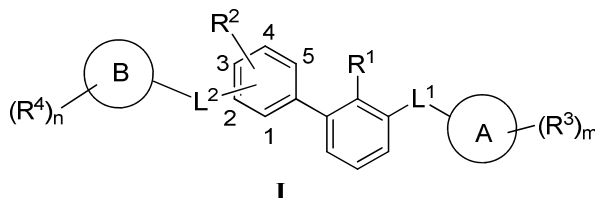


What is claimed is:

1. A diphenyl-like compound represented by general formula I, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, ~~or stereoisomer, or prodrug~~ thereof:



wherein,

ring A and ring B are independently C₆-C₂₀ aromatic ring ~~or heteroaromatic ring~~;

~~L¹ is a chemical bond, alkynyl, -C(R⁵)=C(R⁶)- or -CR⁷R⁸-CR⁹R¹⁰-, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or unsubstituted aryl or substituted or unsubstituted heteroaryl; L² is a chemical bond, alkynyl, -C(R⁵)=C(R⁶)- or -CR⁷R⁸-CR⁹R¹⁰-, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or unsubstituted aryl or substituted or unsubstituted heteroaryl, or absent;~~

~~R⁵, and R⁶, R⁷, R⁸, R⁹ and R¹⁰ are independently hydrogen, deuterium, halogen, cyano, or substituted or unsubstituted alkyl respectively;~~

R¹ and R² are independently deuterium, halogen, cyano, or substituted or unsubstituted alkyl;

each R³ and each R⁴ are independently hydrogen, deuterium, hydroxyl, -SR¹¹, -NR¹²R¹³, halogen, cyano, substituted or unsubstituted alkyl, substituted or unsubstituted C₁-C₄ alkoxy, -CONH₂, -COR¹⁴, -COOR¹⁵ or -OCOR¹⁶; R¹¹, R¹² and R¹³ are independently hydrogen, C₁-C₄ alkyl, substituted C₁-C₄ alkyl or -COR^a, R^a is hydrogen, hydroxyl, C₁-C₄ alkyl or C₁-C₄ alkoxy;

R¹⁴, R¹⁵ and R¹⁶ are independently hydrogen, C₁-C₄ alkyl or substituted C₁-C₄ alkyl;

among R¹¹, R¹², R¹³, R¹⁴, R¹⁵ and R¹⁶, the substituted in the substituted C₁-C₄ alkyl refers to being substituted with one or more of C₆-C₁₄ aryl, substituted C₆-C₁₄ aryl, C₁-C₁₀ heteroaryl and substituted C₁-C₁₀ heteroaryl;

~~substituents in the substituted cycloalkyl, the substituted heterocycloalkyl, the substituted aryl, the substituted heteroaryl in L¹ and L², the substituted alkyl in R¹ and R², the substituted~~

alkyl or the substituted C₁-C₄ alkoxy in each R³ and each R⁴ are selected from one or more of

halogen, cyano, C₁-C₄ alkyl, hydroxyl, $\begin{array}{c} \text{R}^{17} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{18} \end{array}$, C₆-C₁₄ aryl, substituted C₆-C₁₄ aryl, C₁-C₁₀ heteroaryl, substituted C₁-C₁₀ heteroaryl, C₁-C₄ alkoxy, C₁-C₄ carboxyl, C₁-C₄ ester group and

C₁-C₄ amido; in $\begin{array}{c} \text{R}^{17} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{18} \end{array}$, R¹⁷ and R¹⁸ are independently hydrogen, substituted or unsubstituted C₁-C₄ alkyl, substituted or unsubstituted C₆-C₁₄ aryl, substituted or unsubstituted C₃-C₆ cycloalkyl, or substituted or unsubstituted C₁-C₄ alkoxy; or R¹⁷, R¹⁸ together with the nitrogen atom to which they are attached form a substituted or unsubstituted 5 to 7-membered heterocycle; in the heterocycle, heteroatom is N, or N and O, the number of heteroatom is 1 to 4; each R¹⁷ and each R¹⁸ are identical or different;

substituents in the substituted C₁-C₄ alkyl, the substituted C₆-C₁₄ aryl, the substituted C₃-C₆ cycloalkyl, the substituted C₁-C₄ alkoxy and the substituted 5 to 7-membered heterocycle in R¹⁷ and R¹⁸ are selected from one or more of halogen, cyano, C₁-C₄ alkyl, substituted C₁-C₄ alkyl, C₆-C₁₄ aryl, substituted C₆-C₁₄ aryl, C₁-C₁₀ heteroaryl, substituted C₁-C₁₀ heteroaryl,

