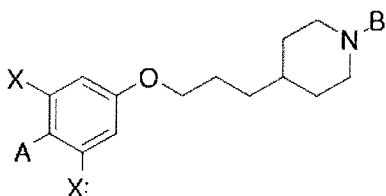


CLAIMS

1. A compound represented by following Chemical Formula 1, an optical isomer, a diastereomer or a racemate thereof, or a pharmaceutically acceptable salt thereof:

[Chemical Formula 1]



wherein

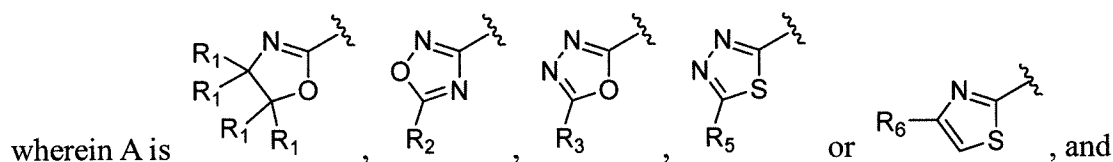
A is oxadiazole, dihydrooxazole, thiazole or thiadiazole, optionally substituted by one or more substituents selected from the group consisting of hydrogen, halogen, C1-C6 straight chain or branched chain alkyl and C1-C6 alcohol, the C1-C6 straight chain or branched alkyl or C1-C6 alcohol group being optionally substituted by hydrogen, halogen or a C1-C6 alkoxy group;

B is pyridine, pyrimidine, pyrazine or oxadiazole, optionally substituted by one or more substituents selected from the group consisting of hydrogen, halogen, C1-C6 straight chain or branched chain alkyl, C1-C6 alcohol, C1-C6 alkoxy and oxadiazole groups, the C1-C6 straight chain or branched alkyl, C1-C6 alcohol, C1-C6 alkoxy or oxadiazole group being optionally substituted by hydrogen, halogen, C1-C6 alkyl or C1-C6 alkoxy group; and

X is independently F, Cl, Br or I.

2. The compound of claim 1, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof, wherein in the Chemical Formula 1, A is dihydrooxazole, thiazole or thiadiazole; and B is pyrimidine, pyridine or oxadiazole.
3. The compound of claim 1, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof, wherein in A is oxadiazole; and B is pyridine, pyrimidine, pyrazine or oxadiazole.

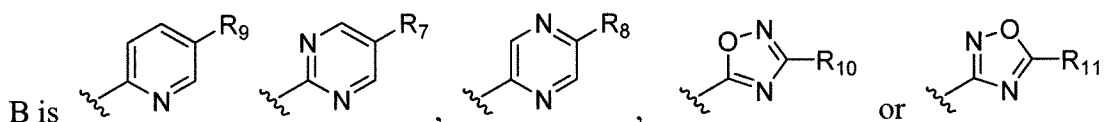
4. The compound of claim 1, the isomer thereof, or the pharmaceutically acceptable salt thereof,



R_1 to R_3 , R_5 and R_6 are independently one or more substituents selected from the group consisting of hydrogen, halogen, C1-C6 straight chain or branched chain alkyl and C1-C6 alcohol, the alkyl or alcohol group being optionally substituted by hydrogen, halogen or a C1-C6 alkoxy group.

5. The compound of claim 1, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof,

wherein



R_7 to R_{11} are optionally substituted by one or more substituents selected from the group consisting of hydrogen, halogen, C1-C6 straight chain or branched chain alkyl, C1-C6 alcohol, C1-C6 alkoxy and oxadiazole groups, the C1-C6 straight chain or branched alkyl, C1-C6 alcohol, C1-C6 alkoxy or oxadiazole group being optionally substituted by hydrogen, halogen, C1-C6 alkyl or C1-C6 alkoxy group.

6. The compound of claim 1, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof, wherein X is fluoro; or the isomer thereof.

7. The compound of claim 1, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof, wherein A is oxadiazole substituted by C1-C6 straight chain or branched chain alkyl; B is pyrimidine substituted by C1-C6 straight chain or branched chain alkyl; and X is F.

8. The compound of claim 1, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof, wherein it is selected from the group consisting of the following compounds:

