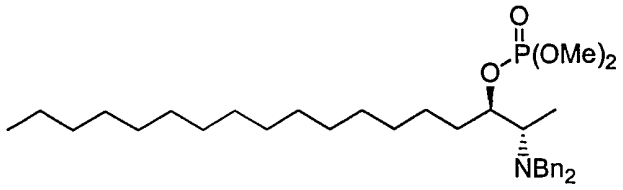
According to the method of Example 27, from *N*,*N*-dibenzylamine **86** (13 mg, 0.027 mmol), amine **87** was obtained as a white solid (3 mg, 37% yield).

R_f 0.10 (EtOAc); ^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.6 Hz), 1.12 (d, 3H, *J*= 6.6 Hz), 1.20-1.70 (m, 30H), 3.09 (qd, 1H, *J*= 6.2, 3.4 Hz), 3.90 (td, 1H, *J*= 6.5, 3.5 Hz);

ESMS calcd for $C_{18}H_{38}N$ (M-Cl) 268.3, found 268.2.

Example 86:

(2*S*,3*R*)-2-(*N*,*N*-Dibenzylamino)-*O*-(dimethylphosphate)-3-octadecanol, 88.



To a solution of alcohol **39** (44 mg, 0.095 mmol) and CBr_4 (47 mg, 0.142 mmol) in 0.3 mL of pyridine, $(MeO)_3P$ (0.022 mL, 0.189 mmol) was added dropwise. After stirring at room temperature for 24 h, the mixture was diluted with EtOAc (10 mL), washed successively with 5% HCl (10 mL), $NaHCO_3$ (10 mL, sat. aq.) and brine (10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 10:1 to 2:1) to give dimethyl phosphate **88** as a colorless oil (20 mg, 37% yield) together with unreacted alcohol (25 mg, 57% yield).

R_f 0.31 (hexane/EtOAc 2:1);

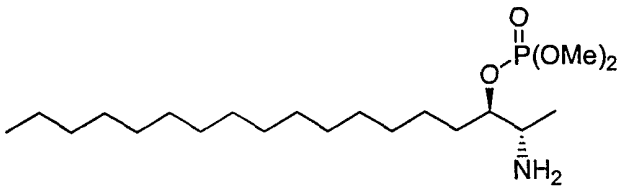
^1H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.5 Hz), 1.16 (d, 3H, *J*= 6.5 Hz), 1.20-1.40 (m, 26H), 1.65-1.80 (m, 2H), 2.84 (quint, 1H, *J*= 6.9 Hz), 3.40 (d, 2H, *J*= 13.8 Hz), 3.69 (dd, 3H, *J*= 2.3, 0.5 Hz), 3.73 (dd, 3H, *J*= 2.3, 0.5 Hz), 3.73 (d, 2H, *J*= 13.6 Hz), 4.47 (ddd, 1H, *J*= 12.8, 7.4, 4.9 Hz), 7.20-7.34 (m, 10H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 8.5, 14.1, 22.7, 23.4, 29.3, 29.5, 29.6, 29.6, 29.7, 31.9, 32.6, 54.0 (d), 54.1 (d), 54.2, 81.7 (d), 126.9, 128.2, 128.9, 139.8;

ESMS calcd for $C_{34}H_{57}NO_4P$ (M+H) 574.4, found 574.4.

Example 87:

(2*S*,3*R*)-2-Amino-*O*-(dimethylphosphate)-3-octadecanol, 89.



According to the method of Example 27, from *N,N*-dibenzylamine **88** (16 mg, 0.028 mmol), amine **89** was obtained as a white solid (6 mg, 55% yield).

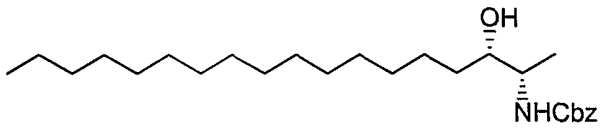
R_f 0.32 (EtOAc/MeOH 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.6 Hz), 1.08 (d, 3H, *J*= 6.6 Hz), 1.20-1.40 (m, 26H), 1.45-1.55 (m, 1H), 1.60-1.70 (m, 1H), 1.97 (br s, 2H), 3.12-3.20 (m, 1H), 3.76 (s, 3H), 3.80 (s, 3H), 4.24-4.34 (m, 1H);

ESMS calcd for $C_{20}H_{45}NO_4P$ (M+H) 394.3, found 394.3.

Example 88:

(2*S*,3*S*)-2-(*N*-Benzyloxycarbonylamino)-3-octadecanol, 90.

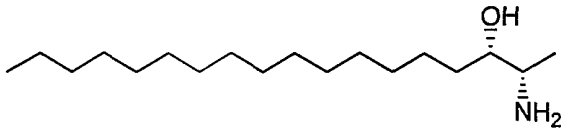


According to the method of Example 26, from aldehyde **28** (640 mg, 3.1 mmol) and 1-bromopentadecane (5.0 g, 17.2 mmol), alcohol **90** was obtained as a colorless oil (690 mg, 53% yield).

^{1}H NMR (500 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 7.1 Hz), 1.20 (d, 3H, *J*= 6.8 Hz), 1.20-1.35 (m, 26H), 1.40-1.50 (m, 2H), 1.74 (br s, 1H), 3.48-3.52 (m, 1H), 3.70-3.75 (m, 1H), 4.90-4.95 (m, 1H), 5.10 (s, 2H), 7.30-7.36 (m, 5H).

Example 89:

(2*S*,3*S*)-2-Amino-3-octadecanol, 91.



To a solution of *N*-benzyloxycarbonylamine **90** (330 mg, 0.79 mmol) in MeOH (40 mL) at room temperature, Pd-C (10% wt, 100 mg, 0.09 mmol) was added. The mixture was purged with a stream of dry Ar, and then H_2. The reaction was stirred overnight under a H_2 atmosphere (1 atm). The catalyst was filtered off through a 0.45 μm teflon filter in polypropylene housing, washing the filter with MeOH (50 mL) and the solvent was evaporated *in vacuo*. The crude was purified by column chromatography on silica (90:10 CH_2Cl_2/MeOH to 100% MeOH) to obtain aminoalcohol **91** as a white solid (200 mg, 89% yield).

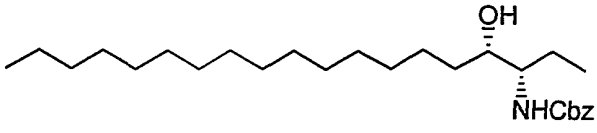
^{1}H NMR (500 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 7.2 Hz), 0.98 (d, 3H, *J*= 6.5 Hz), 1.15-1.30 (m, 26H), 1.40-1.45 (m, 2H), 2.62-2.65 (m, 1H), 3.10-3.15 (m, 1H);

^{13}C NMR (125 MHz, CD_3OD) δ 14.8, 19.2, 24.1, 27.2, 20.9, 31.1, 33.5, 35.0, 53.0, 77.1;

ESMS calcd for $C_{18}H_{40}NO$ (M+H) 286.3, found 286.4.

Example 90:

(3*S*,4*S*)-3-(*N*-Benzyloxycarbonylamino)-4-nonadecanol, 92.

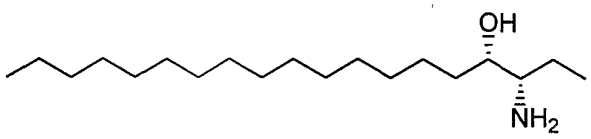


According to the method of Example 26, from aldehyde **8** (680 mg, 3.1 mmol) and 1-bromopentadecane (6.55 g, 22.5 mmol), alcohol **92** was obtained as a colorless oil (800 mg, 60% yield).

^{1}H NMR (500 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 7.1 Hz), 0.96 (t, 3H, *J*= 7.4 Hz), 1.20-1.35 (m, 26H), 1.40-1.45 (m, 2H), 1.55-1.60 (m, 1H), 1.65-1.70 (m, 1H), 3.46-3.52 (m, 1H), 3.60-3.65 (m, 1H), 4.91 (d, 1H, *J*= 9.3 Hz), 5.11 (s, 2H), 7.30-7.36 (m, 5H).

Example 91:

(3*S*,4*S*)-3-Amino-4-nonadecanol, 93.



According to the method of Example 89, from *N*-benzyloxycarbonylamine **92** (230 mg, 0.53 mmol), aminoalcohol **93** was obtained as a white solid (140 mg, 89% yield).

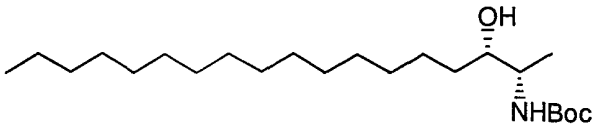
^{1}H NMR (500 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 7.1 Hz), 0.93 (t, 3H, *J*= 7.5 Hz), 1.15-1.25 (m, 26H), 1.30-1.40 (m, 2H), 1.40-1.50 (m, 1H), 1.65-1.75 (m, 1H), 2.80-2.85 (m, 1H), 3.45-3.50 (m, 1H);

^{13}C NMR (125 MHz, CD_3OD) δ 10.0, 14.4, 23.7, 24.1, 26.6, 30.5, 30.6, 30.8, 33.1, 34.9, 58.8, 70.5;

ESMS calcd for $C_{19}H_{42}NO$ (M+H) 300.3, found 300.4.

Example 92:

(2*S*,3*S*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-octadecanol, 94.



To a solution of aminoalcohol **91** (46 mg, 0.16 mmol) in CH_2Cl_2 (1.6 mL) at room temperature, Boc_2O (42 mg, 0.19 mmol) was added. After stirring for 3.5 h, the solvent was removed *in vacuo* to obtain **94** as a white solid (62 mg, 100% yield).

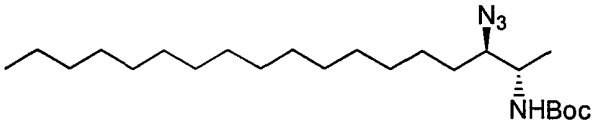
R_f 0.35 (hexane/EtOAc 5:1);

^1H NMR (300 MHz, $CDCl_3$) δ 0.86 (t, *J*= 6.5 Hz, 3H), 1.15 (d, J= 6.8 Hz, 3H), 1.20-1.40 (m, 26H), 1.43 (s, 9H), 1.45-1.60 (m, 2H), 3.40-3.50 (m, 1H), 3.55-3.65 (m, 1H), 4.75 (d, 1H, *J*= 8.8 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 18.3, 22.7, 25.6, 27.4, 28.4, 29.3, 29.6, 29.6, 29.7, 31.9, 34.2, 50.5, 74.9, 156.2.

Example 93:

(2*S*,3*R*)-3-Azido-2-(*N*-*tert*-butoxycarbonylamino)-octadecane, 95.



To a cold (0 °C) solution of alcohol **94** (48 mg, 0.12 mmol) in CH_2Cl_2 (1.25 mL), Et_3N (52 μL, 0.37 mmol) and MsCl (24 μL, 0.31 mmol) were added. After stirring for 2 h, the mixture was quenched with H_2O (10 mL), extracted with CH_2Cl_2 (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude mesylate was dissolved in DMF (0.65 mL) and NaN_3 (40.5 mg, 0.62 mmol) was added. The mixture was stirred

at 120 °C for 3 h and then quenched with H_2O (10 mL), extracted with Et_2O (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 10:1 to 5:1) to obtain azide **95** as a colorless oil (25 mg, 49% yield).

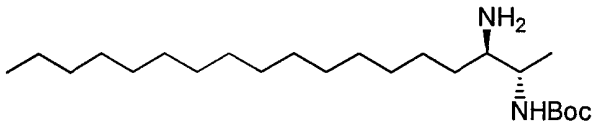
R_f 0.31 (hexane/EtOAc 10:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.6 Hz), 1.06 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.44 (s, 9H), 1.45-1.55 (m, 2H), 3.50-3.58 (m, 1H), 3.70-3.80 (m, 1H), 4.68 (br d, 1H, *J*= 7.7 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 14.4, 22.7, 26.5, 28.2, 28.4, 29.3, 29.4, 29.4, 29.5, 29.6, 29.6, 29.7, 31.4, 31.9, 49.3, 66.5, 155.0.

Example 94:

(2*S*,3*R*)-3-Amino-2-(*N*-*tert*-butoxycarbonylamino)-octadecane, 96.



To a solution of azide **95** (25 mg, 0.06 mmol) in MeOH (1.5 mL) at room temperature, Pd-C (10% wt, 16 mg, 0.015 mmol) was added. The mixture was purged with a stream of dry Ar, and then H_2. The reaction was stirred overnight under a H_2 atmosphere (1 atm). The catalyst was filtered off through a 0.45 μm teflon filter in polypropylene housing, washing the filter with MeOH (15 mL) and the solvent was evaporated *in vacuo* to obtain amine **96** as a white solid (22 mg, 94% yield).

