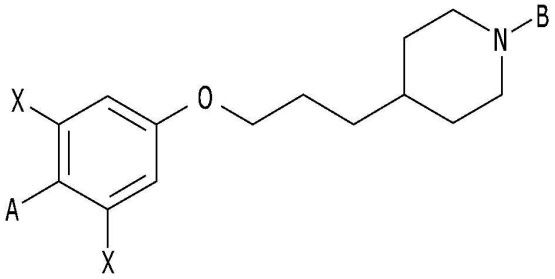
CLAIMS

1. A pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease, comprising:

a compound represented by a following chemical Formula 1, pharmaceutically acceptable salts thereof, optical isomers thereof, hydrates thereof, solvates thereof or mixtures thereof; and

at least one selected from a PPAR agonist, a DPPIV inhibitor, an ACC inhibitor, a FXR agonist and a CCR2/5 dual antagonist:

[Formula 1]



wherein in above Formula 1,

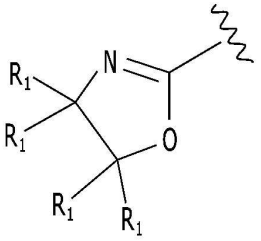
A is an oxadiazole group, a dihydrooxazole group, a thiazole group or a thiadiazole group, in which above A is unsubstituted or substituted with at least one substituent selected from the group consisting of a halogen atom, a C1-C6 straight or branched chain alkyl group, and a C1-C6 straight or branched chain hydroxyalkyl group, in which the alkyl group or the hydroxyalkyl group is each independently unsubstituted or substituted with a halogen atom or a C1-C6 alkoxy group;

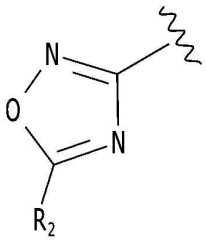
B is a pyridine group, a pyrimidine group, a pyrazine group or an oxadiazole group, in which above B is unsubstituted or substituted with at least one substituent selected from the group consisting of a halogen atom, a C1-C6 straight or branched chain alkyl group, a C1-C6 straight or branched chain hydroxyalkyl group, a C1-C6 alkoxy group and an oxadiazole group, in which the C1-C6 straight or branched chain

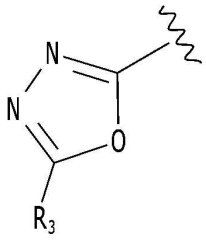
alkyl group, the C1-C6 straight or branched chain hydroxyalkyl group, the C1-C6 alkoxy group or the oxadiazole group is each independently unsubstituted or substituted with halogen, a C1-C6 alkyl group or a C1-C6 alkoxy group; and

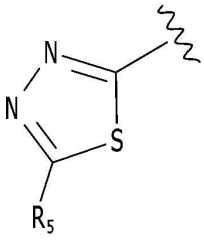
X is F, Cl, Br or I.

2. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein above A is

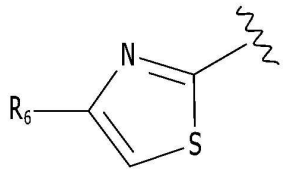


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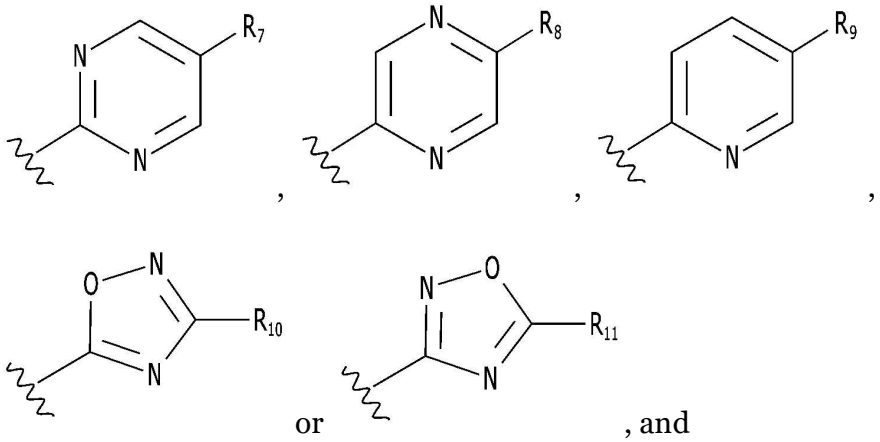
or



, and

R1 to R3, R5 and R6 are each independently at least one substituent selected from the group consisting of a hydrogen atom, a halogen atom, a C1-C6 straight or branched chain alkyl group and a C1-C6 straight or branched chain hydroxyalkyl group, in which the alkyl group or the hydroxyalkyl group is each independently unsubstituted or substituted with a halogen atom or a C1-C6 alkoxy group.

3. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according toclaim 1, wherein above B is



, and

R_7 to R_{11} are each independently substituted with at least one substituent selected from the group consisting of a hydrogen atom, a halogen atom, a C1-C6 straight or branched chain alkyl group, a C1-C6 straight or branched chain hydroxyalkyl group, a C1-C6 alkoxy group and an oxadiazole group, in which the alkyl group, the hydroxyalkyl group, the alkoxy group or the oxadiazole group is each independently unsubstituted or substituted with a halogen atom, a C1-C6 alkyl group or a C1-C6 alkoxy group.

4. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein X is F.

5. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein above A is an oxadiazole group substituted with a C1-C6 straight or branched chain alkyl group, above B is a pyrimidine group substituted with a C1-C6 straight or branched chain alkyl group, and X is F.

6. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein the compound represented by above formula 1 is 3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,2,4-oxadiazole.

7. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 6, wherein the pharmaceutical composition comprises the PPAR agonist, the DPPIV inhibitor, the ACC inhibitor, the FXR agonist and the CCR2/5 antagonist.

8. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 6, wherein the pharmaceutical composition comprises at least one of elafibranor, evogliptin, sitagliptin, firsocostat, obeticholic acid and cenicriviroc.

9. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 7, wherein the PPAR agonist is elafibranor.

10. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 7, wherein the DPPIV inhibitor is at least one of evogliptin and sitagliptin.

11. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 7, wherein the ACC inhibitor is firsocostat.

12. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 7, wherein the FXR agonist is obeticholic acid.

13. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 7, wherein the CCR2/5 antagonist is cenicriviroc.

14. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein the nonalcoholic fatty liver disease is selected from the group consisting of simple fatty liver, nonalcoholic steatohepatitis, liver fibrosis and cirrhosis.

15. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein the pharmaceutical composition inhibits deposition of triglycerides in liver tissues.

16. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein the pharmaceutical composition inhibits occurrence of inflammation in liver tissues.

17. The pharmaceutical composition for use in preventing or treating nonalcoholic fatty liver disease according to claim 1, wherein the pharmaceutical composition inhibits fibrosis of liver tissues.

18. Use of a pharmaceutical composition, comprising:

the compound represented by the chemical Formula 1 according to claim 1, pharmaceutically acceptable salts thereof, optical isomers thereof, hydrates thereof, solvates thereof, or mixtures thereof; and

at least one selected from a PPAR agonist, a DPPIV inhibitor, an ACC inhibitor, a FXR agonist and a CCR2/5 dual antagonist as an active ingredient in the manufacture of a medicament for preventing or treating nonalcoholic fatty liver disease.