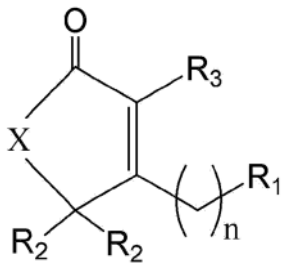
CLAIMS

[Claim 1]

A compound represented by the following formula (I) or a salt thereof:



(I)

wherein

X represents $-CH_2-$, $-CH(CH_3)-$, $-CH_2-CH_2-$, or $-CH=CH-$,

$R_1$ represents $-CH_2OR_4$, $-CH_2OCON(R_5)_2$, $-CONHR_6$, or a cyano group,

$R_2$s are identical or different and each represent a hydrogen atom or a methyl group, or two $R_2$s may form a cyclopropyl group together with the adjacent carbon atom,

$R_3$ represents a hydrogen atom, a methyl group, $-CH_2OR_7$, or a halogen atom,

$R_4$ represents $C_mH_{2m+1}$,

$R_5$s are identical or different and each represent a hydrogen atom or a methyl group,

$R_6$ represents a hydrogen atom or a methyl group,

$R_7$ represents a C1-C3 alkyl group,

m represents an integer of 1 to 14, and

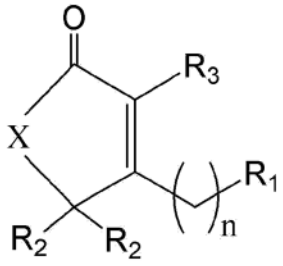
n represents an integer of 11 to 14,

with the proviso that when $R_4$ is a linear alkyl group, the sum of m and n is an integer of 12 to 17, and when $R_4$ is a branched alkyl

group, the sum of $m_b$ and n is an integer of 12 to 17, wherein $m_b$ is the number of carbon atoms of the longest linear chain of the branched alkyl group.

[Claim 2]

A compound represented by the following formula (I) or a salt thereof:



(I)

wherein

X represents $-CH_2-$, $-CH(CH_3)-$, $-CH_2-CH_2-$, or $-CH=CH-$,

$R_1$ represents $-CH_2OR_4$, $-CH_2OCON(R_5)_2$, $-CONHR_6$, or a cyano group,

$R_2$s are identical or different and each represent a hydrogen atom or a methyl group, or two $R_2$s may form a cyclopropyl group together with the adjacent carbon atom,

$R_3$ represents a hydrogen atom, a methyl group, $-CH_2OR_7$, or a halogen atom,

$R_4$ represents $C_mH_{2m+1}$,

$R_5$s are identical or different and each represent a hydrogen atom or a methyl group,

$R_6$ represents a hydrogen atom or a methyl group,

$R_7$ represents a C1-C3 alkyl group,

m represents an integer of 1 to 14, and

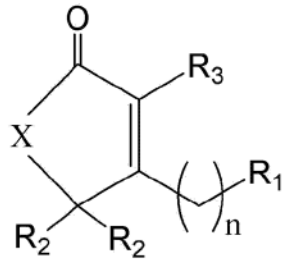
n represents an integer of 11 to 14,

with the proviso that when $R_4$ is a linear alkyl group, the sum of m and n is an integer of 12 to 15, and when $R_4$ is a branched alkyl

group, the sum of $m_b$ and n is an integer of 12 to 15, wherein $m_b$ is the number of carbon atoms of the longest linear chain of the branched alkyl group.

[Claim 3]

A compound represented by the following formula (I) or a salt thereof:



(I)

wherein

X represents $-CH_2-$, $-CH(CH_3)-$, $-CH_2-CH_2-$, or $-CH=CH-$,

$R_1$ represents $-CH_2OR_4$, $-CH_2OCON(CH_3)_2$, $-CONHR_6$, or a cyano group,

$R_2$s are identical or different and each represent a hydrogen atom or a methyl group, or two $R_2$s may form a cyclopropyl group together with the adjacent carbon atom, and

$R_3$ represents a hydrogen atom, a methyl group, $-CH_2OCH_3$, or an iodine atom,

with the proviso that when $R_2$s are identical or different and each represent a hydrogen atom or a methyl group, $R_3$ represents a hydrogen atom, a methyl group, $-CH_2OCH_3$, or an iodine atom, and when two $R_2$s form a cyclopropyl group together with the adjacent carbon atom, $R_3$ represents a methyl group, $-CH_2OCH_3$, or an iodine atom,

$R_4$ represents a methyl group, an ethyl group, an n-propyl group, or an isopropyl group,

n is an integer of 11 to 14,

with the proviso that when $R_4$ is a methyl group, n represents an

integer of 11 to 14, when $R_4$ is an ethyl group or an isopropyl group, n represents an integer of 11 to 13, and when $R_4$ is an n-propyl group, n is 11 or 12, and

$R_6$ represents a hydrogen atom or a methyl group.