R_f 0.12 (hexane/EtOAc 1:10); ^{1}H NMR (300 MHz, $CDCl_3$) δ 0.86 (t, 3H, *J*= 6.5 Hz), 1.02 (d, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.43 (s, 9H),

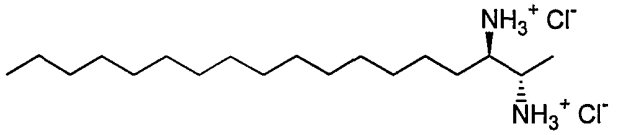
1.45-1.55 (m, 2H), 2.05 (br s, 2H), 2.72-2.82 (m, 1H), 3.60-3.70 (m, 1H), 5.00-5.10 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.7, 26.5, 28.4, 29.3, 29.7, 31.9, 34.8, 49.7, 54.8, 155.4;

ESMS calcd for $C_{23}H_{49}N_2O_2$ (M+H) 385.4, found 385.4.

Example 95:

(2*S*,3*R*)-2,3-Diamino-octadecane dihydrochloride, 97.



To a solution of *N*-Boc derivative **96** (22 mg, 0.057 mmol) in dioxane (0.4 mL), anhydrous HCl solution in dioxane (5.3M, 0.43 mL, 2.29 mmol) was added. After stirring at room temperature for 5 h, the solvent was removed *in vacuo*. The resulting solid was washed with dioxane to obtain dihydrochloride **97** as a white solid (11.5 mg, 56% yield).

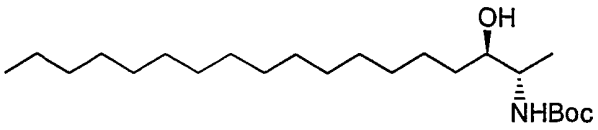
^1H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.4 Hz), 1.20-1.45 (m, 26H), 1.42 (d, 3H, *J*= 7.0 Hz), 1.65-1.80 (m, 2H), 3.42-3.48 (m, 1H), 3.58-3.66 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 14.3, 14.4, 23.7, 26.3, 30.4, 30.5, 30.7, 30.7, 30.8, 33.1, 55.1;

ESMS calcd for $C_{18}H_{41}N_2$ (M-HCl_2) 285.3, found 285.3.

Example 96:

(2*S*,3*R*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-octadecanol, 98.



According of the method of Example 92, from aminoalcohol **1** (82.5 mg, 0.30 mmol) *N*-Boc derivative **98** was obtained as a white solid (110 mg, 95% yield).

R_f 0.35 (hexane/EtOAc 5:1);

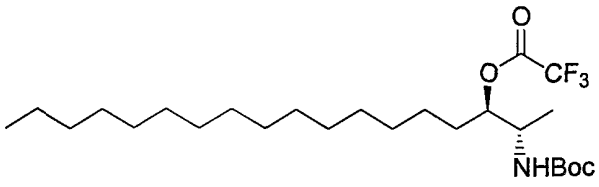
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.9 Hz), 1.09 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 26H), 1.45 (s, 9H), 1.49-1.60 (m, 2H), 2.01-2.09 (m, 1H), 3.55-3.69 (m, 3H), 4.61-4.72 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 14.2, 22.6, 26.0, 28.3, 29.3, 29.6, 31.9, 33.4, 50.5, 74.4, 172.1;

ESMS calcd for $C_{23}H_{47}NO_3Na$ (M+Na) 408.4, found 408.3.

Example 97:

(2*S*,3*R*)-2-(*N*-*tert*-Butoxycarbonylamino)-*O*-(2,2,2-trifluoroacetyl)-3-octadecanol, 99.



To a solution of alcohol **98** (54 mg, 0.14 mmol) in CH_2Cl_2 (6.0 mL) at room temperature, trifluoroacetic anhydride (28 μL, 0.14 mmol), pyridine (22 μL, 0.42 mmmol) and DMAP (1.7 mg, 0.01 mmol) were added. After stirring for 1 h, the reaction was quenched with H_2O (10 mL), extracted with CH_2Cl_2 (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica

(hexane/AcOEt 9:1) to obtain trifluoroacetate **99** as a white solid (17 mg, 25% yield).

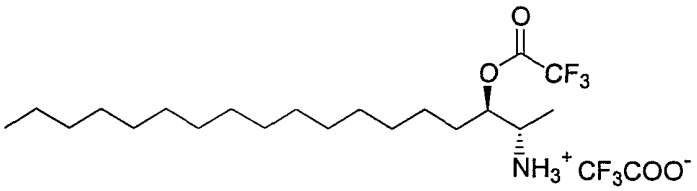
R_f 0.24 (hexane/AcOEt 9:1);

^{1}H NMR (300 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 6.5 Hz), 1.08 (d, 3H, *J*= 6.5 Hz), 1.18-1.36 (m, 26H), 1.41 (s, 9H), 1.52-1.61 (m, 2H), 3.87-3.92 (m, 1H), 4.39-4.44 (m, 1H), 4.98-5.21 (m, 1H);

ESMS calcd for $C_{25}H_{46}F_3NO_4Na$ (M+Na) 504.3, found 504.4.

Example 98:

(2*S*,3*R*)-2-Ammonium-*O*-(2,2,2-trifluoroacetyl)-3-octadecanol trifluoroacetate, 100.



To a solution of *N*-Boc derivative **99** (17 mg, 0.03 mmol) in CH_2Cl_2 (4 mL) at room temperature, trifluoroacetic acid (1.0 mL) was added. After stirring for 1 h, the solvents were removed *in vacuo* to obtain **100** as a white solid (16 mg, 94% yield).

R_f 0.24 (hexane/AcOEt 9:1);

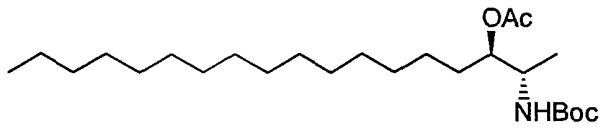
^{1}H NMR (300 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 6.1 Hz), 1.18-1.25 (m, 26H), 1.28 (d, 3H, *J*= 6.5Hz), 1.49-1.56 (m, 1H), 1.64-1.69 (m, 1H), 3.51 (m, 1H), 5.27 (m, 1H), 7.94 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.1, 21.4, 22.7, 25.9, 26.2, 26.3, 26.4, 26.6, 27.4, 28.9, 49.7, 79.0, 101.3, 111.4 161.1;

ESMS calcd for $C_{18}H_{39}NO$ (M-$C_4F_6O_3$) 286.5, found 286.2.

Example 99:

(2*S*,3*R*)-*O*-Acetyl 2-(*N*-*tert*-butoxycarbonylamino)-3-octadecanol, 101.



According of the method of Example 80, from alcohol **98** (20 mg, 0.052 mmol), acetate **101** was obtained as a white solid (18.5 mg, 83% yield).

R_f 0.47 (hexane/EtOAc 5:1);

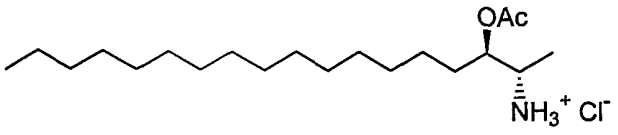
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.08 (d, 3H, *J*= 6.9 Hz), 1.20-1.35 (m, 26H), 1.43 (s, 9H), 1.45-1.55 (m, 2H), 2.06 (s, 3H), 3.79-3.89 (m, 1H), 4.60 (br d, 1H, *J*= 7.7 Hz), 4.85 (dt, 1H, *J*= 7.2, 4.9 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 15.3, 21.1, 22.7, 25.5, 28.4, 29.3, 29.4, 29.5, 29.6, 29.6, 29.7, 30.7, 31.9, 48.3, 79.3, 155.1, 171.0;

ESMS calcd for $C_{25}H_{49}NO_4Na$ (M+Na) 450.4, found 450.4.

Example 100:

(2*S*,3*R*)-*O*-Acetyl-2-amino-3-octadecanol hydrochloride, 102.



According to the method of Example 95, from *N*-Boc derivative **101** (13.7 mg, 0.032 mmol) hydrochloride **102** was obtained as a white solid (9 mg, 77% yield).

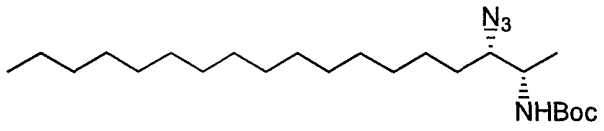
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.6 Hz), 1.20-1.40 (m, 29H), 1.55-1.65 (m, 2H), 2.12 (s, 3H), 3.49 (qd, 1H, *J*= 6.7, 2.4 Hz), 5.07 (ddd, 1H, *J*= 8.7, 5.0, 2.6 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 12.9, 14.5, 20.9, 23.8, 26.5, 30.3, 30.5, 30.5, 30.7, 30.8, 31.3, 33.1, 51.1, 74.3, 172.5;

ESMS calcd for $C_{20}H_{42}NO_2$ (M-Cl) 328.3, found 328.3.

Example 101:

(2*S*,3*S*)-3-Azido-2-(*N*-*tert*-butoxycarbonylamino)-octadecane, 103.



According to the method of Example 93, from alcohol **98** (50 mg, 0.13 mmol), azide **103** was obtained as a colorless oil (39 mg, 73% yield).

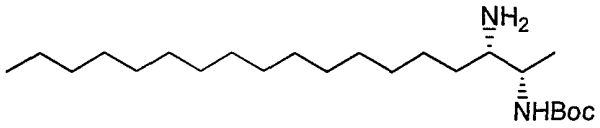
R_f 0.64 (hexane/EtOAc 10:1);

^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.8 Hz), 1.18 (d, 3H, *J*= 6.8 Hz), 1.20-1.39 (m, 26H), 1.43 (s, 9H), 1.53-1.61 (m, 2H), 3.30-3.36 (m, 1H), 3.55-3.97 (m, 1H), 4.50 (d, 1H, *J*= 9.2 Hz);

ESMS calcd for $C_{23}H_{46}N_4O_2Na$ (M+Na) 433.3, found 433.4.

Example 102:

(2*S*,3*S*)-3-Amino-2-(*N*-*tert*-butoxycarbonylamino)-octadecane, 104.



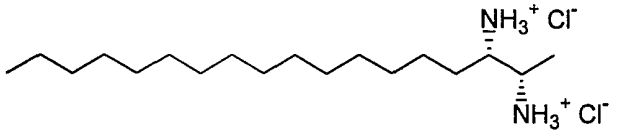
According to the method of Example 94, from azide **103** (15 mg, 0.03 mmol), amine **104** was obtained as a colorless oil (13 mg, 92% yield).

^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.8 Hz), 1.10 (d, 3H, *J*= 6.8 Hz), 1.21-1.40 (m, 26H), 1.43 (s, 9H), 1.45-1.47 (m, 2H), 2.70-2.75 (m, 1H), 3.60-3.55 (m, 1H), 4.90 (d, 1H, *J*= 6.8 Hz);

ESMS calcd for $C_{23}H_{49}N_2O_2$ (M+H) 385.4, found 385.4.

Example 103:

(2*S*,3*S*)-2,3-Diamino-octadecane dihydrochloride, 105.



According to the method of Example 95, from *N*-Boc derivative **104** (13 mg, 0.03 mmol), dihydrochloride **105** was obtained as a white solid (11 mg, 75% yield).

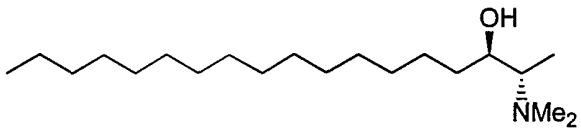
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.8 Hz), 1.35 (d, 3H, *J*= 6.8 Hz), 1.25-1.40 (m, 26H), 1.56-1.72 (m, 2H), 3.49-3.56 (m, 1H), 3.70-3.74 (m, 1H);

^{13}C NMR (75 MHz, CD_3OD) δ 13.1, 14.4, 22.7, 26.5, 27.8, 30.5, 30.8, 33.1, 54.1;

ESMS calcd for $C_{18}H_{41}N_2$ ($M-HCl_2$) 285.3, found 285.4.

Example 104:

(2*S*,3*R*)-2-(*N*,*N*-Dimethylamino)-3-octadecanol, 106.