hydroxyl, $\begin{array}{c} \text{R}^{a1} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{b1} \end{array}$, C₁-C₄ alkoxy, C₁-C₄ carboxyl, C₁-C₄ ester group and C₁-C₄ amido;

in R¹⁷ and R¹⁸, when substituents in the substituted C₁-C₄ alkyl, the substituted C₆-C₁₄ aryl, the substituted C₃-C₆ cycloalkyl, the substituted C₁-C₄ alkoxy and the substituted 5 to 7-membered heterocycle are substituted C₁-C₄ alkyl, in the substituents, substituents in the substituted C₁-C₄ alkyl are selected from one or more of halogen, cyano, C₁-C₄ alkyl, C₆-C₁₄ aryl, substituted C₆-C₁₄ aryl, C₁-C₁₀ heteroaryl, substituted C₁-C₁₀ heteroaryl, hydroxyl,

$\begin{array}{c} \text{R}^{a1} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{b1} \end{array}$, C₁-C₄ alkoxy, C₁-C₄ carboxyl, C₁-C₄ ester group and C₁-C₄ amido; in $\begin{array}{c} \text{R}^{a1} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{b1} \end{array}$, R^{a1}

and R^{b1} are independently hydrogen, C₁-C₄ alkyl or $\begin{array}{c} \text{O} \\ || \\ \text{---}\text{C} \\ | \\ \text{R}^{a11} \end{array}$, R^{a11} is C₁-C₄ alkyl;

all the above C₁-C₁₀ heteroaryl refer to C₁-C₁₀ heteroaryl in which heteroatom is selected from N, O and S and the number of heteroatom is 1, 2, 3 or 4 ~~1 to 4~~;

substituents in all the above substituted C₆-C₁₄ aryl and substituted C₁-C₁₀ heteroaryl are

selected from one or more of cyano, halogen, hydroxyl, C₁-C₄ alkyl and C₁-C₄ alkoxy;

when substituents are more than one, the substituents are identical or different;

in R⁵, R⁶, R¹, R², R³ and R⁴, the alkyl refers to branched and linear saturated aliphatic hydrocarbonyl comprising 1 to 20 carbon atoms;

m is 1, 2 or 3;

n is 1, 2 or 3.

2. The diphenyl-like compound represented by general formula I, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in claim 1, wherein

in ring A and ring B, the aromatic ring is C₆-C₂₀ aromatic ring, preferably is C₆-C₁₄ aromatic ring, more preferably C₆-C₁₀ aromatic ring, most more preferably benzene, naphthalene, tetrahydronaphthalene, 2,3-dihydroindene, diphenyl, phenanthrene, anthracene or acenaphthene;

~~and/or, the heteroaromatic ring refers to C₁-C₁₀ heteroaromatic ring in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, preferably C₁-C₈ heteroaromatic ring in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, more preferably C₁-C₆ heteroaromatic ring in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, most preferably, acridine, carbazole, cinnoline, carboline, quinoxaline, imidazole, pyrazole, pyrrole, indole, indoline, benzotriazole, benzimidazole, furan, thiophene, isothiazole, benzothiophene, dihydrobenzothiophene, benzofuran, isobenzofuran, benzoxazole, benzofurazan, benzopyrazole, quinoline, isoindoline, isoquinoline, oxazole, oxadiazole, isoxazole, indole, pyrazine, pyridopyridine, tetrazolopyridine, pyridazine, pyridine, naphthyridine, pyrimidine, pyrrole, tetrazole, thiadiazole, thiazole, thiophene, triazole, quinazoline, tetrahydroquinoline, dihydrobenzimidazole, dihydrobenzofuran, dihydrobenzoxazole or dihydroquinoline;~~

and/or, in R¹⁷ and R¹⁸, the cycloalkyl is C₃-C₂₀ cycloalkyl, preferably C₃-C₁₀ cycloalkyl, more preferably C₃-C₆ cycloalkyl, most preferably, is cyclopropyl, cyclobutyl, cyclopentyl, or cyclohexyl, cycloheptyl, cyclooctyl, cyclodecyl and cyclododecyl or cyclohexenyl;

