with a partially crosslinked structure include, but are not limited to, those with a structure shown below and the like.
[Chemical Formula 39]



[0084]

"$C_{1-6}$ alkoxy" or "$C_{1-6}$ alkoxy group" refers to "$C_{1-6}$ alkyloxy", and the "$C_{1-6}$ alkyl" moiety is defined the same as the "$C_{1-6}$ alkyl" described above. "$C_{1-6}$ alkoxy" is preferably "$C_{1-4}$ alkoxy", and more preferably "$C_{1-3}$ alkoxy". Specific examples of "$C_{1-3}$ alkoxy" include methoxy, ethoxy, propoxy, 1-methylethoxy, and the like. Specific examples of "$C_{1-4}$ alkoxy" include, in addition to the specific examples specified for the "$C_{1-3}$ alkoxy" described above, butoxy, 1,1-dimethylethoxy, 1-methylpropoxy, 2-methylpropoxy, and the like. Specific examples of "$C_{1-6}$ alkoxy" include, in addition to the specific examples specified for the "$C_{1-4}$ alkoxy" described above, pentyloxy, 1,1-dimethylpropoxy, 1,2-dimethylpropoxy, 1-methylbutoxy, 2-methylbutoxy, 4-methylpentyloxy, 3-methylpentyloxy, 2-methylpentyloxy, 1-methylpentyloxy, hexyloxy, and the like.

[0085]

"$C_{3-6}$ alicyclic oxy" or "$C_{3-6}$ alicyclic oxy group" refers to a ($C_{3-6}$ alicyclic group)-O-group, and the $C_{3-6}$ alicyclic moiety is defined the same as a $C_{3-6}$ alicyclic group. "$C_{3-6}$ alicyclic oxy group" includes "$C_{3-6}$ cycloalkoxy group". "Cycloalkoxy group" refers to "cycloalkyloxy", and the "cycloalkyl" moiety is defined the same as the "cycloalkyl" described above. Specific examples of "$C_{3-6}$ alicyclic oxy group" include a cyclopropoxy group, cyclobutoxy group, cyclopentoxy group, cyclohexoxy group, and the like.

[0086]

The $C_{6-10}$ aryl moiety of "$C_{6-10}$ aryloxy group" is defined the same as the $C_{6-10}$ aryl described above. "$C_{6-10}$ aryloxy

[0090]

"$C_{3-10}$ alicyclic thio" or "$C_{3-10}$ alicyclic thio group" refers to a ($C_{3-10}$ alicyclic group)-S-group, and the $C_{3-10}$ alicyclic moiety is defined the same as the $C_{3-10}$ alicyclic group described above. "$C_{3-10}$ alicyclic thio group" is preferably a "$C_{3-6}$ alicyclic thio group". Specific examples of "$C_{3-6}$ alicyclic thio group" include, but are not limited to, a cyclopropylthio group, cyclobutylthio group, cyclopentylthio group, cyclohexylthio group, and the like.

[0091]

The $C_{6-10}$ aryl moiety of "$C_{6-10}$ arylthio" or "$C_{6-10}$ arylthio group" is defined the same as the $C_{6-10}$ aryl described above. "$C_{6-10}$ arylthio group" is preferably a "$C_6$ or $C_{10}$ arylthio group". Specific examples of "$C_{6-10}$ arylthio group" include, but are not limited to, a phenylthio group, 1-naphthylthio group, 2-naphthylthio group, and the like.

[0092]

The 5- or 6-membered heteroaryl moiety of "5- or 6-membered heteroarylthio" or "5- or 6-membered heteroarylthio group" is defined the same as the "5-membered heteroaryl" or "6-membered heteroaryl" described above. Specific examples of "5- or 6-membered heteroarylthio group" include, but are not limited to, a pyrazoylthio group, triazoylthio group, thiazoylthio group, thiadiazoylthio group, pyridylthio group, pyridazoylthio group, and the like.

[0093]

The 4- to 10-membered non-aryl heterocycle moiety of "4- to 10-membered non-aryl heterocyclyl thio" or "4- to 10-membered non-aryl heterocyclyl thio group" is defined the same as the "4- to 10-membered non-aryl heterocycle" described above. "4- to 10-membered non-aryl heterocyclyl thio group" is preferably a "4- to 6-membered non-aryl heterocyclyl thio group". Specific examples of "4- to 10-membered non-aryl heterocyclyl thio group" include, but are

measurement, 20 mM Hepes (Thermo Fisher Scientific, cat# 15630-080) and 0.1% bovine serum albumin (Sigma-Aldrich, cat# A9576)-containing Hank's buffer (Thermo Fisher Scientific, cat# 14065-056) was used.

