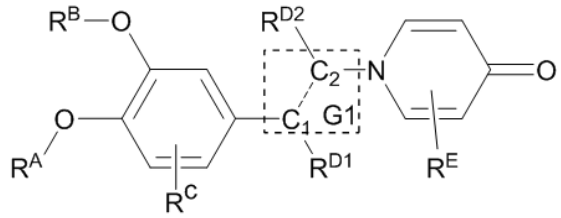
CLAIMS

WHAT IS CLAIMED IS:

1. An anti-inflammatory compound, which is a compound having a structure shown below:



wherein R^A is hydrogen, alkyl, or aryl, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, cycloalkyl, aryl, or halogen;

R^B is hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl, alkenyl, or alkynyl, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, cycloalkyl, heterocycloalkyl, aryl, or halogen, and one or more carbon atom(s) in the groups is/are optionally substituted with sulfur, sulfoxide, sulfone, or sulfonyl; or R^B is a hydroxyl protecting group;

R^C is hydrogen, alkyl, halogen, alkoxy, or cyano;

R^{D1} is hydrogen, oxygen, nitrogen, hydroxy, cyano, amino, amido, alkyl, aryl, an ester group, carboxyl, alkenyl, or alkynyl, and in the above groups one or more hydrogen atom(s) attached to carbon/oxygen/nitrogen in the groups is/are optionally substituted with alkyl, cycloalkyl, alkynyl, alkenyl, aryl, halogen, sulfonyl, a sulfoxide group, or an ether group, and one or more carbon atom(s) in the groups is/are optionally substituted with sulfur, sulfoxide, sulfone, or sulfonyl;

C_1-R^{D1} bond is a single bond or a double bond;

R^{D2} is hydrogen, cyano, alkyl, cycloalkyl, aryl, an ester group, or carboxyl, and in the above groups one or more hydrogen atom(s) attached to carbon/oxygen/nitrogen in the group is/are optionally substituted with alkyl, cycloalkyl, alkynyl, alkenyl, aryl, halogen, sulfonyl, a

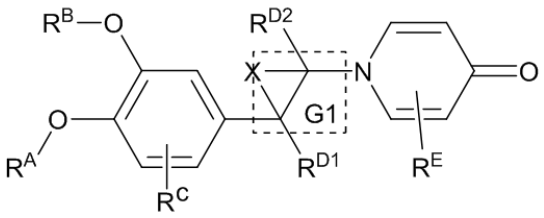
sulfoxide group, or an ether group;

G1 is a single bond, a double bond or a ring, that comprises C_1 and C_2; and

R^E is a group where one or more hydrogen atom(s) attached to carbon is/are substituted with alkyl, aryl, cyano, or halogen.

2. The anti-inflammatory compound according to claim 1, wherein

G1 is a three-membered ring having a specific structure shown below:



in which X is carbon, oxygen, nitrogen, or sulfur.

3. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

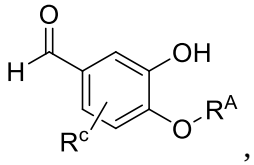
using a 3-hydroxybenzaldehyde derivative A as a starting material, and substituting the hydrogen in the hydroxyl group of the 3-hydroxybenzaldehyde derivative A with R^B to obtain an intermediate product B;

reacting the intermediate product B with trimethylsilyl cyanide to obtain an intermediate product C;

reducing the intermediate product C to obtain an intermediate product D having an amino group; and

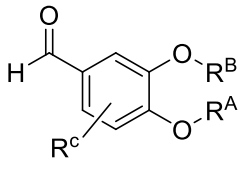
reacting the amino group in the intermediate product D with a six-membered oxygen-containing cyclic compound to obtain a type-A target product,

wherein the 3-hydroxybenzaldehyde derivative A is a compound having a structure shown below:



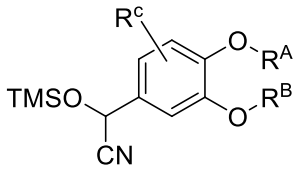
,

the intermediate product B is a compound having a structure shown below:



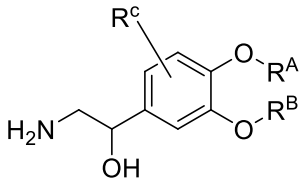
,

the intermediate product C is a compound having a structure shown below:



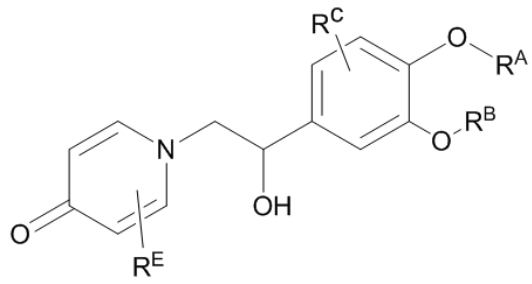
,

the intermediate product D is a compound having a structure shown below:



, and

the type-A target product is a compound having a structure shown below:

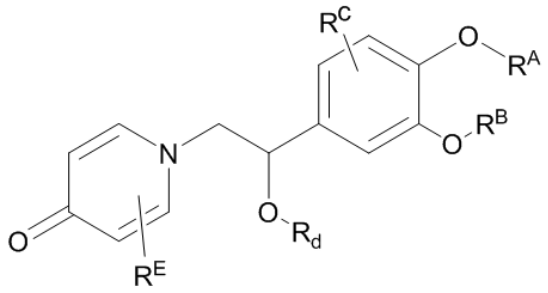


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4. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

subjecting the hydroxyl group on the middle bridge of the type-A target product according to claim 3 to an addition/substitution reaction to obtain a type-A-1 target product,

wherein the type-A-1 target product is a compound having a structure shown below:

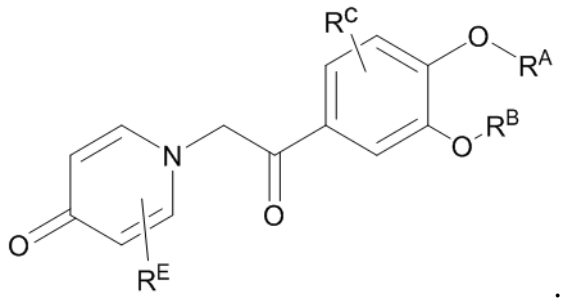


in which R_d is alkyl, cycloalkyl, or an ester group, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, alkynyl, alkenyl, cycloalkyl, aryl, halogen, hydroxy, thio, cyano, or thioalkyl.

5. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

oxidizing the hydroxyl group on the middle bridge of the type-A target product according to claim 3 to obtain a type-B target product,

wherein the type-B target product is a compound having a structure shown below:

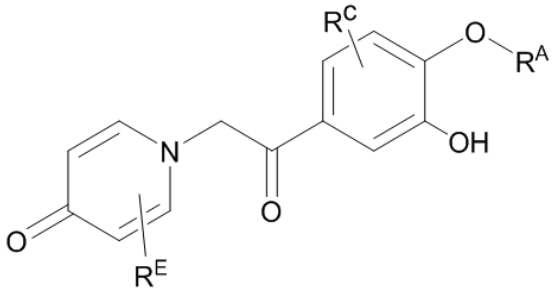


.