and/or, the heterocycloalkyl refers to C₂-C₁₀ non aromatic ring in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, preferably C₂-C₈ heterocycloalkyl in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, further preferably C₂-C₆ heterocycloalkyl in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, most preferably, tetrahydropyranyl, azetidiny, 1,4 dioxanyl, piperaziny, piperidiny, pyrrolidiny, morpholiny, thiomorpholiny, dihydrofuryl, dihydroimidazolyl, indoliny, dihydroisoxazolyl, dihydroisothiazolyl, dihydrooxadiazolyl, dihydrooxazolyl, dihydropyraziny, dihydropyrazolyl, dihydropyridyl, dihydropyrimidinyl, dihydropyrrolyl, dihydroquinolyl, dihydrotetrazolyl, dihydrothiadiazolyl, dihydrothiazolyl, dihydrothiophenyl, dihydrotriazolyl, dihydroazetidiny, methylenedioxybenzoyl, tetrahydrofuryl, tetrahydrothiophenyl or N-oxides thereof;

and/or, in R¹⁷ and R¹⁸, substituents in the substituted C₁-C₄ alkyl in R¹¹, R¹², R¹³, R¹⁴, R¹⁵ and R¹⁶, substituents in the substituted alkyl in R¹ and R², substituents in the substituted alkyl or the substituted C₁-C₄ alkoxy in each R³ and each R⁴, substituents in the substituted C₁-C₄ alkyl in R¹⁷ and R¹⁸, substituents in the substituted C₆-C₁₄ aryl in R¹⁷ and R¹⁸, substituents in the substituted C₃-C₆ cycloalkyl in R¹⁷ and R¹⁸, substituents in the substituted C₁-C₄ alkoxy in R¹⁷ and R¹⁸, substituents in the substituted 5 to 7-membered heterocycle in R¹⁷ and R¹⁸, the aryl is C₆-C₂₀ aryl, preferably C₆-C₁₄ aryl, more preferably is C₆-C₁₀ aryl, most preferably phenyl, naphthyl, tetrahydronaphthyl, 2,3-dihydroindenyl, xenyl, phenanthryl, anthryl or acenaphthyl,

and/or, in the substituents in the substituted C₁-C₄ alkyl in R¹¹, R¹², R¹³, R¹⁴, R¹⁵ and R¹⁶, substituents in the substituted alkyl in R¹ and R², substituents in the substituted alkyl or the substituted C₁-C₄ alkoxy in each R³ and each R⁴, substituents in the substituted C₁-C₄ alkyl in R¹⁷ and R¹⁸, substituents in the substituted C₆-C₁₄ aryl in R¹⁷ and R¹⁸, substituents in the substituted C₃-C₆ cycloalkyl in R¹⁷ and R¹⁸, substituents in the substituted C₁-C₄ alkoxy in R¹⁷ and R¹⁸, substituents in the substituted 5 to 7-membered heterocycle in R¹⁷ and R¹⁸, the C₁-C₁₀ heteroaryl refers to C₄-C₁₀ heteroaryl in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, further preferably C₁-C₈ heteroaryl in which heteroatom

is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, ~~more~~ preferably C₁-C₆ heteroaryl in which heteroatom is selected from O, N and S and the number of heteroatom is 1, 2, 3 or 4, ~~most~~ more preferably, benzimidazolyl, benzofuryl, benzofurazanyl, benzopyrazolyl, benzotriazolyl, benzothiophenyl, benzoxazolyl, carbazolyl, carbolinyl, cinnolinyl, furyl, imidazolyl, indolinyl, indolyl, indazolyl, isobenzofuryl, isoindolinyl, isoquinolyl, isothiazolyl, isooxazolyl, naphthyridinyl, oxadiazolyl, oxazolyl, oxazoline, isoxazoline, oxetanyl, pyranyl, pyrazinyl, pyrazolyl, pyridazinyl, pyridopyridyl, pyridazinyl, pyridyl, pyrimidinyl, pyrrolyl, quinazolyl, quinolyl, quinoxalinyl, tetrazolyl, tetrazolopyridyl, thiadiazolyl, thiazolyl, thiophenyl or triazolyl;