[0207]

The test compounds were serially diluted with a dimethyl sulfoxide (DMSO) solution so that the final concentration would be 0.1 to 30 μM. First, the compounds were diluted to a 333-fold concentration of the final concentration with DMSO, and then diluted with a medium for measurement to prepare a concentrate with a 5-fold concentration of the final concentration.

[0208]

The intensity of fluorescence of a calcium probe was measured over time with FDSS7000EX (Hamamatsu Photonics) to evaluate the change in intracellular calcium concentrations. Compounds were added using FDSS7000EX. After 120 seconds from adding 10 μL of test compound solutions, 10 μL of 4-aminopyridine solution (final concentration of 100 μM) (FUJIFILM Wako Pure Chemical, cat# 016-02781) was added for an addition 6 minutes and 30 seconds measurement of fluorescence intensity. The frequency of calcium oscillation induced by 4-aminopyridine was quantified as an indicator of nerve excitation. With 100% as the mean frequency of wells treated with DMSO as a control, the inhibitory activity (%) at each serial dilution concentration of the test compounds was determined, and the 50% inhibitory concentration (IC50) or inhibition rate (%) at a certain concentration was determined for each test compound. Table 2 shows inhibitory activity data for representative compounds.

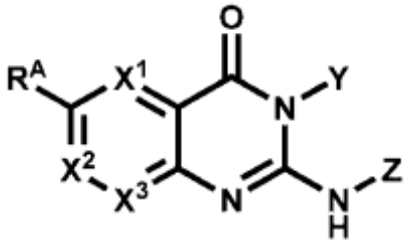
[0214]

The intensity of fluorescence of a calcium probe was measured over time with FDSS7000EX (Hamamatsu Photonics) to evaluate the change in intracellular calcium concentration. Compounds were added using FDSS7000EX. After 120 seconds from adding 10 µL of test compound solutions, 10 µL of 4-aminopyridine solution (final concentration: 100 µM) (FUJIFILM Wako Pure Chemical, cat# 016-02781) was added for an additional 5 minute measurement of fluorescence intensity. The frequency of calcium oscillation induced by 4-aminopyridine was quantified as an indicator of nerve excitation. With 100% as the mean frequency of wells treated with DMSO as a control, the inhibitory activity (%) at each serial dilution concentration of the test compounds was determined, and the 50% inhibitory concentration (IC50) was determined for each test compound. Table 3 shows inhibitory activity data for representative compounds.

Claims

1. A compound represented by formula (1):

[Chemical Formula 1]



(1)

or a pharmaceutically acceptable salt thereof

wherein

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

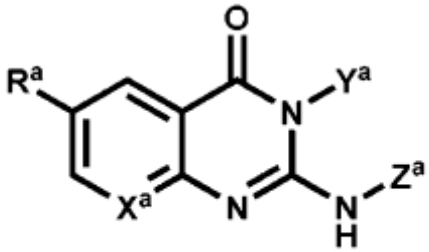
Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy,

provided that the compound is not a compound represented by formula (W-1):

[Chemical Formula 2]



(W-1)

wherein

(A-1) $R^a$ is chloro, $X^a$ is CH, and $Y^a$ and $Z^a$ are both unsubstituted phenyl or 4-chlorophenyl;

(A-2) $R^a$ is chloro, $X^a$ is CH, $Y^a$ is 2-bromophenyl, and $Z^a$ is 4-chlorophenyl;

(B-1) $R^a$ is bromo, $X^a$ is CH, and $Y^a$ and $Z^a$ are both unsubstituted phenyl or 4-chlorophenyl;

(B-2) $R^a$ is bromo, $X^a$ is CBr, $Y^a$ is 2-chlorophenyl, and $Z^a$ is unsubstituted phenyl;

(C-1) $R^a$ is iodo, $X^a$ is CH, $Y^a$ is 4-methylphenyl, and $Z^a$ is unsubstituted phenyl or 4-methylphenyl;

(C-2) $R^a$ is iodo, $X^a$ is CH, $Y^a$ is 2-methylphenyl, and $Z^a$ is unsubstituted phenyl;

(D) $R^a$ is methyl, $X^a$ is CH, and $Y^a$ and $Z^a$ are both unsubstituted phenyl or 4-chlorophenyl;