A mixture of aminoalcohol **1** (100 mg, 0.35 mmol), formaldehyde (37% w/w, aq. 142 mg, 1.75 mmol), $NaB(OAc)_3H$ (370 mg, 1.75 mmol) and $(CH_2Cl)_2$ (2 mL) was stirred at room temperature for 3 h. The reaction was quenched by the addition of $NaHCO_3$ (15 mL, sat. aq.) and extracted with EtOAc (3x25 mL). The combined extracts were dried over Na_2SO_4 and concentrated *in vacuo* to give **106** as a white solid (83 mg, 75% yield).

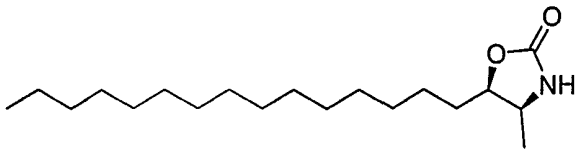
^1H NMR (500 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 7.1 Hz), 0.92 (d, 3H, *J*= 6.7 Hz), 1.15-1.25 (m, 26H), 1.30-1.40 (m, 2H), 2.19 (s, 6H), 2.30-2.35 (m, 1H), 3.60-3.65 (m, 1H);

^{13}C NMR (125 MHz, CD_3OD) δ 8.7, 14.9, 24.2, 27.7, 30.9, 31.2, 33.5, 36.8, 42.2, 65.0, 73.3;

ESMS calcd for $C_{20}H_{44}NO$ (M+H) 314.3, found 314.4.

Example 105:

(4*S*,5*R*)-4-Methyl-5-(*n*-pentadecyl)-1,3-oxazolidinone, 107.



A mixture of aminoalcohol **1** (150 mg, 0.53 mmol) and carbonyl diimidazole (94 mg, 0.58 mmol) in THF (10 mL) was stirred at 60 °C for 3 h. Then, the solvent was removed *in vacuo* and the residue was dissolved in CH_2Cl_2 (40 mL), washed successively with HCl (2N, 40 mL), H_2O (40 mL) and brine (40 mL), dried over Na_2SO_4 and concentrated *in vacuo* to give oxazolidinone **107** as a white solid (160 mg, 98% yield).

R_f 0.21 (hexane/EtOAc 2:1);

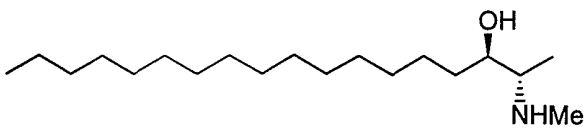
^{1}H NMR (300 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 7.0 Hz), 1.02 (d, 3H, *J*= 6.5 Hz), 1.15-1.30 (m, 26H), 1.40-1.55 (m, 2H), 3.81 (quint, 1H, *J*= 6.5 Hz), 4.44-4.52 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 20.7, 22.7, 24.8, 29.3, 29.4, 29.4, 29.5, 29.7, 31.9, 34.1, 53.5, 84.2, 158.7;

ESMS calcd for $C_{19}H_{37}NO_2Na$ (M+Na) 334.3, found 334.3.

Example 106:

(2*S*,3*R*)-2-(*N*-Methylamino)-3-octadecanol, 108.



To a cold (0 °C) solution of **107** (160 mg, 0.52 mmol) in THF (20 mL), $LiAlH_4$ (1M in THF, 1.04 mL, 1.04 mmol), was added dropwise. The mixture was stirred overnight at room temperature. A further portion of $LiAlH_4$ (1.04 mL, 1.04 mmol) was added and the reaction left for 2 more days. The reaction was quenched with H_2O containing a few drops of

NH_4OH (20 mL) and extracted with EtOAc (3x20 mL). The combined extracts were successively washed with H_2O (30 mL) and brine (30 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (50% to 75% CH_2Cl_2/hexane to 100% CH_2Cl_2 to 10% MeOH/$CHCl_3$ and a few drops of NH_4OH) to give **108** as a white solid (35 mg, 23% yield).

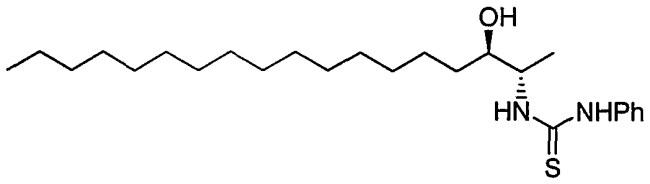
^1H NMR (500 MHz, CD_3OD) δ 0.80 (t, 3H, *J*= 7.1 Hz), 0.92 (d, 3H, *J*= 6.7 Hz), 1.15-1.25 (m, 26H), 1.30-1.45 (m, 2H), 2.19 (s, 3H), 2.50-2.55 (m, 1H), 3.55-3.60 (m, 1H);

^{13}C NMR (125 MHz, CD_3OD) δ 13.3, 14.9, 24.2, 27.8, 30.9, 31.2, 33.5, 34.7, 36.8, 42.3, 60.5, 73.1;

ESMS calcd for $C_{19}H_{42}NO$ (M+H) 300.3, found 300.3.

Example 107:

(2*S*,3*R*)-2-Amino-*N*-(phenylthiocarbamoyl)-3-octadecanol, 109.



To a solution of aminoalcohol **1** (197 mg, 0.69 mmol) in THF (3.5 mL) at room temperature, PhNCS (0.165 mL, 1.38 mmol) was added. The reaction was stirred for 1 h, and then the solvents were evaporated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 5:1 to 2:1) to give phenylthiourea **109** as a white solid (246 mg, 85% yield).

R_f 0.29 (hexane/EtOAc 2:1);

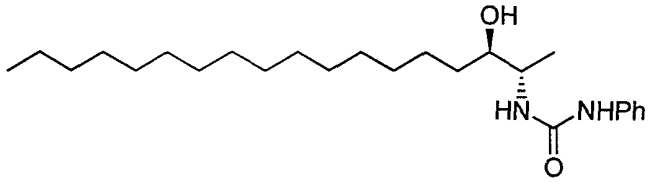
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.85 (t, 3H, *J*= 6.7 Hz), 1.08 (d, 3H, *J*= 6.9 Hz), 1.20-1.30 (m, 26H), 1.35-1.45 (m, 2H), 2.20 (br s, 1H), 3.72-3.82 (m, 1H) 4.45-4.60 (m, 1H), 6.58 (d, 1H, *J*= 8.6 Hz), 7.18-7.38 (m, 5H), 8.39 (br s, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.9, 14.0, 22.6, 25.8, 29.2, 29.4, 29.5, 29.5, 29.6, 31.8, 33.7, 54.5, 73.5, 124.4, 126.6, 129.9, 136.4, 179.0;

ESMS calcd for $C_{25}H_{43}N_2OS$ (M-H) 419.3, found 419.2.

Example 108:

(2*S*,3*R*)-2-Amino-*N*-(phenylcarbamoyl)-3-octadecanol, 110.



According to the method of Example 107, from aminoalcohol **1** (23 mg, 0.08 mmol) and PhNCO (18 μL, 0.16 mmol), phenylurea **110** was obtained as a white solid (15 mg, 46% yield).

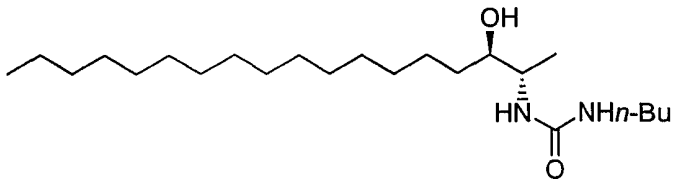
R_f 0.50 (hexane/EtOAc 5:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.7 Hz), 1.11 (d, 3H, *J*= 6.9 Hz), 1.20-1.30 (m, 26H), 1.35-1.45 (m, 2H), 2.17 (br s, 1H), 3.63-3.73 (m, 1H) 3.90-4.00 (m, 1H), 5.02 (d, 1H, *J*= 7.2 Hz), 6.58 (br s, 1H), 7.05-7.12 (m, 1H), 7.25-7.34 (m, 4H);

ESMS calcd for $C_{25}H_{45}N_2O_2$ (M+H) 405.3, found 405.4.

Example 109:

(2*S*,3*R*)-2-Amino-*N*-(*n*-butylcarbamoyl)-3-octadecanol, 111.



According to the method of Example 107, from aminoalcohol **1** (27 mg, 0.09 mmol) and *n*-BuNCO (21 μL, 0.19 mmol), *n*-butylurea **111** was obtained as a white solid (13 mg, 36% yield).

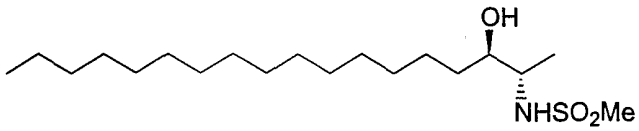
R_f 0.25 (hexane/EtOAc 2:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.9 Hz), 0.92 (t, 3H, *J*= 7.2 Hz), 1.08 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 28H), 1.40-1.55 (m, 4H), 2.91 (br s, 1H), 3.14 (q, 2H, *J*= 6.5 Hz), 3.61 (br s, 1H), 3.78-3.88 (m, 1H), 4.56-4.66 (m, 2H);

ESMS calcd for $C_{23}H_{49}N_2O_2$ (M+H) 385.4, found 385.4.

Example 110:

(2*S*,3*R*)-2-(Methanesulfonamide)-3-octadecanol, 112.



To a solution of aminoalcohol **1** (40 mg, 0.14 mmol) in CH_2Cl_2 (5.0 mL) at room temperature, $ClSO_2Me$ (11 μL, 0.14 mmol) was added. After stirring for 1 h, the reaction was quenched with H_2O (10 mL), extracted with CH_2Cl_2 (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 4:1) to obtain sulfonamide **112** as a white solid (49 mg, 96% yield).

R_f 0.13 (hexane/EtOAc 4:1);

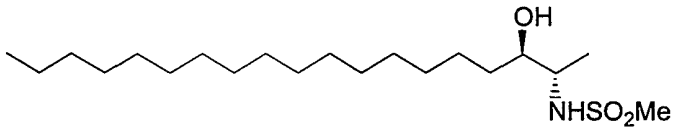
^{1}H NMR (300 MHz, CD_3OD) δ 0.85 (t, 3H, *J*= 6.8 Hz), 1.19 (t, 3H *J*= 6.8 Hz), 1.20-1.40 (m, 26H), 1.47-1.53 (m, 2H), 1.86 (d, 1H, *J*= 5.1 Hz), 3.00 (s, 3H), 3.53 (t, 1H, *J*= 6.1 Hz), 3.66-3.72 (m, 1H), 4.66 (d, 1H, *J*= 8.1 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.0, 14.5, 16.4, 23.2, 26.9, 27.2, 30.6, 30.7, 30.8, 33.1, 34.2, 41.6, 55.3, 71.5;

ESMS calcd for $C_{18}H_{38}NO$ (M-SO_2Me) 286.2, found 286.5.

Example 111:

(2*S*,3*R*)-2-(Methanesulfonamide)-3-nonadecanol, 113



According to the method of Example 110, from aminoalcohol **2** (25 mg, 0.08 mmol), sulfonamide **113** was obtained as a white solid (29 mg, 94% yield).

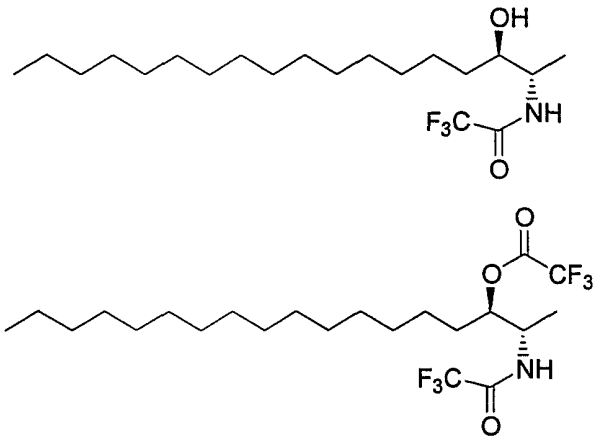
^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.4 Hz), 1.17 (d, 3H, *J*= 6.4 Hz), 1.20-1.40 (m, 28H), 1.46-1.53 (m, 2H), 1.98-2.05 (m, 1H), 2.97-3.03 (m, 1H), 3.47-3.58 (m, 1H), 3.68-3.74 (m, 1H), 4.77-4.83 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.3, 15.5, 22.9, 26.2, 29.5, 29.7, 29.8, 29.9, 32.1, 33.4, 42.0, 54.0, 74.6;

ESMS calcd for $C_{19}H_{40}NO$ (M-SO_2Me) 300.3, found 300.3.