and/or, in R⁵, R⁶, R¹, R², each R³, each R⁴, substituents in the substituted alkyl in R¹ and R², substituents in the substituted alkyl or the substituted C₁-C₄ alkoxy in each R³ and each R⁴, substituents in the substituted C₁-C₄ alkyl in R¹⁷ and R¹⁸, substituents in the substituted C₆-C₁₄ aryl in R¹⁷ and R¹⁸, substituents in the substituted C₃-C₆ cycloalkyl in R¹⁷ and R¹⁸, substituents in the substituted C₁-C₄ alkoxy in R¹⁷ and R¹⁸, substituents in the substituted 5 to 7-membered heterocycle in R¹⁷ and R¹⁸, substituents in substituted C₆-C₁₄ aryl and substituents in substituted C₁-C₁₀ heteroaryl, the halogen is fluorine, chlorine, bromine or iodine;

and/or, in R⁵, R⁶, R¹, R², each R³ and each R⁴, the alkyl refers to ~~branched and linear saturated aliphatic hydrocarbonyl comprising 1 to 20 carbon atoms, preferably 1 to 10 carbon atoms, more preferably 1 to 8 carbon atoms, most~~ more preferably, methyl, ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, isobutyl, pentyl, hexyl, heptyl, ~~octyl, nonyl, decyl, 4,4-dimethylpentyl, 2,2,4-trimethylpentyl, undecyl, dodecyl~~ and various isomers thereof;

and/or, in each R³, each R⁴, R^a, R¹⁷ and R¹⁸, substituents in the substituted alkyl in R¹ and R², substituents in the substituted alkyl or the substituted C₁-C₄ alkoxy in each R³ and each R⁴, substituents in the substituted C₁-C₄ alkyl in R¹⁷ and R¹⁸, substituents in the substituted C₆-C₁₄ aryl in R¹⁷ and R¹⁸, substituents in the substituted C₃-C₆ cycloalkyl in R¹⁷ and R¹⁸, substituents in the substituted C₁-C₄ alkoxy in R¹⁷ and R¹⁸, substituents in the substituted 5 to 7-membered heterocycle in R¹⁷ and R¹⁸, substituents in substituted C₆-C₁₄ aryl and substituted C₁-C₁₀ heteroaryl, the C₁-C₄ alkoxy represents cyclic or non-cyclic alkyl linked via oxygen bridge with the recited carbon atom number, preferably ~~C₁-C₄ alkoxy, more preferably methoxy,~~

ethoxy, n-propoxy, isopropoxy or tert-butoxy;

and/or, in R¹⁷ and R¹⁸, the 5 to 7-membered heterocycle refers to 5 to 7-membered heterocycle in which heteroatom is selected from O, N and S, the number of heteroatom is 1, 2, 3 or 4 and the number of carbon atom is 1, 2, 3, 4, 5 or 6, preferably azetidiny, piperaziny, piperidiny, pyrrolidiny, morpholiny, thiomorpholiny, dihydroimidazoly, indoliny, dihydroisoxazoly, dihydroisothiazoly, dihydrooxadiazoly, dihydrooxazoly, dihydropyraziny, dihydropyrazoly, dihydropyridy, dihydropyrimidiny, dihydropyrroly, dihydroquinoly, dihydrotetrazoly, dihydrothiadiazoly, dihydrothiazoly, dihydrotriazoly or dihydroazetidiny.

3. The diphenyl-like compound represented by general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in claim 1 or 2, wherein

~~L¹ is alkynyl, C(R⁵)=C(R⁶), CR⁷R⁸-CR⁹R¹⁰, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or unsubstituted aryl, or substituted or unsubstituted heteroaryl, preferably alkynyl, C(R⁵)=C(R⁶) or CR⁷R⁸-CR⁹R¹⁰, more preferably C(R⁵)=C(R⁶), most preferably -CH=CH-;~~

~~and/or, L² is alkynyl, C(R⁵)=C(R⁶), CR⁷R⁸-CR⁹R¹⁰, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocycloalkyl, substituted or unsubstituted aryl, or substituted or unsubstituted heteroaryl or absent, preferably alkynyl, C(R⁵)=C(R⁶), CR⁷R⁸-CR⁹R¹⁰ or absent, more preferably C(R⁵)=C(R⁶) or absent, most preferably -CH=CH- or absent;~~

~~and/or, R⁵, and R⁶, R⁷, R⁸, R⁹ and R¹⁰ are independently hydrogen or deuterium respectively;~~

