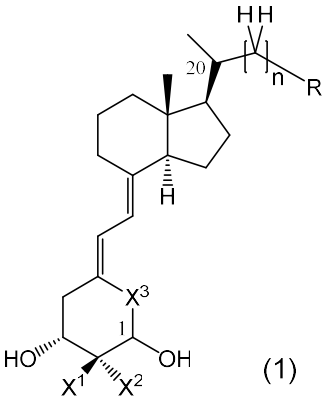
[CLAIMS]

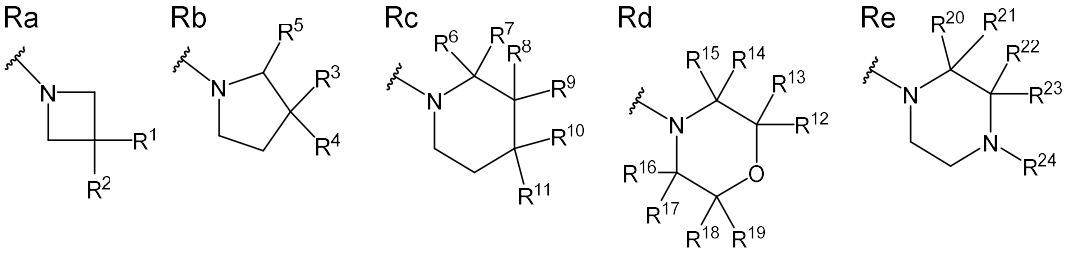
[Claim 1]

A vitamin D derivative represented by the following formula (1) or a pharmaceutically acceptable salt or solvate thereof,



(1)

in the formula, R represents any structure of Ra, Rb, Rc, Rd, or Re in the following formulas:



R^1, R^3, R^8 and R^{10} each independently represents a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms, a C_3 to C_6 cycloalkyl group, a C_1 to C_6 alkoxy group optionally substituted with 1 to 3 halogen atoms, a halogen atom, or a hydrogen atom,

R^2, R^4, R^9 and R^{11} each independently represents a hydrogen atom, a hydroxy group, or a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms,

wherein, when R^1, R^3, R^8 and R^{10} each independently represents a C_1 to C_6 alkoxy group optionally substituted with 1 to 3 halogen atoms, or a halogen atom, each of R^2, R^4, R^9 and R^{11}, substituting the same carbon atom together with R^1, R^3, R^8, or R^{10}, is not a hydroxy group,

R^6, R^7, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18} R^{19}, R^{20}, R^{21}, R^{22}, and R^{23}, each independently represents a hydrogen atom, a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms, or a C_3 to C_6 cycloalkyl group,

each pair of R^1 and R^2, R^3 and R^4, R^6 and R^7, R^{10} and R^{11}, R^{12} and R^{13}, R^{14} and R^{15}, R^{16} and R^{17}, R^{18} and R^{19}, R^{20} and R^{21}, and R^{22} and R^{23} can be bonded with each other to form a 3- to 5-membered ring structure,

R^5 represents a hydrogen atom, a C_1 to C_6 alkyl group optionally substituted with a $-OR^{501}$ or a C_3 to C_6 cycloalkyl group optionally substituted with a $-OR^{501}$, and R^{501} represents a hydrogen atom or a C_1 to C_6 alkyl group,

R^{24} represents a hydrogen atom, a C_1 to C_3 alkyl group or a C_1 to C_3 alkylsulfonyl group,

the stereochemistry at C-2 in the pyrrolidine ring (Rb) represents either (R) configuration or (S) configuration,

X^1 and X^2 each independently represents a hydrogen atom or a C_1 to C_3 alkyl group, or X^1 and X^2 together form a methylidene group, or $-(CH_2)_{m,}-$ wherein m is an integer of 2 to 5,

X^3 represents a CH_2 group, or a $C{=}CH_2$ group wherein, when X^1 and X^2 together form a methylidene group, X^3 is not a $C{=}CH_2$ group.

n represents an integer of 1 to 3,

the stereochemistry of the hydroxyl group at C-1 represents either (R)

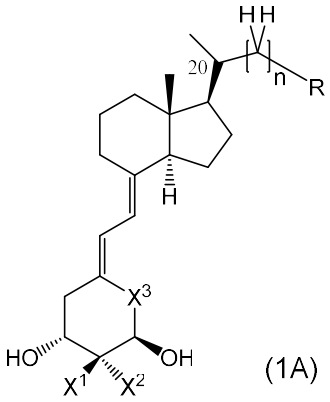
configuration or (S) configuration, and

wherein the stereochemistry of the methyl group at C-20 represents either (R) configuration or (S) configuration.