Example 112:

(2*S*,3*R*)-2-(2,2,2-Trifluoroacetylamino)-3-octadecanol, 114, and (2*S*,3*R*)-2-(2,2,2-trifluoroacetylamino)-*O*-(2,2,2-trifluoroacetyl)-octadecanol, 115.



To a solution of aminoalcohol **1** (27 mg, 0.09 mmol) in CH_2Cl_2 (5.0 mL) at room temperature, trifluoroacetic anhydride (12.8 μL, 0.09 mmol) was added. After stirring for 1 h, the solvents were removed *in vacuo*. The crude was purified by column chromatography on silica (hexane/CH_2Cl_2 1:1) to obtain **114** (9 mg, 25% yield) R_f 0.34 (hexane/CH_2Cl_2 1:1) and **115** (11 mg, 24% yield) R_f 0.52 (hexane/CH_2Cl_2 1:1) as white solids.

114: ^{1}H NMR (300 MHz, CD_3OD) δ 0.85 (t, 3H, *J*= 6.9 Hz), 1.05 (d, 3H, *J*= 7.0 Hz), 1.19-1.38 (m, 26H), 1.45-1.53 (m, 2H), 3.60-3.66 (m, 1H), 3.93-3.98 (m, 1H), 6.65 (d, 1H, *J*= 7.5Hz);

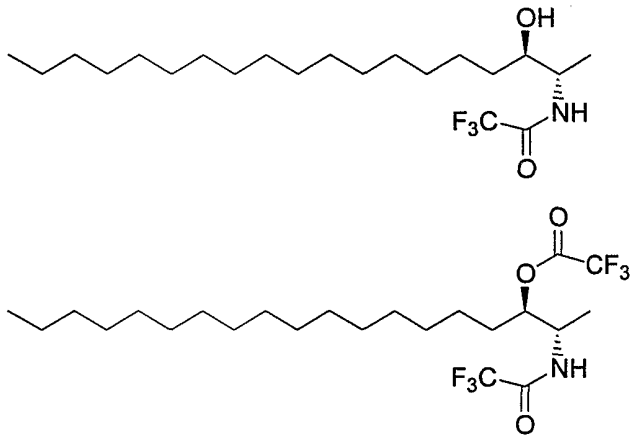
^{13}C NMR (75 MHz, $CDCl_3$) δ 12.9, 14.3, 15.4, 22.9, 25.9, 29.5, 29.7, 29.8, 31,8, 32.1, 34.2, 49.6, 73.2, 76.8, 114.4, 118.2, 121.8, 151.4, 156.9;

ESMS calcd for $C_{20}H_{38}F_3NO_2Na$ (M+Na) 404.3, found 404.8.

115: ^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 7.6 Hz), 1.20-1.39 (m, 26H), 2.46-2.55 (m, 2H), 4.01-4.43 (m, 1H), 4.95-5.24 (m, 1H), 6.00-6.34 (m, 1H).

Example 113:

(2*S*,3*R*)-2-(2,2,2-Trifluoroacetylamino)-3-nonadecanol, 116, and (2*S*,3*R*)-2-(2,2,2-trifluoroacetylamino)-*O*-(2,2,2-trifluoroacetyl)-nonadecanol, 117.



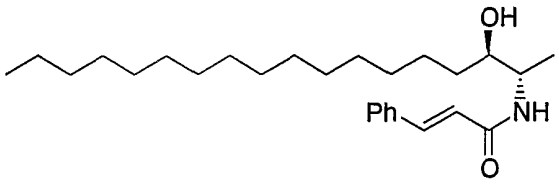
According to the method of Example 112, from aminoalcohol **2** (22 mg, 0.07 mmol), **116** (6 mg, 22% yield) and **117** (8 mg, 23% yield) were obtained as white solids.

116: ^{1}H NMR (300 MHz, CD_3OD) δ 0.85 (t, 3H, *J*= 6.8 Hz), 1.01 (d, 3H, *J*= 6.8Hz), 1.23-1.41 (m, 28H), 1.45-1.53 (m, 2H), 3.65-3.73 (m, 1H), 3.96-4.06 (m, 1H), 6.68-6.73 (m, 1H).

117: ^{1}H NMR (300 MHz, CD_3OD) δ 0.88 (t, 3H, *J*= 7.6 Hz,), 1.25-1.38 (m, 26H), 2.47-2.60 (m, 2H), 4.00-4.40 (m, 1H), 4.97-5.28 (m, 1H), 6.01-6.35 (m, 1H).

Example 114:

(2*S*,3*R*)-2-Amino-*N*-(*trans*-cinnamoyl)-3-octadecanol, 118.



To a solution of aminoalcohol **1** (30 mg, 0.10 mmol) in CH_2Cl_2 (3.0 mL) at room temperature, pyridine (58 mL, 0.11 mmol) and cinnamoyl chloride (16.6 mg, 0.36 mmol) were added. After stirring for 1 h, the reaction was quenched with H_2O (10 mL), extracted with CH_2Cl_2 (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 4:1) to obtain **118** as a white solid (32 mg, 74% yield).

R_f 0.31(hexane/EtOAc 2:1);

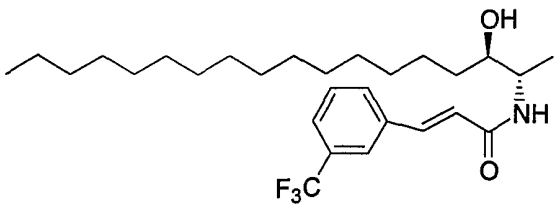
^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.16 (d, 3H, *J*= 6.9 Hz), 1.21-1.40 (m, 26H), 1.33-1.40 (m, 2H), 2.28-2.35 (m, 1H), 3.64-3.71 (m, 1H), 4.06-4.18 (m, 1H), 5.92 (d, 1H, *J*= 15.6 Hz), 6.40 (d, 1H, *J*= 15.6 Hz), 7.31-7.36 (m, 3H), 7.41-7.50 (m, 2H), 7.62 (d, 1H, *J*= 15.6 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.9, 25.3, 26.2, 29.5, 29.9, 33.8, 49.9, 74.3, 124.2, 126.8, 129.8, 130.9, 136.1, 165.1;

ESMS calcd for $C_{27}H_{45}NO_2Na$ (M+Na) 438.3, found 438.3.

Example 115:

(2*S*,3*R*)-2-Amino-*N*-[*trans*-3-(trifluoromethyl)-cinnamoyl]-3-octadecanol, 119.



According to the method of Example 114, from aminoalcohol **1** (30 mg, 0.10 mmol) and 3-(trifluoromethyl)-cinnamoyl chloride (24.6 mg, 0.10 mmol), amide **119** was obtained as a white solid (28 mg, 56% yield).

R_f 0.30 (hexane/EtOAc 2:1);

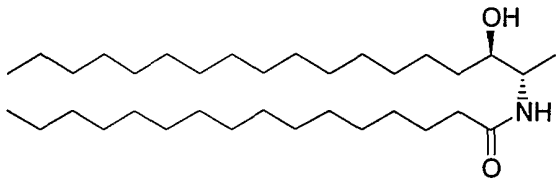
^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.9 Hz), 1.16 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m, 26H), 1.35-1.41 (m, 2H), 3.68-3.74 (m, 1H), 3.98-4.20 (m, 1H), 6.06 (d, 1H, *J*= 9.6 Hz), 6.45 (d, *J*= 6.9 Hz, 1H), 7.48-7.78 (m, 4H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.9, 26.2, 29.6, 29.8, 29.9, 32.1, 33.9, 49.9, 74.4, 122.8, 124.1, 124.2, 126.3, 129.5, 131.3, 135.8, 139.7, 165.2;

ESMS calcd for $C_{28}H_{44}F_3NO_2Na$ (M+Na) 506.3, found 506.4.

Example 116:

(2*S*,3*R*)-2-Amino-*N*-(palmitoyl)-3-octadecanol, 120.



To a solution of aminoalcohol **1** (30 mg, 0.10 mmol) in CH_2Cl_2 (3.0 mL) at room temperature, palmitic acid (28 mg, 0.11 mmol), EDC (50.2 mg, 0.26 mmol), DIPEA (39 μL, 0.15 mmol) and DMAP (1.2 mg, 0.01 mmol) were added. After stirring for 2 h, the reaction was quenched with H_2O (10 mL), extracted with CH_2Cl_2 (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 4:1) to obtain **120** as a white solid (48 mg, 87% yield).

R_f 0.21 (hexane/EtOAc 4:1);

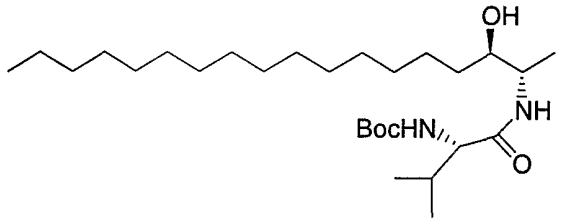
^{1}H NMR (300 MHz, CD_3OD) δ 0.85-0.94 (m, 6H), 1.08 (d, 3H, *J*= 7.1 Hz), 1.20-1.40 (m, 52H), 1.58-1.65 (m, 2H) 2.16 (t, 2H, *J*= 7.1Hz), 2.29-2.33 (m, 1H), 3.58-3.64 (m, 1H), 3.93-4.13 (m, 1H), 5.72 (d, 1H, *J*= 7.1 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 15.2, 22.7, 25.8, 25.9, 29.2, 29.3, 29.5, 29.6, 29.7, 31.9, 33.5, 36.9, 49.4, 65.8, 74.4, 173.1;

ESMS calcd for $C_{34}H_{69}NO_2Na$ (M+Na) 546.5, found 546.8.

Example 117:

(2*S*,3*R*)-2-[2-(*tert*-Butoxycarbonylamino)-3-methylbutyramide)]-3-octadecanol, 121.



To a solution of aminoalcohol **1** (30 mg, 0.10 mmol) in CH_2Cl_2 (3.0 mL) at room temperature, *N*-Boc-valine (23 mg, 0.11 mmol), EDC (50.2 mg, 0.26 mmol), DIPEA (39 μL, 0.15 mmol) and DMAP (1.2 mg, 0.01 mmol) were added. After stirring for 2 h, the reaction was quenched with H_2O (10 mL), extracted with CH_2Cl_2 (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 4:1) to obtain **121** as a white solid (48 mg, 87% yield).

R_f 0.13 (hexane/EtOAc 4:1);

^{1}H NMR (300 MHz, CD_3OD) δ 0.86 (t, 3H, *J*= 6.9 Hz), 0.91 (d, 3H, *J*= 6.9 Hz), 0.96 (d, 3H, *J*= 6.9 Hz), 1.08 (d, 3H, *J*= 6.9 Hz), 1.20-1.40 (m,

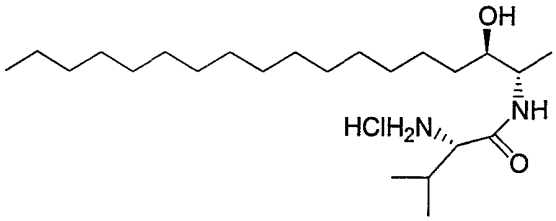
26H), 1.38-1.46 (m, 11H), 1.99-2.23 (m, 1H), 2.33-2.78 (m, 1H), 3.64 (m, 1H), 3.83 (t, 1H, *J*= 6.3 Hz), 3.98 (m, 1H), 5.06 (d, 1H, *J*= 6.8 Hz), 6.29 (d, 1H, *J*= 7.8 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 13.7, 14.1, 17.8, 19.3, 22.7, 26.0, 28.3, 29.3, 29.5, 29.7, 30.6, 31.9, 33.5, 49.6, 60.4, 73.8, 157.4, 171.3;

ESMS calcd for $C_{28}H_{57}N_2O_4$ (M+Ha) 485.4, found 485.7.

Example 118:

(2*S*,3*R*)-2-[2-Amino-3-methylbutyramide)]-3-octadecanol hydrochloride, 122.



According to the method of Example 95, from *N*-Boc derivative **121** (24 mg, 0.05 mmol), hydrochloride **122** was obtained as a white solid (15 mg, 75% yield).

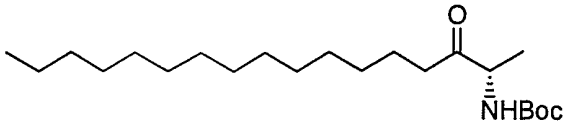
^{1}H NMR (300 MHz, CD_3OD) δ 0.87 (t, 3H, *J*= 6.8 Hz), 1.07-1.11 (m, 6H), 1.13 (d, 3H, *J*= 6.8 Hz), 1.21-1.40 (m, 26H), 1.41-1.52 (m, 2H), 2.09-2.11 (m, 1H), 3.40-3.47 (m, 1H), 3.66-3.77 (m, 1H), 3.87-3.93 (m, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 12.7, 13.1, 16.7, 17.8, 18.3, 21.6, 25.2, 27.2, 28.3, 28.7, 29.6, 30.9, 32.3, 49.6, 66.0, 72.5, 166.7;

ESMS calcd for $C_{23}H_{49}N_2O_2$ (M-Cl) 385.3, found 385.3.