~~and/or, R¹ is halogen, cyano, substituted or unsubstituted alkyl, the alkyl is preferably C₁-C₄ alkyl, more preferably methyl; substituents in the substituted alkyl are preferably halogen or hydroxy;~~

~~and/or, R² is deuterium, halogen, cyano, substituted or unsubstituted alkyl, the alkyl is preferably C₁-C₄ alkyl, more preferably methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl or~~

tert-butyl, substituents in the substituted alkyl are preferably one or more of halogen, cyano, C₁-C₄ alkyl, hydroxyl, C₁-C₄ alkoxy, C₁-C₄ carboxyl, C₁-C₄ ester group and C₁-C₄ amido;

and/or, R³ and R⁴ are independently deuterium, halogen, cyano, -SR¹¹, -NR¹²R¹³, substituted or unsubstituted alkyl, or substituted or unsubstituted C₁-C₄ alkoxy; preferably are independently deuterium, halogen, cyano, -SR¹¹, substituted or unsubstituted alkyl, or substituted or unsubstituted C₁-C₄ alkoxy.

4. The diphenyl-like compound represented by general formula I, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in at least any one of claims 1 to 3, wherein

R¹ and R² are independently halogen, alkyl, or alkyl substituted with halogen;

or, R³ and R⁴ are halogen;

or, R³ and R⁴ are substituted or unsubstituted alkyl, substituents in the substituted alkyl are

substituted with one or more of halogen, cyano, hydroxyl, $\begin{array}{c} R^{17} \\ | \\ \text{---}N \\ | \\ R^{18} \end{array}$, C₆-C₁₄ aryl, substituted C₆-C₁₄ aryl, C₁-C₁₀ heteroaryl, substituted C₁-C₁₀ heteroaryl, C₁-C₄ alkoxy and C₁-C₄ carboxyl,

preferably are substituted with one or more of halogen, $\begin{array}{c} R^{17} \\ | \\ \text{---}N \\ | \\ R^{18} \end{array}$, substituted C₆-C₁₄ aryl and substituted C₁-C₁₀ heteroaryl, when substituents are more than one, the substituents are identical or different,

or, R³ and R⁴ are substituted or unsubstituted C₁-C₄ alkoxy, substituents in the substituted

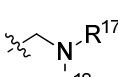
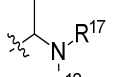
C₁-C₄ alkoxy are substituted with one or more of halogen, cyano, hydroxyl, $\begin{array}{c} R^{17} \\ | \\ \text{---}N \\ | \\ R^{18} \end{array}$, C₆-C₁₄ aryl, substituted C₆-C₁₄ aryl, C₁-C₁₀ heteroaryl, substituted C₁-C₁₀ heteroaryl and C₁-C₄ alkoxy, preferably are substituted with one or more of C₁-C₁₀ heteroaryl, substituted C₁-C₁₀ heteroaryl and C₁-C₄ alkoxy, most preferably are substituted with C₁-C₄ alkoxy; when substituents are more than one, the substituents are identical or different.