6. The method for preparing the anti-inflammatory compound according to claim 5, comprising:

deprotecting the group R^B that is a hydroxyl protecting group on the type-B target product to obtain a type-B-1 target product,

wherein the type-B-1 target product is a compound having a structure shown below:

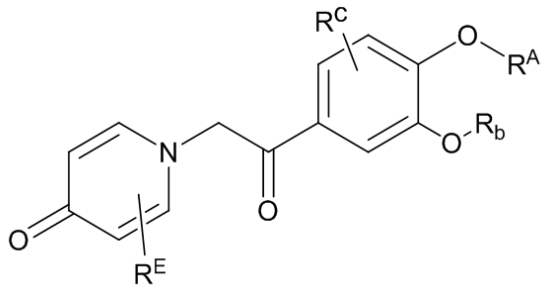


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7. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

subjecting the hydroxyl group on the benzene ring of the type-B-1 target product according to claim 6 to an addition/substitution reaction to obtain a type-B-2 target product,

wherein the type-B-2 target product is a compound having a structure shown below:



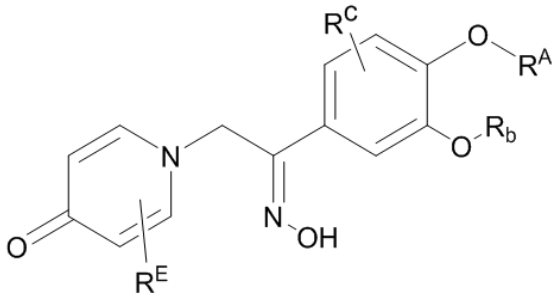
,

in which R_b is alkyl, cycloalkyl, or an ester group, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, alkynyl, alkenyl, cycloalkyl, aryl, halogen, hydroxy, thio, cyano, or thioalkyl.

8. A method for preparing an anti-inflammatory compound according to claim 1, comprising:

oximating the carbonyl group on the middle bridge of the type-B target product according to claim 5 to obtain a type-B-3 target product,

wherein the type-B-3 target product is a compound having a structure shown below:

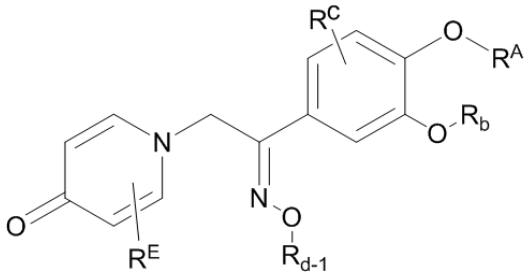


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9. A method for preparing an anti-inflammatory compound according to claim 1, comprising:

subjecting the hydroxyl group on the oxime of the type-B-3 target product according to claim 8 to an addition/substitution reaction to obtain a type-B-4 target product,

wherein the type-B-4 target product is a compound having a structure shown below:



,

in which R_{d-1} is alkyl, cycloalkyl, or an ester group, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, alkynyl, alkenyl, cycloalkyl, aryl, halogen, hydroxy, thio, cyano, or thioalkyl.

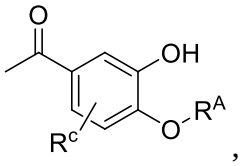
10. The method for preparing the anti-inflammatory compound according to claim 5, comprising:

using a 3-hydroxyacetophenone derivative I as a starting material, and substituting the hydrogen in the hydroxyl group of the 3-hydroxyacetophenone derivative I with R^B to obtain an intermediate product II;

reacting the intermediate product II in the presence of a halogenating agent to obtain an intermediate product III; and

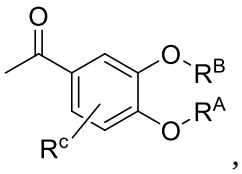
reacting the halogen of the intermediate product III with a six-membered oxygen-containing cyclic compound to obtain the type-B target product,

wherein the 3-hydroxyacetophenone derivative I is a compound having a structure shown below:



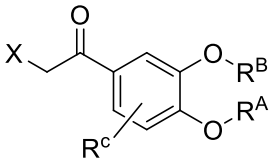
,

the intermediate product II is a compound having a structure shown below:



, and

the intermediate product III is a compound having a structure shown below:



, in which X is halogen.