Example 119:

(2*S*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-heptadecanone, 123.



To a solution of aminoalcohol **37** (82 mg, 0.274 mmol) in dioxane (0.7 mL) and H_2O (0.4 mL) at room temperature, NaOH (1M, aq., 0.3 mL) was added followed by Boc_2O (66 mg, 0.301 mmol). After stirring for 2 h, the reaction was diluted with EtOAc (10 mL) and $KHSO_4$ (10% aq., 10 mL) was added. The layers were separated and the aqueous layer extracted with EtOAc (3x10 mL). The organic layers were dried over Na_2SO_4 and concentrated *in vacuo* to obtain the crude *N*-Boc derivative as a white solid. To a cold (-78 °C) solution of $(COCl)_2$ (2M in CH_2Cl_2, 0.22 mL, 0.447 mmol) in CH_2Cl_2 (4.5 mL), DMSO (0.063 mL, 0.894 mmol) was added dropwise. After stirring at -78 °C for 15 min, a solution of the *N*-Boc derivative (69 mg, 0.179 mmol) in CH_2Cl_2 (2 mL) was added dropwise. The mixture was stirred at -78 °C for 1 h, and then Et_3N (0.187 mL, 1.34 mmol) was added. The reaction was warmed up to 0 °C and stirred for 15 min, followed by the addition of NH_4Cl (15 mL, sat. aq.). The crude was extracted with CH_2Cl_2 (3x15 mL), washed successively with $NaHCO_3$ (30 mL, sat. aq.) and brine (30 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 5:1) to obtain ketone **123** as a white solid (40 mg, 56% yield) together with unreacted starting material (30 mg). R_f 0.42 (hexane/EtOAc 5:1);

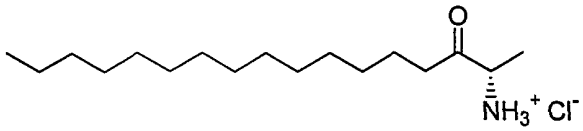
^1H NMR (300 MHz, $CDCl_3$) δ 0.85 (t, 3H, *J*= 6.4 Hz), 1.20-1.37 (m, 25H), 1.42 (s, 9H), 1.54-1.62 (m, 2H), 2.38-2.56 (m, 2H), 4.29 (quint, 1H, *J*= 6.5 Hz), 5.28 (br d, 1H, *J*= 5.2 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.0, 17.9, 22.6, 23.5, 28.3, 29.2, 29.3, 29.4, 29.5, 29.6, 31.9, 39.1, 55.0, 209.7;

ESMS calcd for $C_{22}H_{43}NO_3Na$ (M+Na) 392.3, found 392.3.

Example 120:

(2*S*)-2-Amino-3-heptadecanone hydrochloride, 124.



According to the method of Example 95, from ketone **123** (33.5 mg, 0.091 mmol), hydrochloride **124** was obtained as a white solid (22 mg, 79% yield).

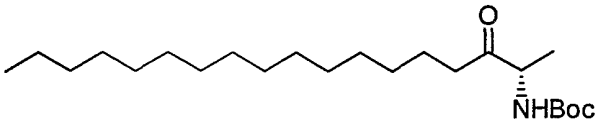
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.9 Hz), 1.20-1.35 (m, 22H), 1.51 (d, 3H, *J*= 7.4 Hz), 1.55-1.65 (m, 2H), 2.50-2.72 (m, 2H), 4.13 (q, 1H, *J*= 7.4 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.4, 15.7, 23.7, 24.3, 30.1, 30.5, 30.5, 30.6, 30.7, 30.8, 33.1, 39.2, 55.8, 207.4;

ESMS calcd for $C_{17}H_{36}NO$ (M-Cl) 270.3, found 270.2.

Example 121:

(2*S*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-octadecanone, 125.



According to the method of Example 119, from aminoalcohol **1** (53 mg, 0.186 mmol), ketone **125** was obtained as a white solid (27 mg, 38% yield), together with unreacted starting alcohol (24 mg). R_f 0.42 (hexane/EtOAc 5:1);

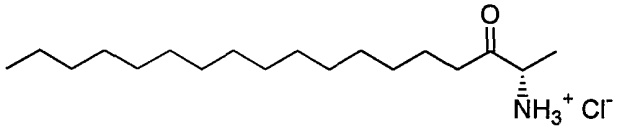
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.4 Hz), 1.20-1.37 (m, 27H), 1.43 (s, 9H), 1.54-1.62 (m, 2H), 2.38-2.56 (m, 2H), 4.30 (quint, 1H, *J*= 6.8 Hz), 5.27 (br s, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 17.9, 22.7, 23.6, 28.3, 29.2, 29.3, 29.4, 29.6, 29.7, 31.9, 39.2, 55.0, 209.7;

ESMS calcd for $C_{23}H_{45}NO_3Na$ (M+Na) 406.3, found 406.3.

Example 122:

(2*S*)-2-Amino-3-octadecanone hydrochloride, 126.



According to the method of Example 95, from ketone **125** (24 mg, 0.063 mmol), hydrochloride **126** was obtained as a white solid (17 mg, 85% yield).

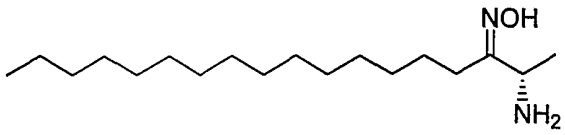
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.9 Hz), 1.20-1.35 (m, 24H), 1.51 (d, 3H, *J*= 7.4 Hz), 1.55-1.65 (m, 2H), 2.50-2.72 (m, 2H), 4.13 (q, 1H, *J*= 7.4 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.4, 15.7, 23.7, 24.3, 30.1, 30.5, 30.5, 30.6, 30.8, 33.1, 39.2, 55.8, 207.4;

ESMS calcd for $C_{18}H_{38}NO$ (M-Cl) 284.3, found 284.3.

Example 123:

(2*S*)-2-Amino-3-octadecanone oxime, 127.



To a solution of ketone **126** (108 mg, 0.34 mmol) in 2.5 mL of EtOH, $NH_2OH \cdot HCl$ (117 mg, 1.69 mmol) and AcONa (249 mg, 3.04 mmol) were added. The mixture was stirred at 80 °C for 8 h, and then the solvent was evaporated *in vacuo*. The residue was suspended in H_2O, filtered and washed with H_2O. The collected solid was recrystallised from EtOAc to obtain oxime **127** as a white solid (70 mg, 69% yield).

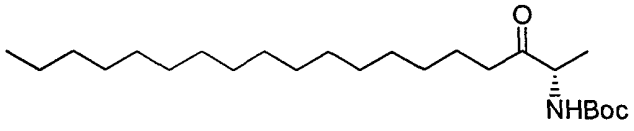
^1H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.20-1.35 (m, 27H), 1.55-1.65 (m, 2H), 2.18 (ddd, 1H, *J*= 12.9, 10.1, 6.0 Hz), 2.47 (ddd, 1H, *J*= 12.9, 9.6, 6.4 Hz), 3.72 (q, 1H, *J*= 6.7 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.5, 18.3, 23.7, 24.0, 26.6, 26.7, 30.4, 30.5, 30.7, 30.8, 31.0, 33.1, 50.2, 158.0;

ESMS calcd for $C_{18}H_{39}N_2O$ (M+H) 299.3, found 299.3.

Example 124:

(2*S*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-nonadecanone, 128.



According to the method of Example 119, from aminoalcohol **2** (59 mg, 0.197 mmol), ketone **128** was obtained as a white solid (44 mg, 56% yield).

R_f 0.42 (hexane/EtOAc 5:1);

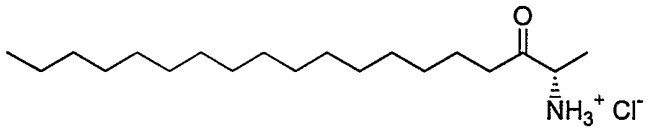
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.85 (t, 3H, *J*= 6.4 Hz), 1.20-1.37 (m, 29H), 1.42 (s, 9H), 1.54-1.62 (m, 2H), 2.38-2.56 (m, 2H), 4.28 (quint, 1H, *J*= 6.7 Hz), 5.29 (br d, 1H, *J*= 6.2 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.0, 17.8, 22.6, 23.5, 28.3, 29.2, 29.3, 29.4, 29.5, 29.6, 31.9, 39.1, 55.0, 209.7;

ESMS calcd for $C_{24}H_{47}NO_3Na$ (M+Na) 420.4, found 420.2.

Example 125:

(2*S*)-2-Amino-3-nonadecanone hydrochloride, 129.



According to the method of Example 95, from ketone **128** (33 mg, 0.083 mmol), hydrochloride **129** was obtained as a white solid (25 mg, 90% yield).

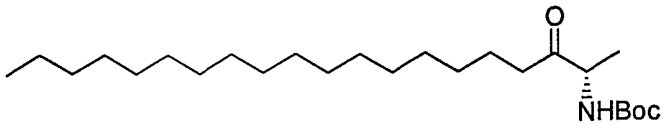
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.9 Hz), 1.20-1.35 (m, 26H), 1.51 (d, 3H, *J*= 7.4 Hz), 1.55-1.65 (m, 2H), 2.50-2.72 (m, 2H), 4.13 (q, 1H, *J*= 7.4 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.4, 15.7, 23.7, 24.3, 30.1, 30.5, 30.5, 30.6, 30.8, 33.1, 39.2, 55.8, 207.4;

ESMS calcd for $C_{19}H_{40}NO$ (M-Cl) 298.3, found 298.3.

Example 126:

(2*S*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-eicosadecanone, 130.



According to the method of Example 119, from aminoalcohol **3** (81 mg, 0.258 mmol), ketone **130** was obtained as a white solid (75 mg, 70% yield).

R_f 0.42 (hexane/EtOAc 5:1);

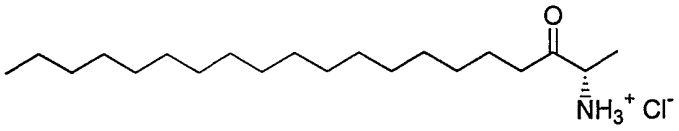
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.86 (t, 3H, *J*= 6.2 Hz), 1.20-1.37 (m, 31H), 1.42 (s, 9H), 1.54-1.62 (m, 2H), 2.38-2.56 (m, 2H), 4.29 (quint, 1H, *J*= 6.5 Hz), 5.29 (br d, 1H, *J*= 5.4 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.0, 17.8, 22.6, 23.5, 28.3, 29.2, 29.3, 29.4, 29.5, 29.6, 31.9, 39.1, 55.0, 209.6;

ESMS calcd for $C_{25}H_{49}NO_3Na$ (M+Na) 434.4, found 434.3.

Example 127:

(2*S*)-2-Amino-3-eicosadecanone hydrochloride, 131.



According to the method of Example 95, from ketone **130** (47 mg, 0.114 mmol), hydrochloride **131** was obtained as a white solid (30.5 mg, 77% yield).

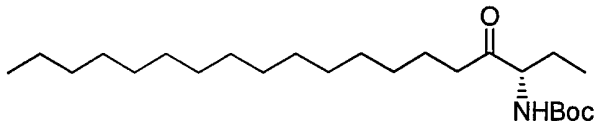
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.9 Hz), 1.20-1.35 (m, 28H), 1.50 (d, 3H, *J*= 7.2 Hz), 1.55-1.65 (m, 2H), 2.50-2.72 (m, 2H), 4.13 (q, 1H, *J*= 7.2 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.4, 15.7, 23.7, 24.3, 30.1, 30.5, 30.5, 30.6, 30.7, 30.8, 33.1, 39.2, 55.8, 207.4;

ESMS calcd for $C_{20}H_{42}NO$ (M-Cl) 312.3, found 312.3.

Example 128:

(3*S*)-3-(*N*-*tert*-Butoxycarbonylamino)-4-nonadecanone, 132.



According to the method of Example 119, from aminoalcohol **57** (82 mg, 0.274 mmol), ketone **132** was obtained as a white solid (54 mg, 50% yield).