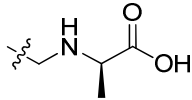
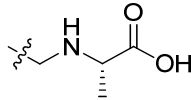
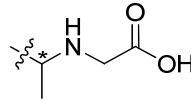
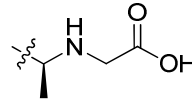
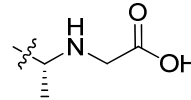
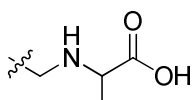
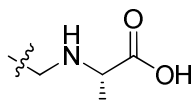
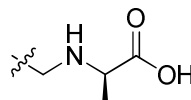
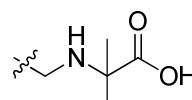
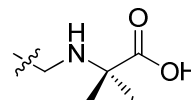
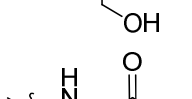
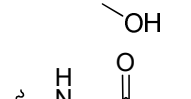
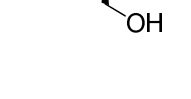
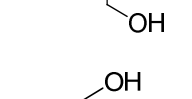
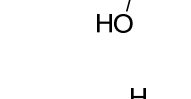
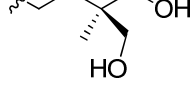
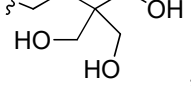
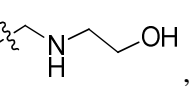
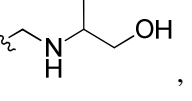
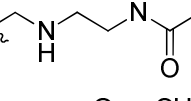
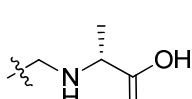
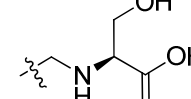
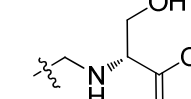
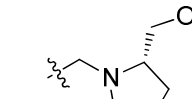
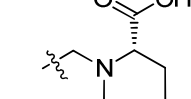
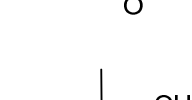
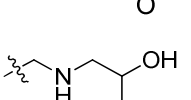
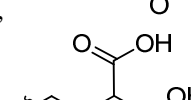
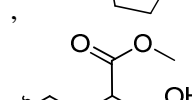
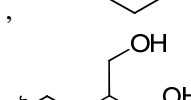
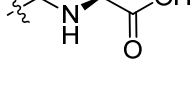
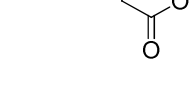
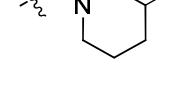
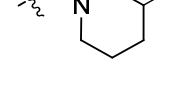
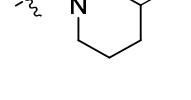
5. The diphenyl-like compound represented by general formula I, a pharmaceutically

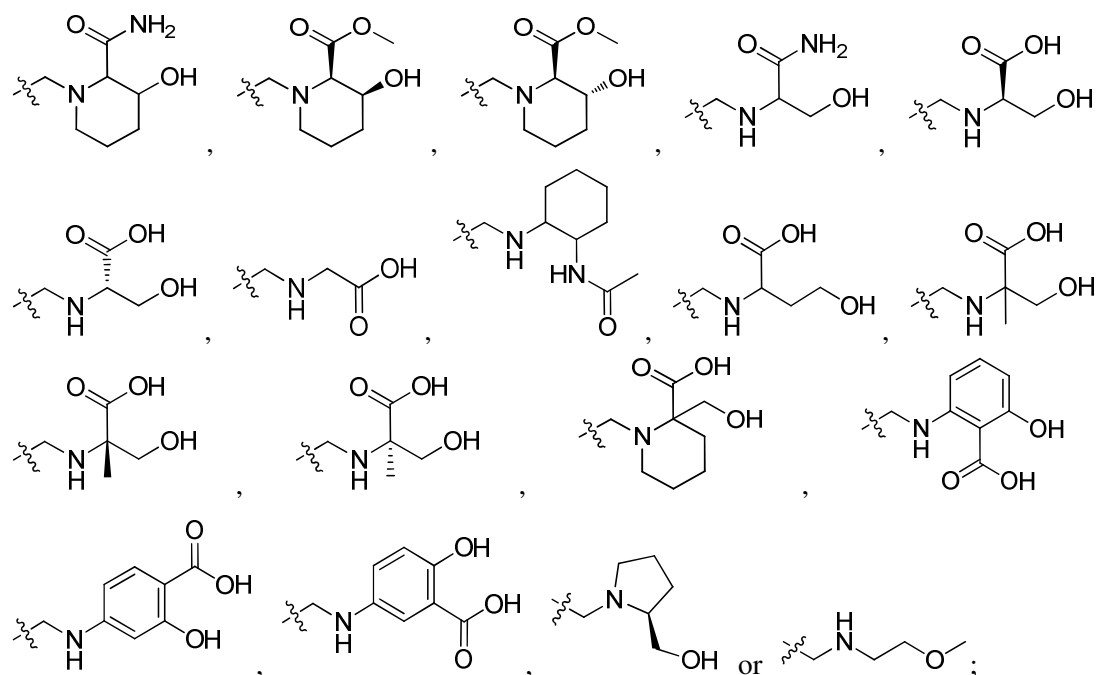
acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in ~~at least any~~ one of claims 1 to 4, wherein