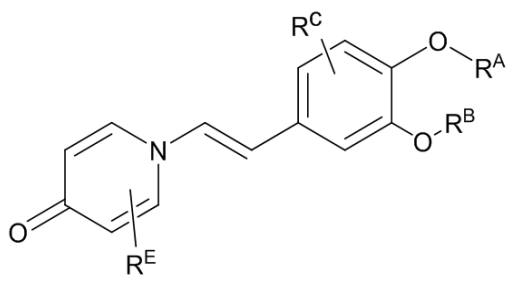
11. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

removing the hydroxyl group on the middle bridge of the type-A target product according to claim 3 to obtain a type-C target product,

or

reducing and then eliminating the carbonyl group on the middle bridge of the type-B target product according to claim 5 to obtain a type-C target product,

wherein the type-C target product is a compound having a structure shown below:



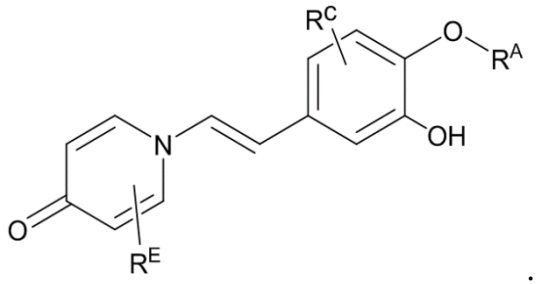
.

12. A method for preparing the anti-inflammatory compound according to claim 1,

comprising:

reducing and then eliminating the carbonyl group on the middle bridge of the type-B-2 target product according to claim 7 to obtain a type-C-1 target product,

wherein the type-C-1 target product is a compound having a structure shown below:

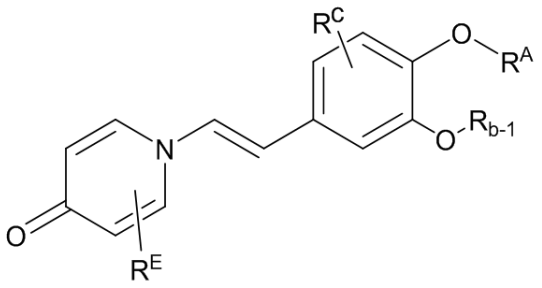


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13. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

subjecting the hydroxyl group on the phenyl ring of the type-C-1 target product according to claim 12 to an addition/substitution reaction to obtain a type-C-2 target product,

wherein the type-C-2 target product is a compound having a structure shown below:



,

in which R_{b-1} is alkyl, cycloalkyl, or an ester group, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, alkynyl, alkenyl, cycloalkyl, aryl, halogen, hydroxy, thio, cyano, or thioalkyl.

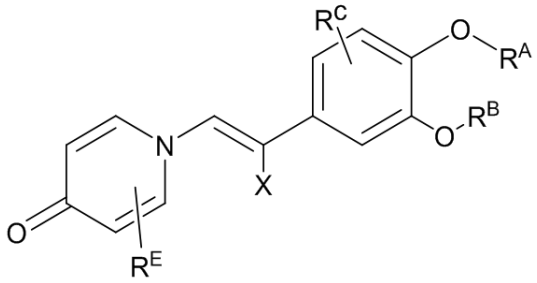
14. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

reacting the carbonyl group on the middle bridge of the type-B target product according to claim 5 with a halogenating reagent to obtain an intermediate product X1, and

replacing the halogen in the intermediate product X1 to obtain a type-C-3 target

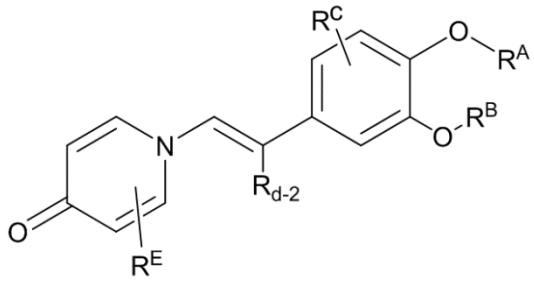
product,

wherein the intermediate product X1 is a compound having a structure shown below:



, in which X is halogen; and

the type-C-3 target product is a compound having a structure shown below:



,

in which R_{d-2} is aryl, alkyl, cycloalkyl, an ether group, or an ester group, and in the above groups one or more hydrogen atom(s) attached to carbon in the group is/are optionally substituted with alkyl, alkynyl, alkenyl, cycloalkyl, aryl, halogen, hydroxy, thio, cyano, or thioalkyl.