(E) $R^a$ is cyano, $X^a$ is CH, and $Y^a$ and $Z^a$ are both unsubstituted phenyl;

(F-1) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is phenyl having position 2 substituted with ketone, and $Z^a$ is unsubstituted phenyl, 4-methylphenyl, 4-chlorophenyl, or 4-methoxyphenyl;

(F-2) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is 4-methylphenyl, and $Z^a$ is unsubstituted phenyl, 2-methylphenyl, 3-methylphenyl, 4-fluorophenyl, 3-chlorophenyl, 4-chlorophenyl, 3-methoxyphenyl, or 4-methoxyphenyl;

(F-3) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is 4-chlorophenyl or 4-methoxyphenyl, and $Z^a$ is 4-methylsufonylphenyl or 4-sulfaguanidylphenyl;

(F-4) $R^a$ is a hydrogen atom, $X^a$ is CH, and $Y^a$ and $Z^a$ are both unsubstituted phenyl, 2-methylphenyl, 4-methylphenyl, 4-fluorophenyl, 3-chlorophenyl, 4-chlorophenyl, 4-bromophenyl, 2-methoxyphenyl, 4-methoxyphenyl, 2,4,6-trimethylphenyl, 2,6-diisopropylphenyl, or naphthyl;
(F-5) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is unsubstituted phenyl, and $Z^a$ is 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 4-ethylphenyl, 4-methoxyphenyl, 4-bromophenyl, 4-methanesulfonylphenyl, or 2-hydroxyphenyl;
(F-6) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is 2-methylphenyl, 3-methylphenyl, 4-methylesterphenyl, 4-chlorophenyl, or 2-hydroxyphenyl, and $Z^a$ is unsubstituted phenyl;
(F-7) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is 2-bromophenyl, and $Z^a$ is 4-cyano-2-hydroxyphenyl;
(F-8) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is 2,3-dimethylphenyl, and $Z^a$ is 4-ethylphenyl; or
(F-9) $R^a$ is a hydrogen atom, $X^a$ is CH, $Y^a$ is 2-methylesterphenyl, and $Z^a$ is 3-methylphenyl.

2. The compound or the pharmaceutically acceptable salt thereof according to claim 1, wherein $X^1$ is $CR^1$.

3. The compound or the pharmaceutically acceptable salt thereof according to claim 1 or 2, wherein $X^2$ is $CR^2$.

4. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 3, wherein $X^3$ is $CR^3$.

5. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 4, wherein $R^1$, $R^2$, and $R^3$ are each independently a hydrogen atom, halogen, $C_{1-6}$ alkoxy, or $C_{1-6}$ alkyl (wherein the alkoxy group and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group

consisting of halogen, hydroxyl, and $C_{1-6}$ alkoxy).

6. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 4, wherein $R^1$, $R^2$, and $R^3$ are each independently a hydrogen atom, fluorine, chloro, $C_{1-6}$ alkoxy, or $C_{1-6}$ alkyl.

7. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 4, wherein $R^1$, $R^2$, and $R^3$ are all hydrogen atoms.

8. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 7, wherein $R^A$ is a hydrogen atom, halogen, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, or $C_{1-6}$ alkyl (wherein the alkoxy group, the methanesulfonyl group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of halogen, hydroxy, and $C_{1-6}$ alkoxy).

9. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 7, wherein $R^A$ is a hydrogen atom, fluorine, chloro, $C_{1-6}$ alkoxy, or $C_{1-6}$ alkyl (wherein the alkoxy group and the alkyl group are optionally substituted with 1 to 3 fluorine or methoxy).

10. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 7, wherein $R^A$ is fluorine or chloro.

11. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, wherein Y is $C_{6-10}$ aryl optionally substituted with 1 to 5 of the same or different substituents selected from the group consisting of halogen, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, dimethylamino, and $C_{1-6}$ alkyl (wherein the alkoxy group, the methanesulfonyl

group, the dimethylamino group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of halogen, hydroxy, and $C_{1-6}$ alkoxy), or 6- to 10-membered heteroaryl optionally substituted with 1 to 5 of the same or different substituents selected from the group consisting of halogen, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, dimethylamino, and $C_{1-6}$ alkyl (wherein the alkoxy group, the methanesulfonyl group, the dimethylamino group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of halogen, hydroxy, and $C_{1-6}$ alkoxy).

12. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, wherein Y is phenyl optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine, chloro, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, dimethylamino, and $C_{1-6}$ alkyl (wherein the alkoxy group, the methanesulfonyl group, the dimethylamino group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine and hydroxy), or 6-membered heteroaryl optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine, chloro, $C_{1-6}$ alkoxy, and $C_{1-6}$ alkyl (wherein the alkoxy group and the alkyl group are optionally substituted with 1 to 3 fluorine).

13. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, wherein Y is 6-membered unsubstituted heteroaryl or phenyl optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine, chloro, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, dimethylamino, and $C_{1-6}$ alkyl

(wherein the alkoxy group, the methanesulfonyl group, the dimethylamino group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine and hydroxy).

14. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, wherein Y is unsubstituted pyridine, unsubstituted pyrimidine or phenyl optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine, chloro, cyano, methoxy, methyl, and $-CH_2OH$.

15. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, wherein Y is unsubstituted phenyl, unsubstituted pyridine, or unsubstituted pyrimidine.

16. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 15, wherein

Z is $C_{6-10}$ aryl optionally substituted with 1 to 5 of the same or different substituents selected from the group consisting of halogen, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, dimethylamino, $C_{1-6}$ alkyl ester, $-CONH_2$, and $C_{1-6}$ alkyl (wherein the alkoxy group, the methanesulfonyl group, the dimethylamino group, the alkyl ester group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of halogen, hydroxy, $C_{1-6}$ alkoxy, and $-NR^4R^5$), and

$R^4$ and $R^5$ each independently, and if there are a plurality of instances of $R^4$ and $R^5$, they also independently represent a hydrogen atom, an optionally substituted $C_{3-6}$ alicyclic group, and optionally substituted $C_{1-6}$ alkyl, wherein $R^4$ and $R^5$, together with the nitrogen atom to which they are attached, may form a 4- to 10-membered nitrogen-containing non-aryl heterocycle (wherein the nitrogen-containing non-

aryl heterocycle is optionally substituted).

17. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 16, wherein

Z is phenyl optionally substituted with 1 to 2 of the same or different substituents selected from the group consisting of fluorine, chloro, cyano, $C_{1-6}$ alkoxy, methanesulfonyl, dimethylamino, methyl ester, $-CONH_2$, and $C_{1-6}$ alkyl (wherein the alkoxy group, the methanesulfonyl group, the dimethylamino group, the methyl ester group, and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine, hydroxy, $C_{1-6}$ alkoxy, and $-NR^4R^5$), and

$R^4$ and $R^5$ each independently, and if there are a plurality of instances of $R^4$ and $R^5$, they also independently represent a hydrogen atom, an optionally substituted $C_{3-6}$ alicyclic group, and optionally substituted $C_{1-6}$ alkyl, wherein $R^4$ and $R^5$, together with the nitrogen atom to which they are attached, may form a 4- to 10-membered nitrogen-containing non-aryl heterocycle (wherein the nitrogen-containing non-aryl heterocycle is optionally substituted).

18. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 17, wherein

Z is phenyl optionally substituted with 1 to 2 of the same or different substituents selected from the group consisting of fluorine, chloro, cyano, $C_{1-6}$ alkoxy, $C_{1-6}$ alkyl, $-CH_2OH$, and $-CH_2NR^4R^5$, and

$R^4$ and $R^5$ each independently, and if there are a plurality of instances of $R^4$ and $R^5$, they also independently represent a hydrogen atom, an optionally substituted $C_{3-6}$ alicyclic group, and optionally substituted $C_{1-6}$ alkyl, wherein $R^4$ and $R^5$, together with the nitrogen atom to which they are attached, may form a 4- to 10-membered nitrogen-containing non-aryl heterocycle (wherein the nitrogen-containing non-

aryl heterocycle is optionally substituted).