R_f 0.42 (hexane/EtOAc 5:1);

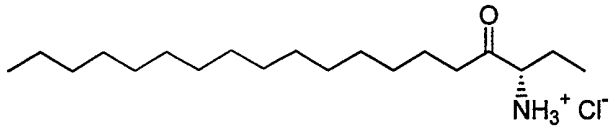
^1H NMR (300 MHz, $CDCl_3$) δ 0.86 (t, 6H, *J*= 7.0 Hz), 1.20-1.35 (m, 24H), 1.43 (s, 9H), 1.55-1.65 (m, 3H), 1.84-1.96 (m, 1H), 2.38-2.56 (m, 2H), 4.28 (q, 1H, *J*= 5.5 Hz), 5.24 (br d, 1H, *J*= 6.9 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 9.2, 14.0, 22.6, 23.5, 24.8, 28.3, 29.2, 29.3, 29.4, 29.6, 29.6, 31.9, 39.8, 60.1, 209.4;

ESMS calcd for $C_{24}H_{47}NO_3Na$ (M+Na) 420.4, found 420.3.

Example 129:

(3*S*)-3-Amino-4-nonadecanone hydrochloride, 133.



According to the method of Example 95, from ketone **132** (36.5 mg, 0.092 mmol), hydrochloride **133** was obtained as a white solid (29 mg, 95% yield).

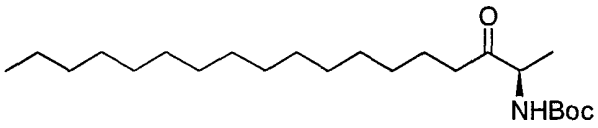
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.7 Hz), 1.00 (t, 3H, *J*= 7.5 Hz), 1.20-1.35 (m, 24H), 1.55-1.65 (m, 2H), 1.82-1.96 (m, 1H), 2.00-2.12 (m, 1H), 2.50-2.72 (m, 2H), 4.11 (dd, 1H, *J*= 7.2, 4.5 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 9.3, 14.5, 23.8, 23.9, 24.3, 30.1, 30.5, 30.5, 30.6, 30.7, 30.8, 33.1, 39.8, 61.0, 207.1;

ESMS calcd for $C_{19}H_{40}NO$ (M-Cl) 298.3, found 298.3.

Example 130:

(2*R*)-2-(*N*-*tert*-Butoxycarbonylamino)-3-octadecanone, 134.



According to the method of Example 119, from aminoalcohol **81** (53 mg, 0.186 mmol), ketone **134** was obtained as a white solid (40 mg, 56% yield).

R_f 0.42 (hexane/EtOAc 5:1);

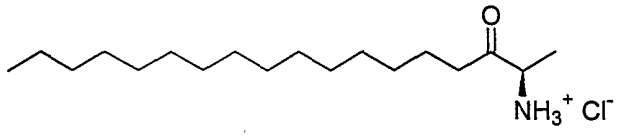
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.4 Hz), 1.20-1.37 (m, 27H), 1.43 (s, 9H), 1.54-1.62 (m, 2H), 2.38-2.56 (m, 2H), 4.30 (quint, 1H, *J*= 6.8 Hz), 5.27 (br s, 1H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 17.9, 22.7, 23.6, 28.3, 29.2, 29.3, 29.4, 29.6, 29.7, 31.9, 39.2, 55.0, 209.7;

ESMS calcd for $C_{23}H_{45}NO_3Na$ (M+Na) 406.3, found 406.2.

Example 131:

(2*R*)-2-Amino-3-octadecanone hydrochloride, 135.



According to the method of Example 95, from ketone **134** (30 mg, 0.078 mmol), hydrochloride **135** was obtained as a white solid (24 mg, 96% yield).

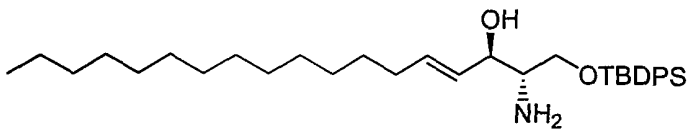
^{1}H NMR (300 MHz, CD_3OD) δ 0.89 (t, 3H, *J*= 6.9 Hz), 1.20-1.35 (m, 24H), 1.51 (d, 3H, *J*= 7.4 Hz), 1.55-1.65 (m, 2H), 2.50-2.72 (m, 2H), 4.13 (q, 1H, *J*= 7.4 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.4, 15.7, 23.7, 24.3, 30.1, 30.5, 30.5, 30.6, 30.8, 33.1, 39.2, 55.8, 207.4;

ESMS calcd for $C_{18}H_{38}NO$ (M-Cl) 284.3, found 284.2.

Example 132:

(2*S*,3*R*)-2-Amino-1-(*tert*-butyldiphenylsilyloxy)-octadec-4-en-3-ol, 136.



To a solution of D-*erythro*-sphingosine (46 mg, 0.153 mmol) in CH_2Cl_2 (1.5 mL) at room temperature, Et_3N (32 μL, 0.230 mmol), TBDPSCl (44 μL, 0.169 mmol) and 4-DMAP (ca. 5 mg, cat.) were added. After stirring for 4 h, the reaction was quenched with H_2O (10 mL), extracted with EtOAc (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The

crude was purified by column chromatography on silica (hexane/EtOAc 5:1 to 100% EtOAc) to obtain **136** as a colorless oil (33 mg, 40% yield).

R_f 0.20 (hexane/EtOAc 1:5);

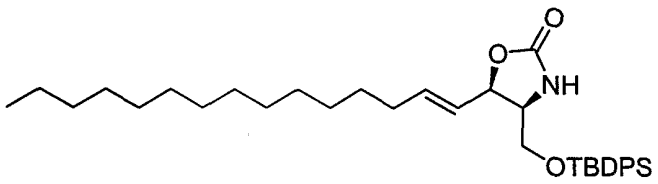
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 6.9 Hz), 1.06 (s, 9H), 1.20-1.40 (m, 22H), 1.91 (br s, 3H), 2.01 (q, 2H, *J*= 6.5 Hz), 2.93 (q, 1H, *J*= 5.5 Hz), 3.69 (d, 2H, *J*= 4.5 Hz), 4.09 (t, 1H, *J*= 6.1 Hz), 5.40 (dd, 1H, *J*= 15.3, 6.9 Hz), 5.73 (dt, 1H, *J*= 15.4, 6.5 Hz), 7.35-7.46 (m, 6H), 7.64-7.68 (m, 4H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 19.2, 22.7, 26.8, 29.2, 29.2, 29.3, 29.5, 29.6, 29.7, 31.9, 32.3, 56.3, 66.2, 74.6, 127.7, 128.9, 129.8, 133.1, 134.1, 135.5;

ESMS calcd for $C_{34}H_{56}NO_2Si$ (M+H) 538.4, found 538.4.

Example 133:

(4*S*,5*R*)-4-(*tert*-Butyldimethylsilyloxymethyl)-5-(*n*-pentadec-2'-enyl)-1,3-oxazolidinone, 137.



According to the method of Example 105, from aminoalcohol **136** (33 mg, 0.061 mmol), oxazolidinone **137** was obtained as a colorless oil (32 mg, 92% yield).

R_f 0.60 (hexane/EtOAc 1:1);

^{1}H NMR (300 MHz, $CDCl_3$) δ 0.86 (t, 3H, *J*= 7.0 Hz), 1.06 (s, 9H), 1.20-1.40 (m, 22H), 2.00 (q, 2H, *J*= 6.9 Hz), 3.58 (dd, 1H, *J*= 10.6, 4.7 Hz), 3.64 (dd, 1H, *J*= 10.6, 6.7 Hz), 3.82-3.88 (m, 1H), 5.02 (t, 1H, *J*= 8.1 Hz),

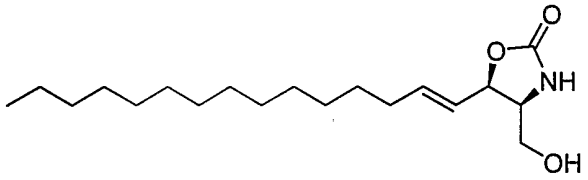
5.32 (br s, 1H), 5.51 (dd, 1H, *J*= 15.4, 8.1 Hz), 5.83 (dt, 1H, *J*= 15.4, 6.5 Hz), 7.37-7.46 (m, 6H), 7.61-7.65 (m, 4H);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 19.1, 22.7, 26.7, 28.7, 29.1, 29.3, 29.4, 29.5, 29.6, 31.9, 32.1, 57.2, 63.1, 79.4, 122.1, 127.9, 130.0, 132.7, 135.5, 138.4, 158.9;

ESMS calcd for $C_{35}H_{53}NO_3SiNa$ (M+Na) 586.4, found 586.5.

Example 134:

(4*S*,5*R*)-4-(Hydroxymethyl)-5-(*n*-pentadec-2'-enyl)-1,3-oxazolidinone, 138.



To a solution of **137** (32 mg, 0.057 mmol) in THF (0.6 mL) at room temperature, TBAF (1M in THF, 113 μL, 0.113 mmol) was added. After stirring for 30 min, the reaction was quenched with H_2O (10 mL), extracted with EtOAc (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 1:1 to 1:5) to obtain alcohol **138** as a white solid (13 mg, 70% yield).

R_f 0.27 (hexane/EtOAc 1:5);

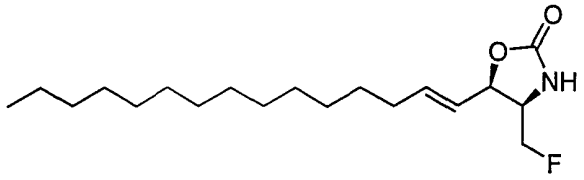
^{1}H NMR (300 MHz, CD_3OD) δ 0.90 (t, 3H, *J*= 6.7 Hz), 1.25-1.50 (m, 22H), 2.12 (q, 2H, *J*= 6.9 Hz), 3.51 (dd, 1H, *J*= 11.6, 5.9 Hz), 3.58 (dd, 1H, *J*= 11.6, 4.0 Hz), 3.84 (ddd, 1H, *J*= 8.4, 5.9, 4.2 Hz), 5.10 (t, 1H, *J*= 8.2 Hz), 5.67 (dd, 1H, *J*= 15.4, 8.2 Hz), 5.90 (dt, 1H, *J*= 15.4, 6.7 Hz);

^{13}C NMR (75 MHz, CD_3OD) δ 14.5, 23.8, 30.0, 30.2, 30.5, 30.6, 30.8, 33.1, 33.3, 58.7, 62.2, 81.5, 124.4, 139.1, 168.1;

ESMS calcd for $C_{19}H_{35}NO_3Na$ (M+Na) 348.3, found 348.2.

Example 135:

(4*S*,5*R*)-4-(Fluoromethyl)-5-(*n*-pentadec-2'-enyl)-1,3-oxazolidinone, 139.



To a cold (-78 °C) solution of **138** (11.5 mg, 0.035 mmol) in THF (0.35 mL), DAST (14 μL, 0.106 mmol) was added. After stirring for 30 min, the mixture was warmed up to room temperature and stirred for 2 h. The reaction was quenched with $NaHCO_3$ (5 mL), extracted with EtOAc (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 1:1) to obtain fluoride **139** as a white solid (7.5 mg, 65% yield).

R_f 0.22 (hexane/EtOAc 1:1);

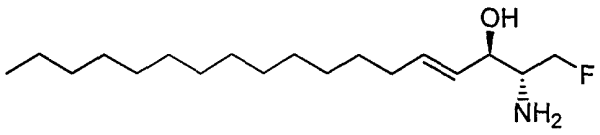
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.88 (t, 3H, *J*= 7.0 Hz), 1.20-1.40 (m, 22H), 2.09 (q, 2H, *J*= 6.9 Hz), 4.03-4.13 (m, 1H), 4.41 (dm, 2H, *J*= 46.5 Hz), 5.11 (t, 1H, *J*= 7.9 Hz), 5.44 (br s, 1H), 5.48 (dd, 1H, *J*= 15.3, 8.1 Hz), 5.95 (dt, 1H, *J*= 15.3, 7.0 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.6, 28.6, 29.1, 29.3, 29.4, 29.5, 29.6, 31.9, 32.2, 55.3 (d), 79.0 (d), 81.8 (d), 121.4, 139.4, 159.3;

ESMS calcd for $C_{19}H_{34}FNO_2Na$ (M+Na) 350.3, found 350.2.

Example 136:

(2*S*,3*R*)-2-Amino-1-fluoro-octadec-4-en-3-ol, 140.



To a solution of **139** (46 mg, 0.140 mmol) in dioxane (2.5 mL), NaOH (1M, 1.40 mL, 1.405 mmol) was added. After stirring for 4 h at 100 °C, the reaction was quenched with H_2O (10 mL), extracted with EtOAc (3x10 mL), dried over Na_2SO_4 and concentrated *in vacuo*. The crude was purified by column chromatography on silica (hexane/EtOAc 1:1 to 100% EtOAc) to obtain aminoalcohol **140** as a white solid (20 mg, 47% yield).