R¹ and R² are independently halogen, C₁-C₄ alkyl, or C₁-C₄ alkyl substituted with one or more of F, Cl, Br and I (for example, -CH₂F, -CHF₂ or -CF₃); or, R³ and R⁴ are alkyl substituted with halogen, the alkyl substituted with halogen is C₁-C₄ alkyl preferably substituted with one or more of F, Cl, Br and I, preferably -CF₃,

or, R³ and R⁴ are alkyl substituted with , the alkyl substituted with  is preferably C₁-C₄ alkyl substituted with , the C₁-C₄ alkyl substituted with  is

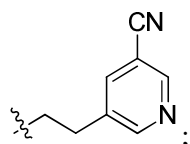
preferably  or , wherein, one of R¹⁷ and R¹⁸ is H, the other one is alkyl substituted with one or more of C₁-C₄ alkoxy, hydroxy and carboxyl, when R³ and R⁴ are alkyl

substituted with , the alkyl substituted with  is preferably , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , , ,



or, R^3 and R^4 is alkyl substituted with substituted C_6-C_{14} aryl, preferably ;

or, R^3 and R^4 is alkyl substituted with substituted C_1-C_{10} heteroaryl, preferably



or, when R^3 is substituted or unsubstituted alkyl, R^3 is at meta-position or para-position of the atom linked with L^1 on ring A;

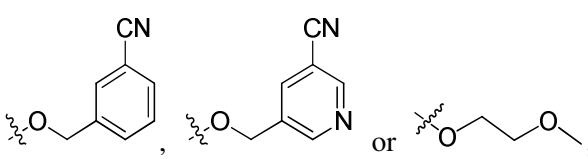
or, when R^4 is substituted or unsubstituted alkyl, R^4 is at meta-position or para-position of the atom linked with L^2 on ring B;

or, when R^3 is substituted or unsubstituted alkyl, then 0, 1 or 2 additional substituents can be present on ring A, when 1 additional substituent is present, the additional substituent is at para-position, meta-position or ortho-position of the substituted or unsubstituted alkyl;

or, when R^4 is substituted or unsubstituted alkyl, then 0, 1 or 2 additional substituents can be present on ring B, when 1 additional substituent is present, the additional substituent is at para-position, meta-position or ortho-position of the substituted or unsubstituted alkyl;

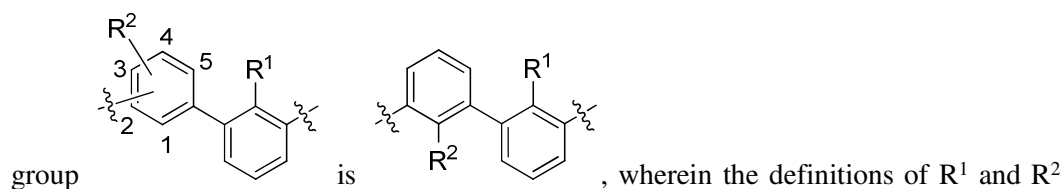
or, R^3 and R^4 are substituted or unsubstituted C_1-C_4 alkoxy, substituents in the substituted

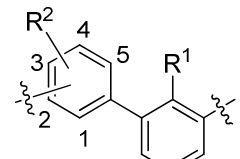
$\text{C}_1\text{-C}_4$ alkoxy are substituted with one or more of halogen, cyano, hydroxyl, $\text{N}(\text{R}^{17})\text{R}^{18}$, $\text{C}_6\text{-C}_{14}$ aryl, substituted $\text{C}_6\text{-C}_{14}$ aryl, $\text{C}_1\text{-C}_{10}$ heteroaryl, substituted $\text{C}_1\text{-C}_{10}$ heteroaryl and $\text{C}_1\text{-C}_4$ alkoxy; preferably R^3 and R^4 are substituted $\text{C}_1\text{-C}_4$ alkoxy, substituents in the substituted $\text{C}_1\text{-C}_4$ alkoxy are substituted with one or more of $\text{C}_1\text{-C}_{10}$ heteroaryl, substituted $\text{C}_1\text{-C}_{10}$ heteroaryl and $\text{C}_1\text{-C}_4$ alkoxy, when substituents are more than one, the substituents are identical or different; the