- 2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-4,5-dihydrooxazole,
- (R)-2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-4-methyl-4,5-dihydrooxazole,
- (S)-2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-4-methyl-4,5-dihydrooxazole,
- (S)-2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-methyl-4,5-dihydrooxazole,
- (R)-2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-methyl-4,5-dihydrooxazole,
- 2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5,5-dimethyl-4,5-dihydrooxazole,
- (R)-(2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-4,5-dihydrooxazol-5-yl)methanol,
- (S)-(2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-4,5-dihydrooxazol-5-yl)methanol,
- (R)-3-(2-(4-(3-(3,5-difluoro-4-(5-methyl-4,5-dihydrooxazol-2-yl)phenoxy)propyl)piperidin-1-yl)pyrimidin-5-yl)-5-isobutyl-1,2,4-oxadiazole,
- (R)-5-(4-(3-(3,5-difluoro-4-(4-methyl-4,5-dihydrooxazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-isopropyl-1,2,4-oxadiazole,
- (S)-5-(4-(3-(3,5-difluoro-4-(5-methyl-4,5-dihydrooxazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-isopropyl-1,2,4-oxadiazole,
- 5-(4-(3-(4-(5,5-dimethyl-4,5-dihydrooxazol-2-yl)-3,5-difluorophenoxy)propyl)piperidin-1-yl)-3-isopropyl-1,2,4-oxadiazole,
- 3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-methyl-1,2,4-oxadiazole,
- 3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-propyl-1,2,4-oxadiazole,

3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,2,4-oxadiazole,

5-(tert-butyl)-3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazole,

(3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazol-5-yl)methanol,

2-(3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazol-5-yl)ethan-1-ol,

(S)-1-(3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazol-5-yl)propan-1-ol,

(R)-1-(3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazol-5-yl)propan-2-ol,

(S)-1-(3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazol-5-yl)propan-2-ol,

2-(3-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,2,4-oxadiazol-5-yl)-2-methylpropan-1-ol,

3-(2,6-difluoro-4-(3-(1-(5-propylpyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(2,6-difluoro-4-(3-(1-(5-pentylpyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(2,6-difluoro-4-(3-(1-(5-methoxypyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(2,6-difluoro-4-(3-(1-(5-isopropoxypyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(4-(3-(1-(5-chloropyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(4-(3-(1-(5-bromopyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,2,4-oxadiazole,

3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-methyl-1,2,4-oxadiazole,

3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-

4-yl)propoxy)phenyl)-5-ethyl-1,2,4-oxadiazole,
 3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,
 5-(sec-butyl)-3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-1,2,4-oxadiazole,
 3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-(methoxymethyl)-1,2,4-oxadiazole,
 (S)-1-(3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-1,2,4-oxadiazol-5-yl)propan-1-ol,
 2-(3-(2,6-difluoro-4-(3-(1-(5-(5-isobutyl-1,2,4-oxadiazol-3-yl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-1,2,4-oxadiazol-5-yl)-2-methylpropan-1-ol,
 3-(4-(3-(1-(5-chloropyrazin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,2,4-oxadiazole,
 3-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyridin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,
 3-(2,6-difluoro-4-(3-(1-(3-isopropyl-1,2,4-oxadiazol-5-yl)piperidin-4-yl)propoxy)phenyl)-5-methyl-1,2,4-oxadiazole,
 3-(2,6-difluoro-4-(3-(1-(3-isopropyl-1,2,4-oxadiazol-5-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,2,4-oxadiazole,
 (3-(2,6-difluoro-4-(3-(1-(3-isopropyl-1,2,4-oxadiazol-5-yl)piperidin-4-yl)propoxy)phenyl)-1,2,4-oxadiazol-5-yl)methanol,
 2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-methyl-1,3,4-oxadiazole,
 2-ethyl-5-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-1,3,4-oxadiazole,
 2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,3,4-oxadiazole,
 5-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-N-isopropyl-1,3,4-oxadiazol-2-amine,
 2-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-methyl-1,3,4-oxadiazole,
 2-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-ethyl-1,3,4-oxadiazole,

2-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,3,4-oxadiazole,

2-(4-(3-(1-(5-chloropyrazin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-methyl-1,3,4-oxadiazole,

2-(4-(3-(1-(5-chloropyrazin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-ethyl-1,3,4-oxadiazole,

2-(4-(3-(1-(5-chloropyrazin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,3,4-oxadiazole,

5-(4-(3-(3,5-difluoro-4-(5-methyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-propyl-1,2,4-oxadiazole,

5-(4-(3-(3,5-difluoro-4-(5-ethyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-propyl-1,2,4-oxadiazole,

5-(4-(3-(3,5-difluoro-4-(5-isopropyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-propyl-1,2,4-oxadiazole,

5-(4-(3-(3,5-difluoro-4-(5-methyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-isopropyl-1,2,4-oxadiazole,

5-(4-(3-(4-(5-ethyl-1,3,4-oxadiazol-2-yl)-3,5-difluorophenoxy)propyl)piperidin-1-yl)-3-isopropyl-1,2,4-oxadiazole,

5-(4-(3-(3,5-difluoro-4-(5-isopropyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-isopropyl-1,2,4-oxadiazole,

5-(4-(3-(3,5-difluoro-4-(5-methyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-3-(2,2,2-trifluoroethyl)-1,2,4-oxadiazole,