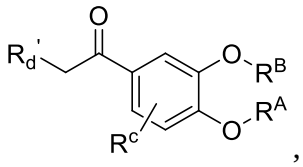
15. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

reacting an acetophenone derivative 1 as a starting material with trimethylsilyl cyanide, to obtain an intermediate product 2;

reducing the intermediate product 2 to obtain an intermediate product 3; and

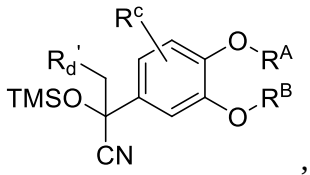
reacting the amino group in the intermediate product 3 with a six-membered oxygen-containing cyclic compound to obtain a type-A' target product,

wherein the acetophenone derivative 1 is a compound having a structure shown below:



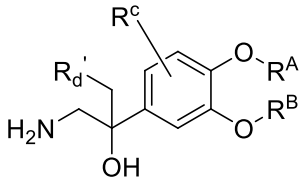
, in which R_d' is hydrogen, alkyl, aryl, alkynyl, or alkenyl, and in the above groups one or more hydrogen atom(s) attached to carbon in the groups is/are optionally substituted with alkyl, alkynyl, alkenyl, cycloalkyl, aryl, halogen, hydroxy, thio, cyano, or thioalkyl;

the intermediate product 2 is a compound having a structure shown below:



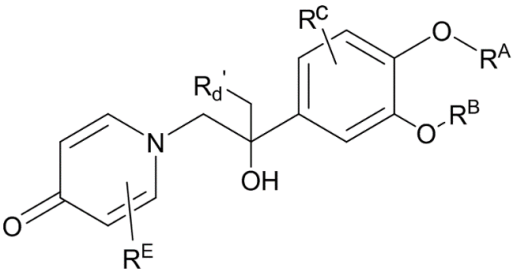
,

the intermediate product 3 is a compound having a structure shown below:



, and

the type-A' target product is a compound having a structure shown below:

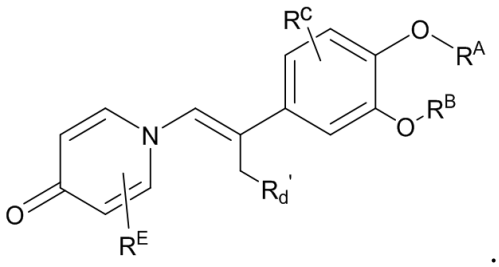


.

16. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

removing the hydroxyl group on the middle bridge of the type-A' target product according to claim 15 to obtain a type-C' target product,

wherein the type-C' target product is a compound having a structure shown below:



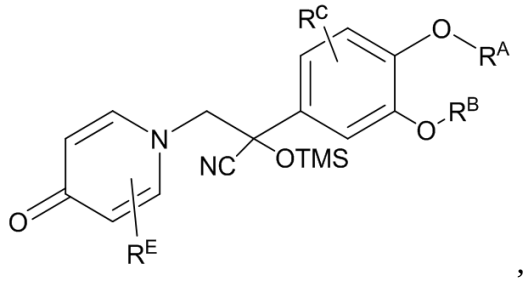
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17. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

reacting the carbonyl group on the middle bridge of the type-B target product according to claim 5 with trimethylsilyl cyanide to obtain an intermediate product Y1, and