[Claim 2]

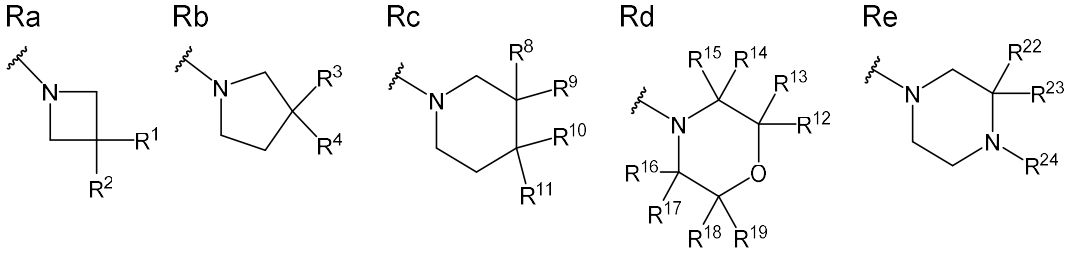
The vitamin D derivative according to claim 1, or a pharmaceutically acceptable salt or solvate thereof, wherein:

the vitamin D derivative represented by formula (1) is represented by the following formula (1A):



(1A)

in the formula, R represents any structure of Ra, Rb, Rc, Rd, or Re in the following formulas:



R^1, R^3, R^8 and R^{10} each independently represents a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms, a C_3 to C_6 cycloalkyl group, a C_1 to C_6

alkoxy group optionally substituted with 1 to 3 halogen atoms, a halogen atom, or a hydrogen atom,

R^2, R^4, R^9 and R^{11} each independently represents a hydrogen atom, a hydroxy group, or a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms,

wherein, when R^1, R^3, R^8 and R^{10} each independently represents a C_1 to C_6 alkoxy group optionally substituted with 1 to 3 halogen atoms, or a halogen atom, each of R^2, R^4, R^9 and R^{11}, substituting the same carbon atom together with R^1, R^3, R^8, or R^{10}, is not a hydroxy group,

R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{22}, and R^{23} each independently represents a hydrogen atom, a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms, or a C_3 to C_6 cycloalkyl group,

each pair of R^1 and R^2, R^3 and R^4, R^8 and R^9, R^{10} and R^{11}, R^{12} and R^{13}, R^{14} and R^{15}, R^{16} and R^{17}, R^{18} and R^{19}, and R^{22} and R^{23} can be bonded with each other to form a 3- to 5-membered ring structure,

R^{24} represents a hydrogen atom, a C_1 to C_3 alkyl group or a C_1 to C_3 alkylsulfonyl group,

X^1 and X^2 each independently represents a hydrogen atom or a C_1 to C_3 alkyl group, or X^1 and X^2 together form a methylidene group, or $-(CH_2)_m-$, wherein m is an integer of 2 to 5,

X^3 represents a CH_2 group, or a $C{=}CH_2$ group wherein, when X^1 and X^2 together form a methylidene group, X^3 is not a $C{=}CH_2$ group,

n represents an integer of 1 to 3, and

wherein the stereochemistry of the methyl group at C-20 represents either (R) configuration or (S) configuration.

[Claim 3]

The vitamin D derivative according to claim 2 or a pharmaceutically acceptable salt or solvate thereof, wherein:

in the above formula (1)

R^1, R^3, R^8 and R^{10} each independently represents a C_1 to C_6 alkyl group optionally substituted with 1 to 3 fluorine atoms, a C_3 to C_6 cycloalkyl group, a C_1 to C_6 alkoxy group optionally substituted with 1 to 3 fluorine atoms, a fluorine atom, or a hydrogen atom,

R^2, R^4, R^9 and R^{11} each independently represents a hydrogen atom, a hydroxy group, or a C_1 to C_3 alkyl group optionally substituted with 1 to 3 fluorine atoms,

wherein, when R^1, R^3, R^8 and R^{10} each independently represents a C_1 to C_6 alkoxy group optionally substituted with 1 to 3 fluorine atoms, or a fluorine atom, each of R^2, R^4, R^9 and R^{11}, substituting the same carbon atom together with R^1, R^3, R^8, or R^{10}, is not a hydroxy group,