R_f 0.18 (hexane/EtOAc 1:5);

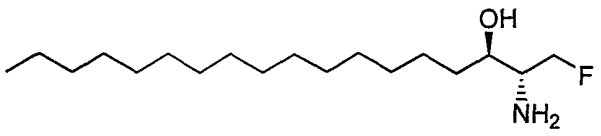
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.2 Hz), 1.20-1.40 (m, 22H), 1.79 (br s, 3H), 2.05 (q, 2H, *J*= 6.9 Hz), 3.03-3.13 (m, 1H), 4.05 (t, 1H, *J*= 6.4 Hz), 4.40 (ddd, 1H, *J*= 47.5, 9.2, 6.9 Hz), 4.51 (ddd, 1H, *J*= 47.0, 9.2, 4.2 Hz), 5.44 (dd, 1H, *J*= 15.6, 7.4 Hz), 5.76 (dt, 1H, *J*= 15.4, 6.9 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.7, 29.1, 29.2, 29.3, 29.4, 29.6, 29.6, 31.9, 32.3, 55.2 (d), 73.1 (d), 85.2 (d), 128.4, 135.2;

ESMS calcd for $C_{18}H_{37}FNO$ (M+H) 302.3, found 302.2.

Example 137:

(2*S*,3*R*)-2-Amino-1-fluoro-3-octadecanol, 141.



According to the method of Example 89, from olefin **140** (4 mg, 0.013 mmol), aminoalcohol **141** was obtained as a white solid (1.8 mg, 45% yield).

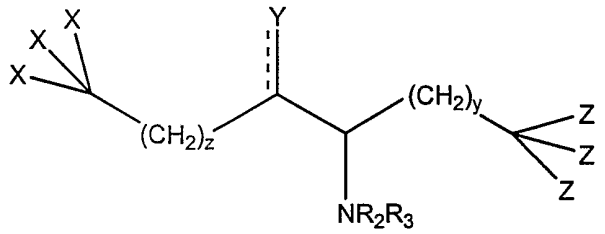
^{1}H NMR (300 MHz, $CDCl_3$) δ 0.87 (t, 3H, *J*= 6.7 Hz), 1.20-1.40 (m, 26H), 1.50-1.60 (m, 2H), 1.87 (br s, 3H), 3.04-3.14 (m, 1H), 3.54-3.62 (m, 1H), 4.40 (ddd, 1H, *J*= 48.0, 9.2, 7.4 Hz), 4.56 (ddd, 1H, *J*= 46.8, 9.2, 3.9 Hz);

^{13}C NMR (75 MHz, $CDCl_3$) δ 14.1, 22.7, 26.0, 29.3, 29.6, 29.7, 31.9, 32.9, 55.0 (d), 72.5 (d), 85.1 (d);

ESMS calcd for $C_{18}H_{39}FNO$ (M+H) 304.3, found 304.3.

CLAIMS

1. A compound of formula:



wherein:

each X is the same or different, and represents H, OH, OR′, SH, SR′, SOR′, SO_2R', NO_2, NH_2, NHR′, $N(R')_2$, NHC(O)R′, CN, halogen, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic, or two groups X may together form =O;

Y is NR_1, OR_1, PR_1, SR_1, or halogen, wherein the number of substituents R_1 is selected to suit the valency and each R_1 is independently selected of H, OH, C(=O)R′, P(=O)R′R″, S(=O)R′R″, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl, and wherein the dotted line indicates an optional double bond such that Y can also be =O or =N-OH or the group Y with NR_2R_3 and the intervening atoms can form a heterocycle;

each Z is the same or different, and represents H, OH, OR′, SH, SR′, SOR′, SO_2R', NO_2, NH_2, NHR′, $N(R')_2$, NHC(O)R′, CN, halogen, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18}

alkynyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaromatic, or two groups Z may together form =O;

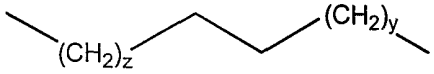
z is 0 to 25;

y is 0 to 20;

R_2 and R_3 are the same or different and each is H, C(=O)R´, C(=S)R', P(=O)R´R´´, S(=O)R´R´´, $S(=O)_2$R´, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl;

each of the R´, R´´ groups is independently selected from the group consisting of H, OH, NO_2, NH_2, NHR', NR'R", SH, CN, halogen, =O, C(=O)H, $C(=O)CH_3$, CO_2H, CO_2CH_3, substituted or unsubstituted C_1-C_{18} alkyl, substituted or unsubstituted C_1-C_{18} alkoxy, substituted or unsubstituted C_2-C_{18} alkenyl, substituted or unsubstituted C_2-C_{18} alkynyl, substituted or unsubstituted aryl;

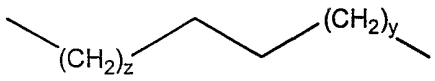
there may be one or more unsaturations in the hydrocarbon backbone defined by the chain:



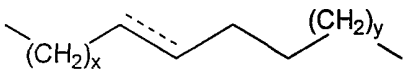
and salts thereof;

with the exception of a C_{16} – C_{24} 2-amino-3-hydroxyalkane or a C_{16} – C_{24} 2-amino-3-hydroxyalkene.

2. A compound or salt according to claim 1, wherein the hydrocarbon backbone defined by the chain:



is of the formula:



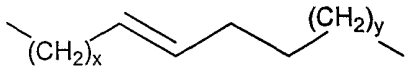
where x is 0 to 20 and the dotted line indicates one or more double bonds in the backbone.

3. A compound or salt according to claim 2, wherein there is a double bond at the position shown by the dotted line.

4. A compound or salt according to any preceding claim, wherein the terminal group $-C(X)_3$ is $-CH_3$.

5. A compound or salt according to any preceding claim, wherein there are no unsaturations in the hydrocarbon backbone.

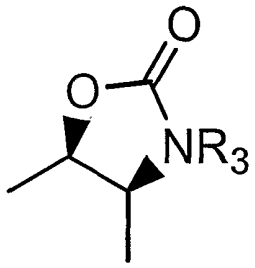
6. A compound or salt according to claim 2 or a claim dependent thereon, wherein the hydrocarbon backbone is of the formula:



where x and y are as defined.

7. A compound or salt according to any preceding claim, wherein z is from 10 to 19.

8. A compound or salt according to any preceding claim, wherein Y is OH, O(C=O)R' where R' is optionally halogen-substituted alkyl, OR' where R' is alkyl, halogen, OP(=O)R'$_2$ where R' is alkoxy, NH_2, =O, =NOH, or the group Y when OH with NR_2R_3 and the intervening atoms form a heterocycle of formula:



9. A compound or salt according to any preceding claim, wherein R_2 and R_3 are the same.

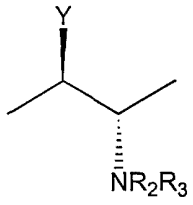
10. A compound or salt according to any preceding claim, wherein at least one of R_2 and R_3 is alkyl; alkyl substituted by aryl; hydrogen; C(=O)R´ where R´ is alkyl or alkoxy, halogen-substituted alkyl, optionally substituted amino-substitued alkyl, aryloxy, alkoxy, optionally substituted aryl-substituted alkenyl; (C=S)NHR' where R' is aryl; (C=O)NHR' where R'

is aryl or alkyl; SO_2R' where R' is alkyl, or (C=O)R' where R' is optionally subsituted aminoalkyl thereby giving an optionally subsistituted aminacid acyl group.

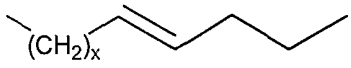
11. A compound or salt according to any preceding claim, wherein y is 0 to 3.

12. A compound or salt according to any preceding claim, wherein the terminal group $-C(Z)_3$ is $-CH_3$.

13. A compound or salt according to any preceding claim, which has the stereochemistry



14. A compound or salt according to any preceding claim, wherein two or more of the following criteria are met:
the terminal group $-C(X)_3$ is $-CH_3$;
z is 10, 11, 12, 13, 14, 15, 16, 17, 18 or 19
the hydrocarbon backbone is of the formula:



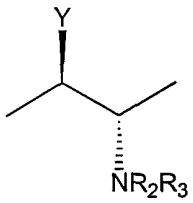
where x is 12;
Y is OR_1 where R_1 is H, methyl, acetyl, PO(OMe)2, COCF3 or Y is Cl, $NH_3^+Cl^-$, =O, =NOH;

R_2 and R_3 are independently selected from the group consisting of H, methyl, acetyl, benzyl, Boc, CSNHPh, CONHPh, $CONH^nBu$, SO_2Me, $COCF_3$, COCH=CHPh, $COCH=CHPhCF_3$, $COC_{15}H_{32}$, $COCH(NHBoc)CHMe_2$, $COCH(NH_3^+Cl^-)CHMe_2$;

y is 0, 1, 2 or 3;

Z is the same or different, and represents H, F, methyl, ethyl, hydroxyphenyl, amino, dibenzylamino or NH_3Cl;

the stereochemistry is



or

the compound or salt is in the form of a salt.

15. A compound or salt according to claim 14, which meets one the following criteria:

z is not 12, 13 or 14;

Y is not OH;

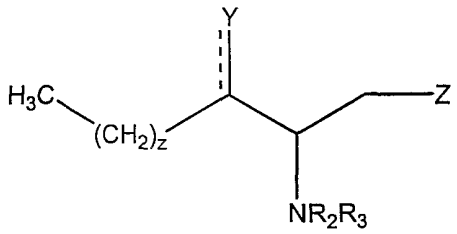
At least one of R_2 and R_3 is not hydrogen;

y is at least 1;

at least one Z is not hydrogen;

the compound or salt is in the form of a salt.

16. A compound or salt according to any preceding claim, which is of the formula:



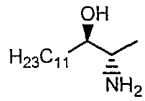
where z is 10 to 19;

Y is OR_1 where R_1 is H, methyl, acetyl, $PO(OMe)_2$, $COCF_3$ or Y is Cl, $NH_3^+Cl^-$, =O, =NOH;

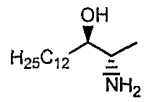
R_2 and R_3 are independently selected from the group consisting of H, methyl, acetyl, benzyl, Boc, CSNHPh, CONHPh, $CONH^nBu$, SO_2Me, $COCF_3$, COCH=CHPh, $COCH=CHPhCF_3$, $COC_{15}H_{32}$, $COCH(NHBoc)CHMe_2$, $COCH(NH_3^+Cl^-)CHMe_2$;

Z represents H, F, methyl, ethyl, hydroxyphenyl, amino, dibenzylamino or NH_3Cl.

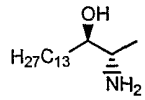
17. A compound or salt according to any preceding claim, which is one of the following compounds:



30



32



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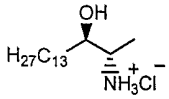

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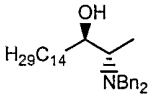

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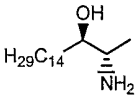

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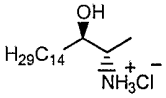

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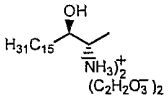

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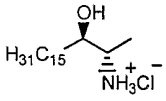

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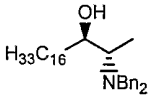

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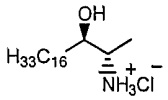

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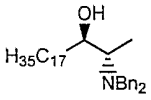

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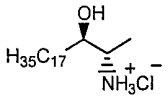

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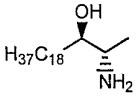

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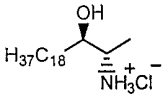

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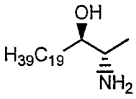

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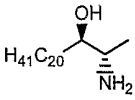

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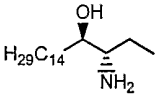

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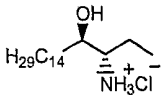

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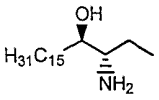

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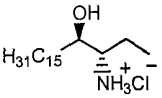

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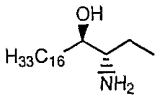

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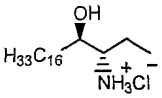

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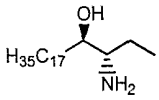

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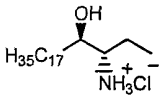

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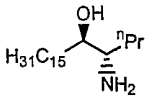

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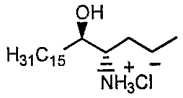

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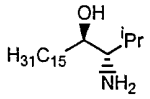

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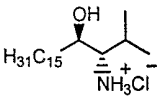