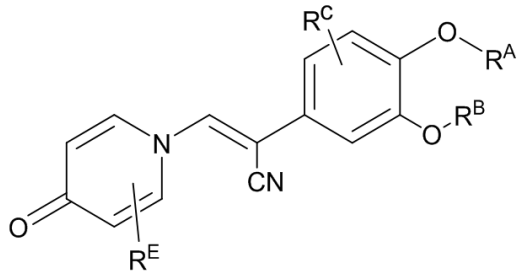
subjecting the intermediate product Y1 to reduction and elimination to obtain a type-C" target product,

wherein the intermediate product Y1 is a compound having a structure shown below:



,

the type-C" target product is a compound having a structure shown below:



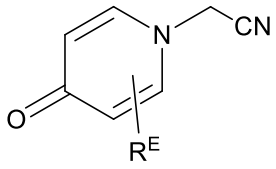
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18. A method for preparing the anti-inflammatory compound according to claim 1, comprising:

reacting a six-membered N-acetonitrile compound Z1 with a benzaldehyde derivative Z2 to obtain a type-C" target product,

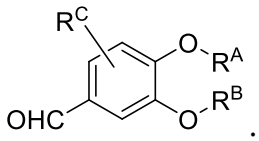
wherein the six-membered N-acetonitrile compound Z1 is a compound having a

structure shown below:



, and

the benzaldehyde derivative Z2 is a compound having a structure shown below:



.

19. A method for preparing an anti-inflammatory compound according to claim 1, comprising:

using a cinnamic acid derivative 1 as a starting material, and esterifying the cinnamic acid derivative 1 to obtain an intermediate product 2;

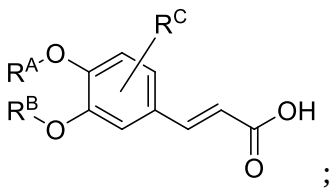
forming a ring from the double bond on the intermediate product 2 to obtain an intermediate product 3;

hydrolyzing the terminal ester group on the intermediate product 3 to give an intermediate product 4 having a carboxyl group;

aminating the terminal carboxyl group of the intermediate product 4 to obtain an intermediate product 5; and

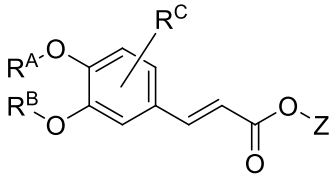
reacting the intermediate product 5 with a six-membered oxygen-containing cyclic compound to obtain a type-D target product,

wherein the cinnamic acid derivative 1 is a compound having a structure shown below:



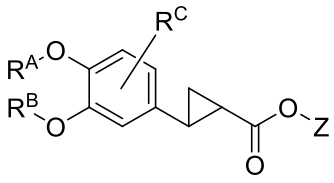
;

the intermediate product 2 is a compound having a structure shown below:



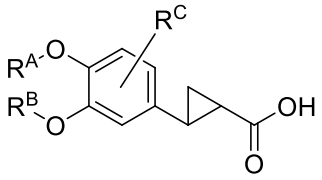
, in which Z is alkyl;

the intermediate product 3 is a compound having a structure shown below:



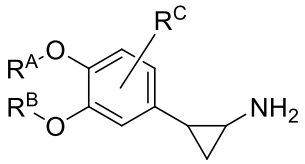
,

the intermediate product 4 is a compound having a structure shown below:



, and

the intermediate product 5 is a compound having a structure shown below:



.

20. Use of the anti-inflammatory compound according to claim 1 as a PDE4 inhibitor.

21. Use of the anti-inflammatory compound according to claim 1 in the treatment of inflammatory skin diseases.

22. A drug for treating the inflammatory skin diseases according to claim 21, comprising 0.01-10% of the anti-inflammatory compound according to claim 1; and

other components selected from a surfactant, a lipid compound, and an auxiliary agent;

wherein the amount of the surfactant accounts for 10-30% of the total weight of the drug;

the amount of the lipid compound accounts for 50-85% of the total weight of the drug; and

the amount of the auxiliary agent accounts for 10-30% of the total weight of the drug.