R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{22}, and R^{23}, each independently represents a hydrogen atom, a C_1 to C_6 alkyl group optionally substituted with 1 to 3 fluorine atoms, or a C_3 to C_6 cycloalkyl group,

each pair of R^1 and R^2, R^3 and R^4, R^8 and R^9, R^{10} and R^{11}, R^{12} and R^{13}, R^{14} and R^{15}, R^{16} and R^{17}, R^{18} and R^{19}, and R^{22} and R^{23} can be bonded with each other to form a 3- to 5-membered ring structure,

R^{24} represents a hydrogen atom, a C_1 to C_3 alkyl group or a C_1 to C_3 alkylsulfonyl group,

X^1 and X^2 each independently represents a hydrogen atom or a methyl group, or X^1 and X^2 together form a methylidene group,

X^3 represents a CH_2 group, or a $C=CH_2$ group, wherein, when X^1 and X^2 together form a methylidene group, X^3 is not a $C=CH_2$ group,

n represents an integer of 1 to 3, and

wherein the stereochemistry of the methyl group at C-20 represents either (R) configuration or (S) configuration.

[Claim 4]

The vitamin D derivative according to any one of claims 1 to 3 or a pharmaceutically acceptable salt or solvate thereof, wherein R represents Ra.

[Claim 5]

The vitamin D derivative according to any one of claims 1 to 3 or a pharmaceutically acceptable salt or solvate thereof, wherein R represents Rb.

[Claim 6]

The vitamin D derivative according to any one of claims 1 to 3 or a pharmaceutically acceptable salt or solvate thereof, wherein R represents Rc.

[Claim 7]

The vitamin D derivative according to any one of claims 1 to 3 or a pharmaceutically acceptable salt or solvate thereof, wherein R represents Rd.

[Claim 8]

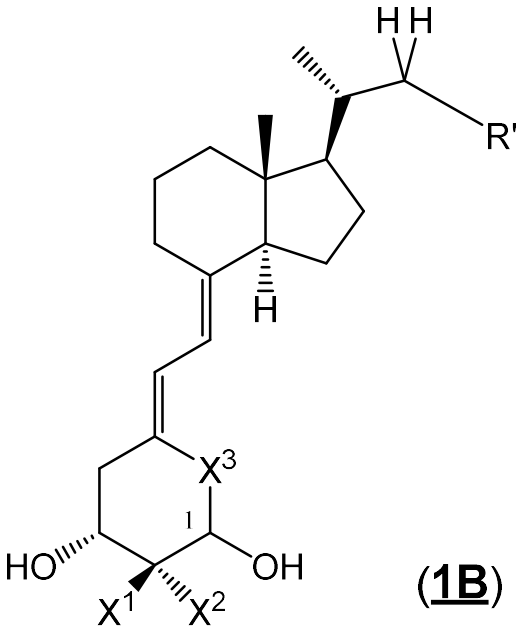
The vitamin D derivative according to any one of claims 1 to 3 or a pharmaceutically acceptable salt or solvate thereof, wherein R represents Re.

[Claim 9]

The vitamin D derivative according to claim 1, or a pharmaceutically acceptable salt or solvate thereof, wherein:

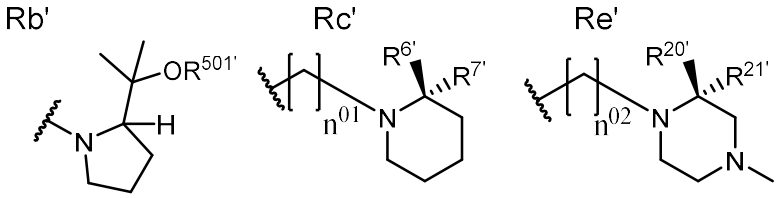
the vitamin D derivative represented by formula (1) is represented by the

following formula (1B):



(1B)

in the formula, R' represents any structure of Rb', Rc', or Re' in the following formulas:



$R^{6'}$, $R^{7'}$, $R^{20'}$, and $R^{21'}$ each independently represents a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms, a C_3 to C_6 cycloalkyl group or a hydrogen atom, for each pair of $R^{6'}$, $R^{7'}$, $R^{20'}$, and $R^{21'}$, except when both are a hydrogen atom at the same time,

each pair of $R^{6'}$ and $R^{7'}$, and $R^{20'}$ and $R^{21'}$ can be bonded with each other to form a 3- to 5- membered ring structure,

$R^{501'}$ represents a hydrogen atom or a C_1 to C_6 alkyl group,

n^{01} and n^{02} each independently represents an integer of 0 or 1,

the stereochemistry at C-2 in the pyrrolidine ring (Rb') represents either (R) configuration or (S) configuration,

X^1 and X^2 each independently represents a hydrogen atom or a C_1 to C_3 alkyl group, or X^1 and X^2 together form a methylidene group, or $-(CH_2)_m-$, wherein m is an integer of 2 to 5,

X^3 represents a CH_2 group, or a $C=CH_2$ group, wherein, when X^1 and X^2 together form a methylidene group, X^3 is not a $C=CH_2$ group, and

wherein the stereochemistry of the hydroxyl group at C-1 represents either (R) configuration or (S) configuration.