3-(4-(3-(3,5-difluoro-4-(5-isopropyl-1,3,4-oxadiazol-2-yl)phenoxy)propyl)piperidin-1-yl)-5-isopropyl-1,2,4-oxadiazole,

2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)-5-isopropyl-1,3,4-thiadiazole,

2-(2,6-difluoro-4-(3-(1-(5-propylpyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,3,4-thiadiazole,

2-(2,6-difluoro-4-(3-(1-(5-pentylpyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,3,4-thiadiazole,

2-(2,6-difluoro-4-(3-(1-(5-fluoropyrimidin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,3,4-thiadiazole,

2-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyrimidin-2-yl)piperidin-4-

yl)propoxy)phenyl)-5-isopropyl-1,3,4-thiadiazole,

2-(2,6-difluoro-4-(3-(1-(5-(trifluoromethyl)pyridin-2-yl)piperidin-4-yl)propoxy)phenyl)-5-isopropyl-1,3,4-thiadiazole and

4-ethyl-2-(4-(3-(1-(5-ethylpyrimidin-2-yl)piperidin-4-yl)propoxy)-2,6-difluorophenyl)thiazole.

9. A pharmaceutical composition for treatment or prevention of a metabolic disease comprising the compound of any one of claims 1 to 8, the optical isomer, the diastereomer or the racemate thereof, or the pharmaceutically acceptable salt thereof.

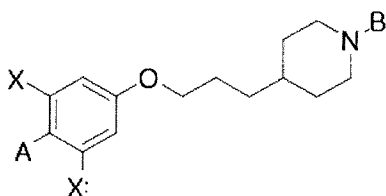
10. The pharmaceutical composition of claim 9, wherein the metabolic disease is selected from the group consisting of diabetes, obesity, hypertension, a cardiovascular disease, a hemostatic disorder and dyslipidemia.

11. A method for preparing a compound represented by following Chemical Formula 1, comprising:

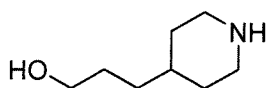
introducing a B group to a nitrogen group of piperidine of a compound of following Chemical Formula 2 to prepare a compound of following Chemical Formula 4; and

introducing a compound of following Chemical Formula 12 to a hydroxyl group of the compound of the Chemical Formula 4:

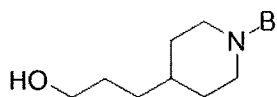
[Chemical Formula 1]



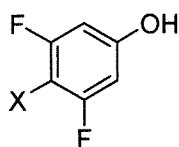
[Chemical Formula 2]



[Chemical Formula 4]



[Chemical Formula 12]



wherein

A is oxadiazole, dihydrooxazole, thiazole or thiadiazole, optionally substituted by one or more substituents selected from the group consisting of hydrogen, halogen, C1-C6 straight chain or branched chain alkyl and C1-C6 alcohol, the C1-C6 straight chain or branched alkyl or C1-C6 alcohol group being optionally substituted by hydrogen, halogen or a C1-C6 alkoxy group;

B is pyridine, pyrimidine, pyrazine or oxadiazole, optionally substituted by one or more substituents selected from the group consisting of hydrogen, halogen, C1-C6 straight chain or branched chain alkyl, C1-C6 alcohol, C1-C6 alkoxy and oxadiazole, the C1-C6 straight chain or branched alkyl, C1-C6 alcohol, C1-C6 alkoxy or oxadiazole group being optionally substituted by hydrogen, halogen, C1-C6 alkyl or C1-C6 alkoxy group; and

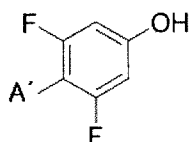
X is independently F, Cl, Br or I.

12. The method of claim 11, wherein the introducing of a compound of Chemical Formula 12 to a hydroxyl group of the compound of the Chemical Formula 4 comprises:

reacting the compound of the Chemical Formula 4 and a compound of following Chemical Formula 12a; and

converting A' into A:

[Chemical Formula 12a]



wherein

A' is a cyano group, a carboxyl group, an ester group, a ketone group or halogen.

13. The method of claim 12, wherein the reacting of the compound of the Chemical Formula 4 and a compound of Chemical Formula 12a comprises:

introducing a methane sulfonyl group to the hydroxyl group of the compound of the Chemical Formula 4; and

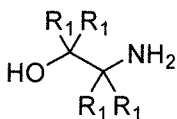
reacting the compound of the Chemical Formula 4 having the methane sulfonyl group introduced thereto with the compound of the Chemical Formula 12a.