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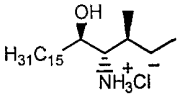

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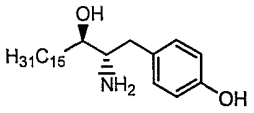

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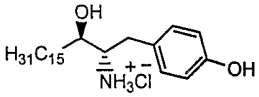

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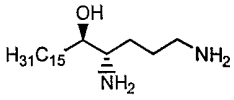

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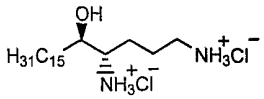

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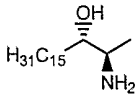

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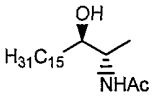

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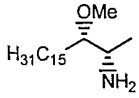

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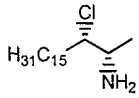

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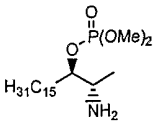

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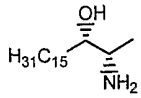

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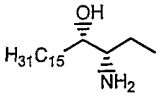

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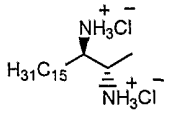

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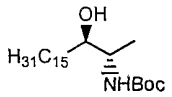

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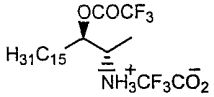

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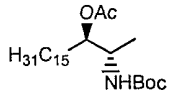

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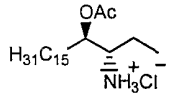

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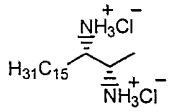

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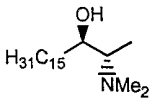

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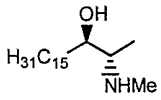

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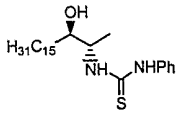

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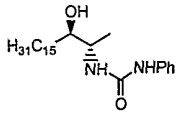

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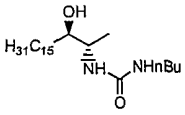

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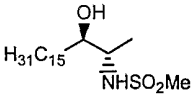

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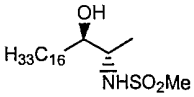

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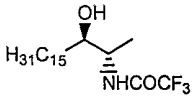

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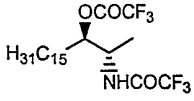

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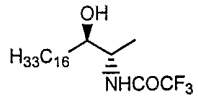

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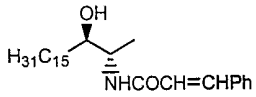

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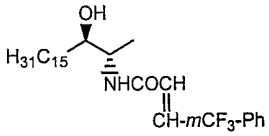

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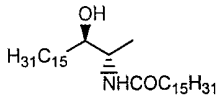

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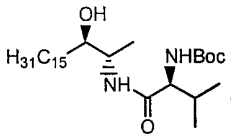

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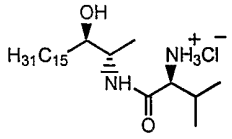

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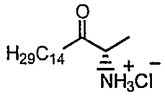

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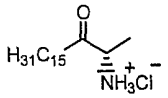
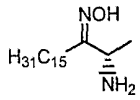
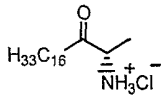


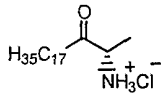
126



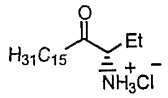
127



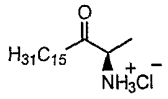
129



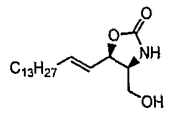
131



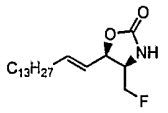
133



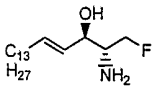
135



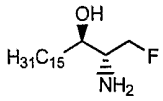
138



139



140



141.

18. A pharmaceutical composition comprising a compound or salt according to any preceding claim, together with a pharmaceutically acceptable carrier.

19. The use of a comopund according to any of claims 1 to 17 in the preparation of a medicament for the treatment of a tumor.

20. A method of treating a tumor which includes administration of an effective amount of a compound or salt according to any of claims 1 to 17, or a compostion according to claim 18.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 01/02487

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07F9/22 C07F9/28 C07D263/20 A61K31/045 A61K31/13
A61K31/16 A61K31/42 A61K31/66

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C07F C07D A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	GARRIDO L ET AL: "Obscuraminols, new unsaturated amino alcohols from the tunicate Pseudodistoma obscurum: structure and absolute configuration" TETRAHEDRON, vol. 57, no. 21, 21 May 2001 (2001-05-21), pages 4579-4588, XP004240727 ISSN: 0040-4020 the whole document	1-20
X	WO 99 52521 A (PHARMA MAR) 21 October 1999 (1999-10-21) cited in the application the whole document	1-20

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 October 2001	23/10/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Elliott, A

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
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X	DATABASE CAPLUS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; accession no. 1960:30191, 9 January 1961 (1961-01-09) LEONARDI, A: "Cytolytic and cytostatic activity of synthetic necrosamine (4,5-diaminoeicosane) on two strains of human tumor cells cultivated in vitro" XP002179016 abstract & GIORN. ITAL. CHEMIOTERAP. (1958), 5, 291-5,	1,4,5, 7-12,15, 16,18-20
X	IKAWA: "Studies on a Lipopolysaccharide from Escherichai Coli" ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, vol. 133, no. 2, 1966, pages 476-485, XP001018540 ISSN: 0077-8923 see whole document, especially tables 5 & 6	1-16, 18-20
X	JARES-ERIJMAN E A ET AL: "CRUCIGASTERINS, NEW POLYUNSATURATED AMINO ALCOHOLS FROM THE MEDITERRANEAN TUNICATE PSEUDODISTOMA CRUCIGASTER" JOURNAL OF ORGANIC CHEMISTRY, vol. 58, no. 21, 1993, pages 5732-5737, XP001021691 ISSN: 0022-3263 the whole document	1-16, 18-20
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A	Compounds 1,2,4,5,6a,6b,7a,7b,11-14; first paragraph	18-20

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	KOK J W ET AL: "DIHYDROCERMIDE BIOLOGY STRUCTURE-SPECIFIC METABOLISM AND INTRACELLULAR LOCALIZATION" JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 272, no. 34, 22 August 1997 (1997-08-22), pages 2428-2436, XP001019054 ISSN: 0021-9258 the whole document ---	1-17
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X	JIMENEZ C ET AL: "NOVEL MARINE SPONGE AMINO ACIDS, 10. XESTOAMINOLS FROM XESTOSPONGIA SP" JOURNAL OF NATURAL PRODUCTS, vol. 53, no. 4, July 1990 (1990-07), pages 978-982, XP001025933 ISSN: 0163-3864 page 979 ---	1-17
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X	TUREL R J ET AL: "SPHINGOLIPIDS: PART II-SYNTHESIS OF 1,3-DIHYDROXY-2-AMINOTETRADECANE" INDIAN JOURNAL OF CHEMISTRY, vol. 18B, September 1979 (1979-09), pages 219-221, XP001025832 Compounds (II)(a)-(e), (III)-(V) ---	1,4,5, 7-12,15, 16
X	PROSTENIK M ET AL: "Necrosaminreihe, 6. Mitteilung: Über eine einfache Synthese von racemischem Necrosamin" BULLETIN SCIENTIFIQUE, CONSEIL DES ACADEMIES DES SCIENCES ET DES ARTS DE LA RSF DE YOUGOSLAVIE, SECTION A : SCIENCES NATURELLES, TECHNIQUES ET MÉDICALES, vol. 17, no. 5-6, 1972, pages 145-146, XP001025912 ISSN: 0350-1558 Compounds 3-5 --- -/--	1,4,5, 7-12,15, 16

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	GERENCEVIK M ET AL: "N-Acyl Amino Acids in the Dakin-West Reaction: Replacements of the Acyl Groups" BULLETIN SCIENTIFIQUE, CONSEIL DES ACADEMIES DES SCIENCES ET DES ARTS DE LA RSF DE YOUGOSLAVIE, SECTION A : SCIENCES NATURELLES, TECHNIQUES ET MÉDICALES, vol. 15, no. 5-6, 1970, page 158 XP001025913 ISSN: 0350-1558 the whole document	1,4,5,7, 8,10-12, 15
X	RAO K V ET AL: "ISOLATION AND CONSTITUTION OF PEDICELLIC ACID A NEW DICARBOXYLIC ACID FROM THE LEAVES OF DIDYMOCARPUS PEDICELLATA" TETRAHEDRON, vol. 22, no. 4, 1966, pages 1495-1498, XP001018545 ISSN: 0040-4020 Page 1497, the diamine	1,4,5, 7-12,15
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X	"SYNTHETISCHE VERSUCHE IN DER NECROSAMIN-REIHE" NATURWISSENSCHAFTEN, vol. 43, 1956, pages 349-350, XP001025955 Compounds Ia and Ib	1,4,5, 7-12,15
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	MORI ET AL: "Synthesis and absolute configuration of the two epimeric aliphatic amino alcohols '(5E,7E)-2-amino-5,7-tetradecadien-3-ols! isolated from a sponge, Xestospongia sp." LIEBIGS ANNALEN DER CHEMIE, no. 2, 1992, pages 131-137, XP001025984 ISSN: 0170-2041 the whole document	1-16
X	US 2 363 082 A (RINGK WILLIAM F) 21 November 1944 (1944-11-21) page 3, column 1, line 30 -page 6, column 1, line 20	1,4,5, 8-12,15
X	US 2 399 118 A (HOMEYER AUGUST H) 23 April 1946 (1946-04-23) example 5	1,4,5, 8-12,15
X	US 2 346 771 A (WYNDHAM TATUM WILLIAM ET AL) 18 April 1944 (1944-04-18) page 1, column 1, line 54	1,4,5, 8-12,15
X	GB 1 057 652 A (MERCK & CO INC) 8 February 1967 (1967-02-08) example 1	1,5, 8-11,15
X	GB 1 433 920 A (ICI LTD) 28 April 1976 (1976-04-28) page 4, column 1, line 21 - line 22	1,4,5, 8-12,15
X	US 2 424 311 A (HARRIS STANTON A) 22 July 1947 (1947-07-22) claim 12	1,4,5, 8-10,15
X	DE 828 547 C (CASELLA FARBWERKE MAINKUR) 17 January 1952 (1952-01-17) example 1	1,4,5, 8-12,15
X	KOEHL W: "UEBER DIE BETA,BETA-DIAMINOADIPINSAEURE UND EINE NEUE METHODE ZUR DARSTELLUNG VON GAMMA-AMINOSAEUREN" BERICHTE DER DEUTSCHEN CHEMISCHEN GESELLSCHAFT, vol. 36, 1903, pages 172-174, XP001018508 ISSN: 0365-9496 Title	1,5, 8-11,15

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INTERNATIONAL SEARCH REPORT

Inte ıal Application No
PC1/GB 01/02487

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	JAENECKE E: "UEBER AMIDODIAETHYLKETON UND AMIDODIAETHYLCARBINOL" BERICHTE DER DEUTSCHEN CHEMISCHEN GESELLSCHAFT, no. 32, 1899, pages 1095-1103, XP001018509 ISSN: 0365-9496 Bottom of page 1099 ---	1,4,5, 8-12,15
X	STRAUSS E: "UEBER AMINOPROPANOL-(2.1) UND AMINOBUTANOL-(2.3)" BERICHTE DER DEUTSCHEN CHEMISCHEN GESELLSCHAFT, vol. 33, 1900, pages 2825-2830, XP001018510 ISSN: 0365-9496 Page 2827, line 1 & page 2828, line 22 ---	1,4,5, 8-11,15
X	CLAUS A: "ZUR KENNTNISS DER BIRBROMBERNSTEINSAEURE AUS DER DIAMIDOBERNSTEINSAEURE" CHEMISCHE BERICHTE, vol. 15, 1882, pages 1844-1851, XP001018524 ISSN: 0009-2940 the whole document -----	1,5, 8-11,15

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-15, 18-20 (all partially)

The initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claim(s) may be said to define subject-matter for which protection might legitimately be sought (Article 6 PCT). For these reasons, a meaningful search over the whole breadth of the claim(s) is impossible. Consequently the search was concentrated on the characteristic feature of claim 7 but, as this also resultied in a large number of relevant hits, the search has been restricted to the subject-matter of claim 16 and the exemplified compounds of claim 17 which would appear to represent the essence of the application. Claims 18-20 have been searched only for subject-matter referring back to compounds of claims 16 and 17.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

ormation on patent family members

Int[illegible]ial Application No
PCT/GB 01/02487

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			AU	3432199 A	01-11-1999
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