[Claim 10]

The vitamin D derivative according to claim 9 or a pharmaceutically acceptable salt or solvate thereof, wherein R' represents Rb'.

[Claim 11]

The vitamin D derivative according to claim 9 or a pharmaceutically acceptable salt or solvate thereof, wherein R' represents Rc'.

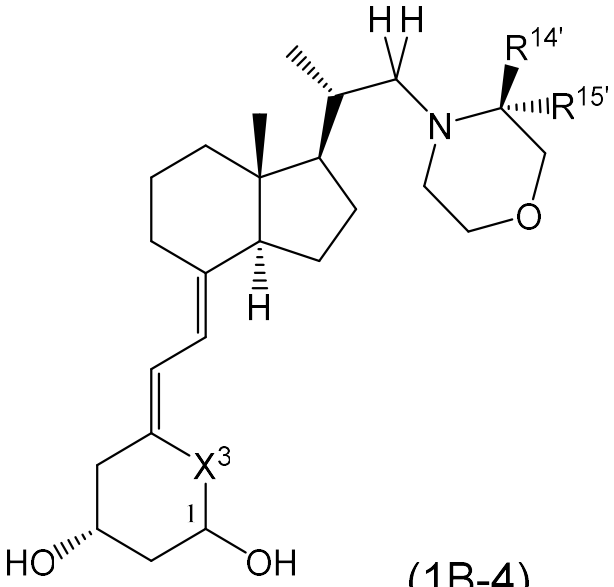
[Claim 12]

The vitamin D derivative according to claim 9 or a pharmaceutically acceptable salt or solvate thereof, wherein R' represents Re'.

[Claim 13]

The vitamin D derivative according to claim 1, or a pharmaceutically acceptable salt or solvate thereof, wherein:

the vitamin D derivative represented by formula (1) is represented by the following formula (1B-4):



(1B-4)

in the formula (1B-4), $R^{14'}$ and $R^{15'}$ each independently represents a C_1 to C_6 alkyl group optionally substituted with 1 to 3 halogen atoms, a C_3 to C_6 cycloalkyl group, or a hydrogen atom, except when $R^{14'}$ and $R^{15'}$ are a hydrogen atom at the same time.

$R^{14'}$ and $R^{15'}$ can be bonded with each other to form a 3- to 5-membered ring structure,

X^3 represents a CH_2 group or $C{=}CH_2$ group, and

wherein the stereochemistry of the hydroxyl group at C-1 represents either (R) configuration or (S) configuration.

[Claim 14]

The vitamin D derivative according to any one of claims 1 to 12 or a pharmaceutically acceptable salt or solvate thereof, wherein X^1 represents a hydrogen atom or a methyl group, X^2 represents a hydrogen atom, and X^3 represents a $C{=}CH_2$ group.

[Claim 15]

The vitamin D derivative according to any one of claims 1 to 13 or a

pharmaceutically acceptable salt or solvate thereof, wherein X^1 and X^2 represent a hydrogen atom, and X^3 represents a $C=CH_2$ group.

[Claim 16]

The vitamin D derivative according to any one of claims 1 to 13 or a pharmaceutically acceptable salt or solvate thereof, wherein X^1 and X^2 represent a hydrogen atom and X^3 represents a CH_2 group.

[Claim 17]

The vitamin D derivative according to any one of claims 1 to 12 or a pharmaceutically acceptable salt or solvate thereof, wherein X^1 and X^2 together form a methylidene group, and X^3 represents a CH_2 group.