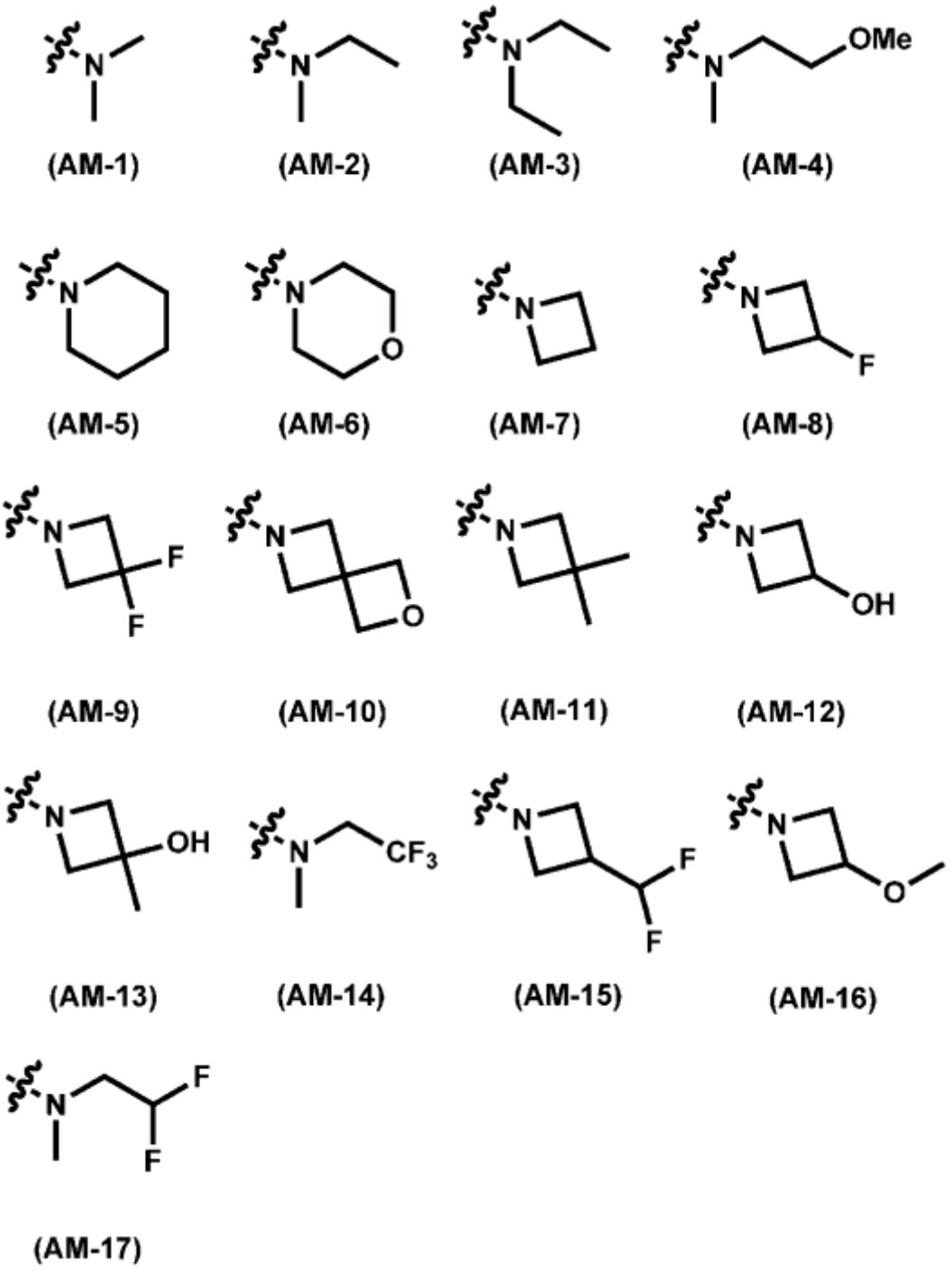
19. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 16 to 18, wherein $R^4$ and $R^5$ each independently, and if there are a plurality of instances of $R^4$ and $R^5$, they also independently represent a hydrogen atom, a $C_{3-6}$ alicyclic group, and $C_{1-6}$ alkyl (wherein the alicyclic group and the alkyl group are optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of halogen, hydroxy, a $C_{3-10}$ alicyclic group, $C_{1-6}$ alkoxy, a $C_{3-6}$ alicyclic oxy group, and a 4- to 6-membered non-aryl heterocyclic group), wherein $R^4$ and $R^5$, together with the nitrogen atom to which they are attached, may form a 4- to 10-membered nitrogen-containing non-aryl heterocycle (wherein the nitrogen-containing non-aryl heterocycle is optionally substituted with 1 to 5 of the same or different substituents selected from the group consisting of halogen, hydroxy, $C_{1-6}$ alkyl, and $C_{1-6}$ alkoxy).

20. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 16 to 18, wherein $R^4$ and $R^5$ are each independently, and if there are a plurality of instances of $R^4$ and $R^5$, they are also independently $C_{1-6}$ alkyl (wherein the alkyl group is optionally substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluorine, hydroxy, a $C_{3-7}$ alicyclic group, $C_{1-6}$ alkoxy, and a 4- to 6-membered non-aryl heterocyclic group), wherein $R^4$ and $R^5$, together with the nitrogen atom to which they are attached, may form a 4- to 7-membered nitrogen-containing non-aryl heterocycle.

21. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 16 to 18, wherein $-NR^4R^5$ is, and if there are a plurality of instances, they are each independently formula (AM-1), (AM-2), (AM-3), (AM-4),

(AM-5), (AM-6), (AM-7), (AM-8), (AM-9), (AM-10), (AM-11), (AM-12), (AM-13), (AM-14), (AM-15), (AM-16), or (AM-17):

[Chemical Formula 3]




.

22. The compound or the pharmaceutically acceptable salt

thereof according to claim 1, selected from the group consisting of the following compounds:
2-anilino-6-fluoro-3-phenylquinazolin-4(3H)-one,
2-anilino-6-fluoro-3-(5-methylpyridin-3-yl)quinazolin-4(3H)-one,
6-chloro-2-(2-chloro-4-fluoroanilino)-3-(pyridin-3-yl)quinazolin-4(3H)-one,
6-chloro-2-[4-(hydroxymethyl)anilino]-3-phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(dimethylamino)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-[3-(hydroxymethyl)anilino]-3-phenylquinazolin-4(3H)-one,
4-[(6-chloro-4-oxo-3-phenyl-3,4-dihydroquinazolin-2-yl)amino]benzonitrile,
3-[(6-chloro-4-oxo-3-phenyl-3,4-dihydroquinazolin-2-yl)amino]benzonitrile,
6-chloro-2-[3-(methanesulfonyl)anilino]-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(2-chloro-4-fluoroanilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(2,4-difluoroanilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(2-chloro-4-methoxyanilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(4-fluoro-2-methoxyanilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(2-fluoroanilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-3-phenyl-2-{4-[(piperidin-1-yl)methyl]anilino}quinazolin-4(3H)-one,
6-chloro-2-{4-[(morpholin-4-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
2-{4-[(azetidin-1-yl)methyl]anilino}-6-chloro-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(4-{[ethyl(methyl)amino]methyl}anilino)-3-

phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(diethylamino)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(4-{[(2-methoxyethyl)(methyl)amino]methyl}anilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(2-oxa-6-azaspiro[3.3]heptan-6-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(3,3-difluoroazetidin-1-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(3,3-dimethylazetidin-1-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(3-fluoroazetidin-1-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(4-{[3-(difluoromethyl)azetidin-1-yl]methyl}anilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-{4-[(3-methoxyazetidin-1-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(4-{[(2,2-difluoroethyl)(methyl)amino]methyl}anilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(3-fluoroanilino)-3-phenylquinazolin-4(3H)-one,
6-chloro-2-(4-chloroanilino)-3-phenylquinazolin-4(3H)-one,
2-anilino-6-chloro-3-phenylpyrido[3,4-d]pyrimidin-4(3H)-one,
6-chloro-2-(4-chloroanilino)-3-phenylpyrido[3,4-d]pyrimidin-4(3H)-one,
2-anilino-6-chloro-3-phenylpyrido[2,3-d]pyrimidin-4(3H)-one,
2-anilino-6-chloro-3-phenylpyrido[3,2-d]pyrimidin-4(3H)-one,
2-anilino-6-chloro-3-(pyridin-3-yl)quinazolin-4(3H)-one,
2-anilino-6-chloro-3-(pyridin-2-yl)quinazolin-4(3H)-one,
2-anilino-6-chloro-3-(pyridazin-3-yl)quinazolin-4(3H)-one,
2-anilino-6-chloro-3-(pyrazin-2-yl)quinazolin-4(3H)-one,
2-anilino-6-chloro-3-(pyridin-4-yl)quinazolin-4(3H)-one,
2-anilino-6-chloro-3-(pyrimidin-5-yl)quinazolin-4(3H)-one,
2-anilino-6-chloro-3-(5-fluoropyridin-2-yl)quinazolin-