[Claim 4]

The compound or a salt thereof according to any one of claims 1 to 3, wherein X represents $-CH_2-$, $-CH_2-CH_2-$, or -CH=CH- in formula (I).

[Claim 5]

The compound or a salt thereof according to any one of claims 1 to 4,

wherein in formula (I),

$R_1$ represents $-CH_2OR_4$, $-CONH_2$, or a cyano group,

$R_2$s are identical or different and each represent a hydrogen atom or a methyl group, or two $R_2$s may form a cyclopropyl group together with the adjacent carbon atom,

$R_3$ represents a hydrogen atom, a methyl group, $-CH_2OCH_3$, or an iodine atom, with the proviso that when $R_3$ is a hydrogen atom, each $R_2$ is a hydrogen atom, when $R_3$ is a methyl group, $-CH_2OCH_3$, or an iodine atom, $R_2$s are identical or different and each represent a hydrogen atom or a methyl group, or two $R_2$s may form a cyclopropyl group together with the adjacent carbon atom, and

$R_4$ represents a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, with the proviso that when $R_4$ is a methyl group, n represents an integer of 11 to 14, when $R_4$ is an ethyl group or an isopropyl group, n represents an integer of 11 to 13, and when $R_4$ is an n-propyl group, n is 11 or 12.

[Claim 6]

The compound or a salt thereof according to any one of claims 1 to 5, wherein in formula (I),

X represents $-CH_2-$ or $-CH_2-CH_2-$,

$R_1$ represents $-CH_2OR_4$ or $-CONH_2$,

each $R_2$ is a methyl group,

$R_3$ represents a methyl group or $-CH_2OCH_3$, and

$R_4$ represents a methyl group, an ethyl group, or an isopropyl group,

with the proviso that when $R_4$ is a methyl group, n represents an integer of 11 to 14, and when $R_4$ is an ethyl group or an isopropyl group, n represents an integer of 11 to 13.

[Claim 7]

The compound or a salt thereof according to any one of claims 1 to 6, wherein X represents $-CH_2-CH_2-$ in formula (I).

[Claim 8]

The compound or a salt thereof according to any one of claims 1 to 7, which is any one of the following compounds (1) to (10):

(1) 3-(12-methoxydodecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(2) 3-(12-ethoxydodecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(3) 3-(12-isopropoxydodecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(4) 3-(13-methoxytridecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(5) 3-(13-ethoxytridecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(6) 3-(13-isopropoxytridecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(7) 3-(14-methoxytetradecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(8) 3-(14-ethoxytetradecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

(9) 3-(14-isopropoxytetradecyl)-2,4,4-trimethylcyclohex-2-en-1-one,

and

(10) 3-(15-methoxypentadecyl)-2,4,4-trimethylcyclohex-2-en-1-one.

[Claim 9]

The compound or a salt thereof according to any one of claims 1 to 8, wherein the compound is 3-(15-methoxypentadecyl)-2,4,4-trimethylcyclohex-2-en-1-one.

[Claim 10]

A neurite outgrowth agent comprising the compound or a salt thereof of any one of claims 1 to 9 as an active ingredient.

[Claim 11]

A therapeutic agent for use in the treatment of a neurodegenerative disease, comprising the compound or a salt thereof of any one of claims 1 to 9 as an active ingredient.

[Claim 12]

A therapeutic agent for use in the treatment of amyotrophic lateral sclerosis, comprising the compound or a salt thereof of any one of claims 1 to 9 as an active ingredient.

[Claim 13]

A therapeutic agent for use in the treatment of pain, comprising the compound or a salt thereof of any one of claims 1 to 9 as an active ingredient.

[Claim 14]

A therapeutic agent for use in the treatment of a lower urinary

tract dysfunction, comprising the compound or a salt thereof of any one of claims 1 to 9 as an active ingredient.

[Claim 15]

A pharmaceutical composition comprising

the compound or a salt thereof of any one of claims 1 to 9, and

a pharmaceutical carrier.

[Claim 16]

Use of the compound or a salt thereof of any one of claims 1 to 9 in the manufacture of a therapeutic agent for the treatment of a neurodegenerative disease.

[Claim 17]

Use of the compound or a salt thereof of any one of claims 1 to 9 in the manufacture of a therapeutic agent for the treatment of amyotrophic lateral sclerosis.

[Claim 18]

Use of the compound or a salt thereof of any one of claims 1 to 9 in the manufacture of a therapeutic agent for pain.

[Claim 19]

Use of the compound or a salt thereof of any one of claims 1 to 9 in the manufacture of a therapeutic agent for a lower urinary tract dysfunction.