[Claim 18]

A vitamin D derivative selected from any one of the following or a pharmaceutically acceptable salt or solvate thereof:

(1) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-3-methylpyrrolidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B001)

(2) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-3-methylpyrrolidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B002)

(3) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-3-methylpyrrolidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B003)

(4) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-3-methylpyrrolidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol

(Compound B004)

(5) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-ethylpyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B005)

(6) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-ethylpyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B006)

(7) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-ethylpyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B007)

(8) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-ethylpyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B008)

(9) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((R)-1-((S)-3-fluoropyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B018)

(10) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B020)

(11) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound B021)

(12) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-

diol (Compound B022)

(13) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B023)

(14) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B024)

(15) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound B025)

(16) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B026)

(17) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B027)

(18) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B028)

(19) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound B029))

(20) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-

diol (Compound B030)

(21) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)pyrrolidin)-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B031)

(22) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B032)

(23) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound B033))

(24) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B034)

(25) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(1,1-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B035)

(26) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B036)

(27) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B037)

(28) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-

methylenecyclohexane-1,3-diol (Compound B038))

(29) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound B039))

(30) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B040)

(31) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B041)

(32) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B042)

(33) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(2,2-difluoroethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B043)

(34) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((2S)-1-(3-hydroxy-3-(trifluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B044)

(35) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((2S)-1-(3-hydroxy-3-(trifluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B045)

(36) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((2S)-1-(3-hydroxy-3-(trifluoromethyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-

methylenecyclohexane-1,3-diol (Compound B046)

(37) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B047)

(38) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B048)

(39) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B049)

(40) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B050)

(41) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B051)

(42) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(difluoromethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B052)

(43) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(2,2-difluoroethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B053)

(44) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-

methylenecyclohexane-1,3-diol (Compound B054)

(45) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(2,2-difluoroethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B055)

(46) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B056)

(47) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(2,2-difluoroethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B057)

(48) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethoxy)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B058)

(49) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(3,3-difluoropropyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B059)

(50) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(3,3-difluoropropyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound B060)

(51) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(3,3-difluoropropyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound B061)

(52) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(3,3-difluoropropyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-

methylenecyclohexane-1,3-diol (Compound B062)

(53) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(3,3-difluoropropyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B063)

(54) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(3,3-difluoropropyl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B064)

(55) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((S)-3-(difluoromethyl)pyrrolidin-1-yl)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B080)

(56) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((R)-3-(difluoromethyl)pyrrolidin-1-yl)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B081)

(57) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((S)-3-(difluoromethoxy)pyrrolidin-1-yl)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B086)

(58) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((R)-3-(difluoromethoxy)pyrrolidin-1-yl)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound B087)

(59) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(4-hydroxy-4-(trifluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound C001)

(60) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(4-hydroxy-4-(trifluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-

ylidene)ethylidene)cyclohexane-1,3-diol (Compound C002)

(61) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((R)-1-(4-hydroxy-4-(trifluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound C005)

(62) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((R)-1-(4-hydroxy-4-(trifluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound C006)

(63) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-1-(4-(difluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound C019)

(64) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(4-(difluoromethyl)-4-hydroxypiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C022)

(65) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((2S)-1-(3-(difluoromethyl)-3-hydroxypiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C036)

(66) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((2S)-1-(3-hydroxy-3-methylpiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound C037)

(67) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-hydroxy-3-methylpiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound C039)

(68) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-

methylenecyclohexane-1,3-diol (Compound C048)

(69) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C049)

(70) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(difluoromethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound C050)

(71) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-3-(2,2-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound C051)

(72) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound C052)

(73) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C053)

(74) (1R,2S,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-3-(1,1-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methyl-4-methylenecyclohexane-1,3-diol (Compound C054))

(75) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(4-(1,1-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C055)

(76) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-1-(4-(2,2-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-

methylenecyclohexane-1,3-diol (Compound C056)

(77) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-1-(4-(1,1-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C057)

(78) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(4-(2,2-difluoroethyl)piperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound C059)

(79) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-morpholinopropan-2-yl)-octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D004)

(80) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(difluoromethyl)morpholino)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D008)

(81) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-2-methylmorpholino)propan-2-yl)-octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D010)

(82) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(4-oxa-7-azaspiro[2.5]octan-7-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D019)

(83) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-morpholinobutan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound D022)

(84) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-morpholinobutan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D023)

(85) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-morpholinobutan-2-

yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D024)

(86) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((S)-2-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D025)

(87) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((R)-3-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D031)

(88) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((S)-3-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D032)

(89) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((S)-2-(difluoromethyl)morpholino)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D033)

(90) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((S)-2-(difluoromethyl)morpholino)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D034)

(91) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((S)-2-(difluoromethyl)morpholino)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methyloctahydro-1,3-diol (Compound D035)