4(3H)-one,
2-(2-chloroanilino)-6-fluoro-3-phenylquinazolin-4(3H)-one,
2-anilino-6,8-difluoro-3-phenylquinazolin-4(3H)-one,
6-fluoro-2-[4-(hydroxymethyl)anilino]-3-phenylquinazolin-4(3H)-one,
6-fluoro-3-phenyl-2-{4-[(piperidin-1-yl)methyl]anilino}quinazolin-4(3H)-one,
6-fluoro-2-{4-[(morpholin-4-yl)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
2-{4-[(azetidin-1-yl)methyl]anilino}-6-fluoro-3-phenylquinazolin-4(3H)-one,
2-(4-{[ethyl(methyl)amino]methyl}anilino)-6-fluoro-3-phenylquinazolin-4(3H)-one,
2-{4-[(diethylamino)methyl]anilino}-6-fluoro-3-phenylquinazolin-4(3H)-one,
6-fluoro-2-(4-{[(2-methoxyethyl)(methyl)amino]methyl}anilino)-3-phenylquinazolin-4(3H)-one,
2-{4-[(3,3-difluoroazetidin-1-yl)methyl]anilino}-6-fluoro-3-phenylquinazolin-4(3H)-one,
2-{4-[(3,3-dimethylazetidin-1-yl)methyl]anilino}-6-fluoro-3-phenylquinazolin-4(3H)-one,
2-anilino-6-(methoxymethyl)-3-phenylquinazolin-4(3H)-one,
2-anilino-6-methoxy-3-phenylquinazolin-4(3H)-one,
2-anilino-6-methyl-3-(pyridin-3-yl)quinazolin-4(3H)-one,
2-{3-[(dimethylamino)methyl]anilino}-3-phenylquinazolin-4(3H)-one,
6-fluoro-2-[3-(hydroxymethyl)anilino]-3-phenylquinazolin-4(3H)-one,
2-{3-[(azetidin-1-yl)methyl]anilino}-6-fluoro-3-phenylquinazolin-4(3H)-one,
6-ethyl-2-[4-(hydroxymethyl)anilino]-3-phenylquinazolin-4(3H)-one, and
6-chloro-2-(4-chloroanilino)-3-phenylpyrido[2,3-d]pyrimidin-4(3H)-one.

23. A medicament comprising the compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22 as an active ingredient.

24. The medicament according to claim 23, which is a therapeutic drug or a prophylactic drug for epilepsy or amyotrophic lateral sclerosis.

25. The medicament according to claim 23, which is a therapeutic drug or a prophylactic drug for amyotrophic lateral sclerosis.

26. A nerve hyperexcitation suppressing agent comprising the compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22 as an active ingredient.

27. A pharmaceutical composition comprising the compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22.

28. The pharmaceutical composition according to claim 27, which is a therapeutic drug or a prophylactic drug for epilepsy or amyotrophic lateral sclerosis.

29. Use of the compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22 for the manufacture of a therapeutic agent for epilepsy or amyotrophic lateral sclerosis.

30. The compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22 for use in the treatment of epilepsy or amyotrophic lateral sclerosis.

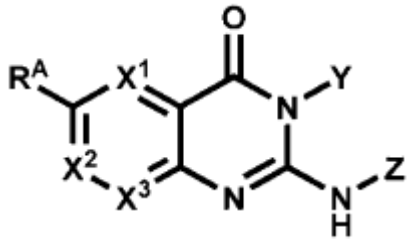
31. A pharmaceutical composition comprised of the compound

or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22 in combination with at least one agent selected from agents classified as an antiepileptic drug, an anti-amyotrophic lateral sclerosis drug, an antioxidant, or an anti-inflammatory drug.

32. A pharmaceutical composition comprising the compound or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 22 for the treatment of epilepsy or amyotrophic lateral sclerosis used concomitantly with at least one agent selected from agents classified as an antiepileptic drug, an anti-amyotrophic lateral sclerosis drug, an antioxidant, or an anti-inflammatory drug.

33. A medicament, which is a therapeutic drug or a prophylactic drug for epilepsy or amyotrophic lateral sclerosis, comprising, as an active ingredient, a compound represented by

[Chemical Formula 4]



(1)

or a pharmaceutically acceptable salt thereof,

wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

Y represents optionally substituted $C_{6-10}$ aryl or

optionally substituted 6- to 10-membered heteroaryl,

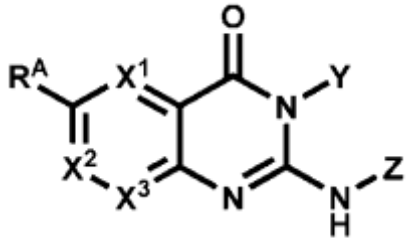
Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy.

34. The medicament according to claim 33, which is a therapeutic drug or a prophylactic drug for amyotrophic lateral sclerosis.