14. The method of claim 12, wherein the converting of A' into A comprises:

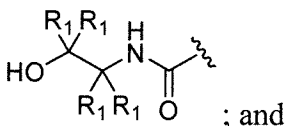
converting A' to carboxylic acid;

reacting the carboxylic acid and aminoethanol of following Chemical Formula 13 to introduce a compound of following Chemical Formula 14 to A' of the Chemical Formula 12a:

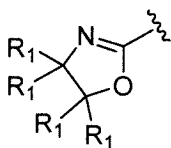
[Chemical Formula 13]



[Chemical Formula 14]



cyclizing a compound prepared in a previous step to form a compound wherein A is

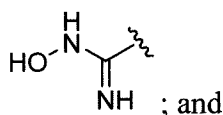


, wherein R₁ is independently one or more substituent selected from the group consisting of hydrogen, halogen, C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol, the C1 to C6 straight chain or branched chain alkyl or C1 to C6 alcohol is optionally substituted by hydrogen, hydrogen or C1 to C6 alkoxy C1 to C6 alkyl.

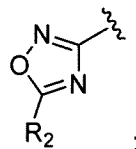
15. The method of claim 12, wherein the converting of A' into A comprises:

when A' is a cyano group, reacting A' with hydroxylamine to introduce a compound of following Chemical Formula 15 to A' of the Chemical Formula 12a:

[Chemical Formula 15]

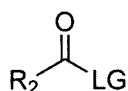


reacting a compound prepared in a previous step and a compound of following



Chemical Formula 16 to form a compound wherein A is :

[Chemical Formula 16]



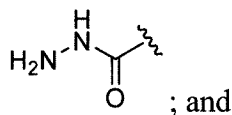
wherein

R₂ is one or more substituent selected from the group consisting of H, halogen, C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol, the C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol is optionally substituted by hydrogen, halogen or or C1 to C6 alkoxy; and

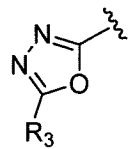
LG is a leaving group.

16. The method of claim 12, wherein the converting of A' into A comprises:
 converting A' to prepare carboxylic acid;
 reacting the carboxylic acid and hydrazine to introduce a compound of following
 Chemical Formula 17 to A' of the Chemical Formula 12a:

[Chemical Formula 17]

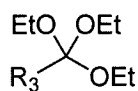


reacting a compound prepared in a previous step with a compound of following

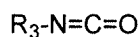


Chemical Formula 18 or 19 to form a compound wherein A is :

[Chemical Formula 18]



[Chemical Formula 19]

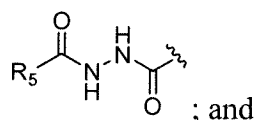


wherein

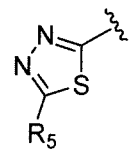
R_3 is one or more substituent selected from the group consisting of hydrogen, halogen, C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol, the C1 to C6 straight chain or branched chain alkyl or C1 to C6 alcohol is optionally substituted by hydrogen, hydrogen or C1 to C6 alkoxy.

17. The method of claim 12, wherein the converting of A' to A comprises:
 converting A' to prepare carboxylic acid, if A' is a carboxyl group or an ester group;
 reacting the carboxylic acid with hydrazine or hydrazide to introduce a compound of
 following Chemical Formula 20 to A' of the Chemical Formula 12a:

[Chemical Formula 20]

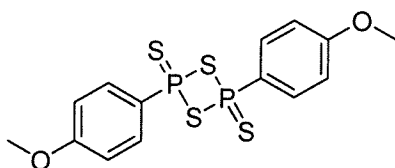


reacting a compound prepared in a previous step with a compound of following



Chemical Formula 21 to form a compound wherein A is :

[Chemical Formula 21]



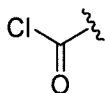
wherein

R_5 is one or more substituent selected from the group consisting of hydrogen, halogen, C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol, the C1 to C6 straight chain or branched chain alkyl or C1 to C6 alcohol is optionally substituted by hydrogen, hydrogen or C1 to C6 alkoxy.

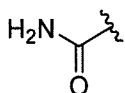
18. The method of claim 12, wherein the converting of A' to A comprises:
 converting-A' to prepare carboxylic acid;

inducing the structure of Chemical Formula 24 into A' of the compound of Formula 12 a by converting the carboxylic acid to the structure of Chemical Formula 22, an amide structure of Chemical Formula 23 and the structure of Chemical Formula 24, sequentially, and

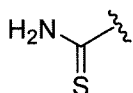
[Chemical Formula 22]



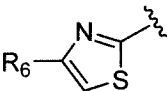
[Chemical Formula 23]



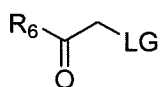
[Chemical Formula 24]



reacting the compound prepared above with a compound of Chemical Formula 25 to

form a compound wherein A is  :

[Chemical Formula 25]



Wherein

LG is a leaving group; and

R_6 is one or more substituent selected from the group consisting of H, halogen, C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol, the C1 to C6 straight chain or branched chain alkyl and C1 to C6 alcohol is optionally substituted by hydrogen, halogen or or C1 to C6 alkoxy.