(92) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((R)-2-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound D040)

(93) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((S)-2-

methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D041)

(94) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((R)-3-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D042)

(95) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((S)-3-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D043)

(96) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-5-morpholinopentan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound D044)

(97) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((S)-3-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound D045)

(98) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((R)-3-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound D046)

(99) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((R)-2-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound D047)

(100) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((S)-2-methylmorpholino)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound D048)

(101) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-(3,3-dimethylmorpholino)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound

D049)

(201) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F001)

(202) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F002)

(203) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(2,2-dimethylpiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F003)

(204) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-3-methylmorpholino)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F004)

(205) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-3-methylmorpholino)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F005)

(206) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(3,3-dimethylmorpholino)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F006)

(207) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(2-hydroxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F013)

(208) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-2-(2-hydroxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-

methylenecyclohexane-1,3-diol (Compound F014)

(209) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(2-methoxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F015)

(210) (1R,3S,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-2-(2-methoxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound F016)

(211) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G001)

(212) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G002)

(213) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(2,2-dimethylpiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G003)

(214) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-3-methylmorpholino)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G004)

(215) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-3-methylmorpholino)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G005)

(216) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(3,3-dimethylmorpholino)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound

G006)

(217) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(2-hydroxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G013)

(218) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-2-(2-hydroxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G014)

(219) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(2-methoxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G015)

(220) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-2-(2-methoxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G016)

(221) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((R)-4-((R)-2-methylpiperidin-1-yl)butan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G018)

(222) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((R)-4-((R)-2,4-dimethylpiperazin-1-yl)butan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)cyclohexane-1,3-diol (Compound G020)

(223) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound H001)

(224) (1R,3R)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-

1,3-diol (Compound H002)

(225) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(2,2-dimethylpiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound H003)

(226) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(2-hydroxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound H013)

(227) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-2-(2-hydroxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound H014)

(228) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((R)-2-(2-methoxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound H015)

(229) (1R,3R)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-((S)-2-(2-methoxypropan-2-yl)pyrrolidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-2-methylenecyclohexane-1,3-diol (Compound H016)

(230) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound I001)

(231) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-2-methylpiperidin-1-yl)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound I002)

(232) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(2,2-dimethylpiperidin-1-yl)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-

diol (Compound I003)

(233) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((S)-3-methylmorpholino)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound I004)

(234) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-7a-methyl-1-((S)-1-((R)-3-methylmorpholino)propan-2-yl)octahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound I005)

(235) (1R,3R,Z)-5-(2-((1R,3aS,7aR,E)-1-((S)-1-(3,3-dimethylmorpholino)propan-2-yl)-7a-methyloctahydro-4H-inden-4-ylidene)ethylidene)-4-methylenecyclohexane-1,3-diol (Compound I006)

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[Claim 19]

The vitamin D derivative according to any one of claims 1 to 18 or a pharmaceutically acceptable salt or solvate thereof, characterized by promoting differentiation from an oligodendrocyte progenitor cell to an oligodendrocyte by binding to Protein Disulfide isomerase A3 (PDIA3).

[Claim 20]

A pharmaceutical composition comprising the vitamin D derivative according to any one of claims 1 to 18 or a pharmaceutically acceptable salt or solvate thereof, and a pharmaceutically acceptable carrier or base.

[Claim 21]

A remyelination promoter comprising the vitamin D derivative according to any one of claims 1 to 18 or a pharmaceutically acceptable salt or solvate thereof.

[Claim 22]

A therapeutic agent comprising the vitamin D derivative according to any one of claims 1 to 18 or a pharmaceutically acceptable salt or solvate thereof as an active ingredient, the therapeutic agent for the treatment of one or more diseases selected from the group consisting of multiple sclerosis, neuromyelitis optica, progressive multifocal leukoencephalopathy, multiple system atrophy, acute disseminated encephalomyelitis, atopic myelitis, HTLV-1-associated myelopathy, HIV-associated leukoencephalopathy, Krabbe's disease, Guillain-Barre syndrome, Fisher's syndrome, chronic inflammatory demyelinating polyneuropathy, Charcot-Marie-Tooth disease, Parkinson's disease, schizophrenia, bipolar disorder, major depressive disorder, autistic spectrum disorder, attention deficit hyperactivity disorder, obsessive-compulsive disorder, post-traumatic stress disorders, drug-dependent depression, autism, Alzheimer-type dementia, and ischemic stroke.