35. A nerve hyperexcitation suppressing agent comprising, as an active ingredient, a compound represented by
[Chemical Formula 5]



(1)

or a pharmaceutically acceptable salt thereof,
wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

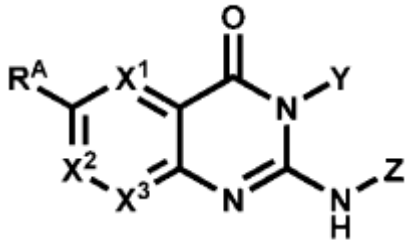
Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy.

36. A pharmaceutical composition, which is a therapeutic drug or a prophylactic drug for epilepsy or amyotrophic lateral sclerosis, comprising a compound represented by [Chemical Formula 6]



(1)

or a pharmaceutically acceptable salt thereof,
wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

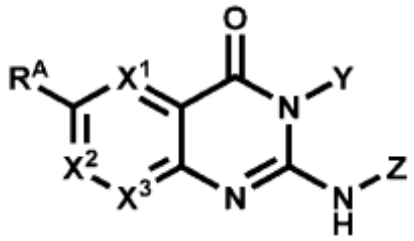
Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or

optionally substituted $C_{1-6}$ alkoxy.

37. Use of a compound represented by
[Chemical Formula 8]



(1)

or a pharmaceutically acceptable salt thereof,
wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

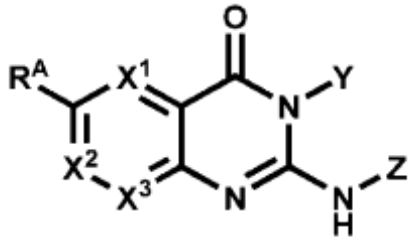
Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, for the manufacture of a therapeutic agent for epilepsy or amyotrophic lateral sclerosis.

38. A compound represented by
[Chemical Formula 9]



(1)

or a pharmaceutically acceptable salt thereof,

wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

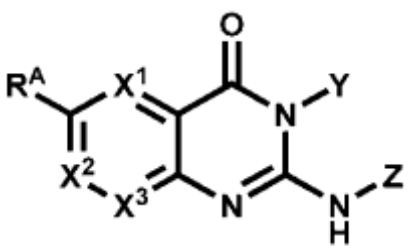
Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, for use in the treatment of epilepsy or amyotrophic lateral sclerosis.

39. A medicament comprised of a compound represented by [Chemical Formula 10]



(1)

or a pharmaceutically acceptable salt thereof,
wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N,

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

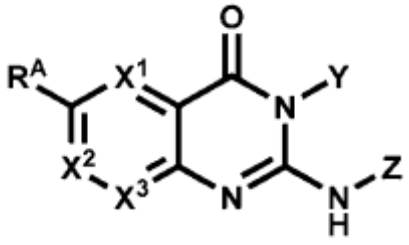
Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, in combination with at least one agent selected from agents classified as an antiepileptic drug, an anti-amyotrophic lateral sclerosis drug, an antioxidant, or an anti-inflammatory drug.

40. A pharmaceutical composition comprising a compound represented by
[Chemical Formula 11]



(1)

or a pharmaceutically acceptable salt thereof,
wherein,

$X^1$ represents $CR^1$ or N,

$X^2$ represents $CR^2$ or N, and

$X^3$ represents $CR^3$ or N,

wherein (1) if $X^1$ is N, then $X^2$ is $CR^2$, and $X^3$ is $CR^3$, (2) if $X^2$ is N, then $X^1$ is $CR^1$, and $X^3$ is $CR^3$, and (3) if $X^3$ is N, then $X^1$ is $CR^1$, and $X^2$ is $CR^2$,

Y represents optionally substituted $C_{6-10}$ aryl or optionally substituted 6- to 10-membered heteroaryl,

Z represents optionally substituted $C_{6-10}$ aryl,

$R^A$ represents a hydrogen atom, halogen, cyano, optionally substituted $C_{1-6}$ alkylsulfonyl, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, and

$R^1$, $R^2$, and $R^3$ each independently represent a hydrogen atom, halogen, optionally substituted $C_{1-6}$ alkyl, or optionally substituted $C_{1-6}$ alkoxy, for treating epilepsy or amyotrophic lateral sclerosis in concomitant use with at least one agent selected from agents classified as an antiepileptic drug, an anti-amyotrophic lateral sclerosis drug, an antioxidant, or an anti-inflammatory drug.