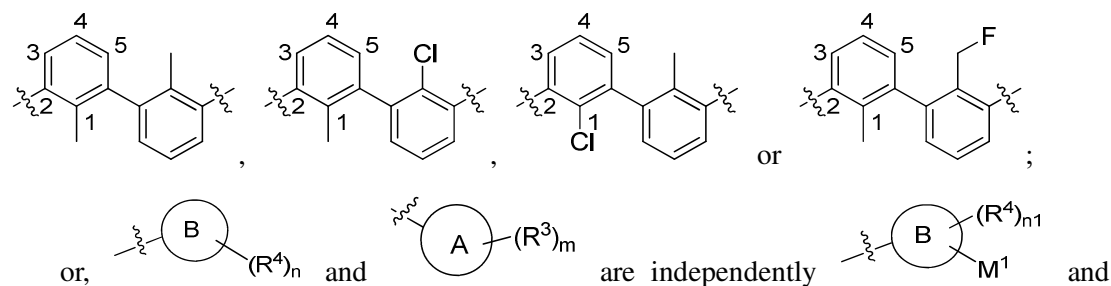
substituted $\text{C}_1\text{-C}_4$ alkoxy is preferably ; or, when R^3 is substituted or unsubstituted $\text{C}_1\text{-C}_4$ alkoxy, R^3 is at ortho-position or meta-position of the atom linked with L^1 on ring A;

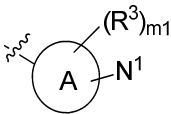
or, when R^4 is substituted or unsubstituted $\text{C}_1\text{-C}_4$ alkoxy, R^4 is at ortho-position or meta-position of the atom linked with L^2 on ring B.

6. The diphenyl-like compound represented by general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, ~~or stereoisomer, or prodrug~~ thereof as defined in ~~at least any~~ one of claims 1 to 5, wherein

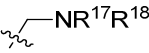
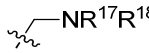


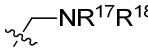
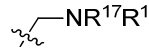
are the same as defined in claim 1 or 2; group  is preferably



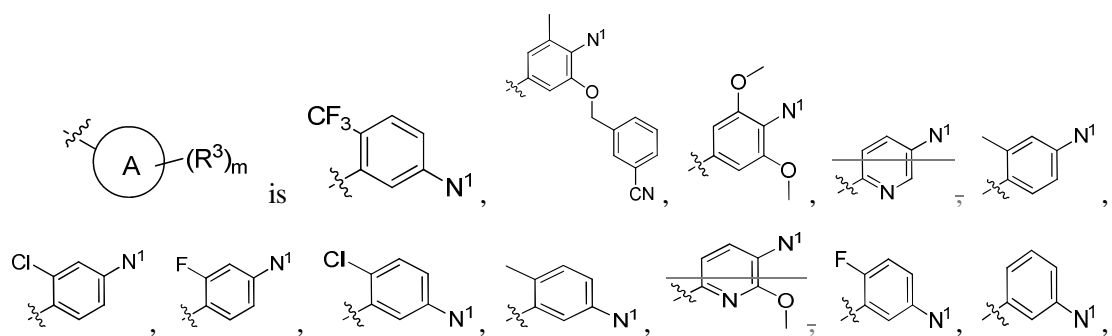

, wherein M¹ and N¹ are alkyl substituted with 
, or one of M¹ and N¹ is

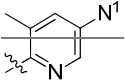
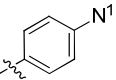
alkyl substituted with 
, the other one is substituted C₁-C₄ alkoxy; wherein the definitions of R¹⁷, R¹⁸, R³ and R⁴ are the same as defined in any one of claims 1 to 5, n₁ and m₁ are independently 0, 1 or 2;

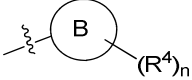
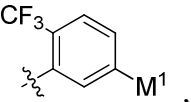
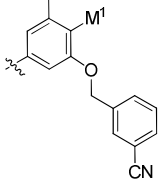
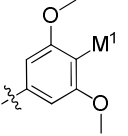
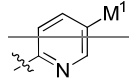
preferably, M¹ and N¹ are 
, or one of M¹ and N¹ is 
, the other one is C₁-C₄ alkoxy substituted with one or more of C₁-C₄ alkoxy, C₁-C₁₀ heteroaryl and substituted C₁-C₁₀ heteroaryl; R³ and R⁴ are hydrogen, halogen, alkyl, alkyl substituted with halogen, C₁-C₄ alkoxy or substituted C₁-C₄ alkoxy, substituents in the substituted C₁-C₄ alkoxy preferably are substituted with one or more of C₁-C₄ alkoxy, C₁-C₁₀ heteroaryl and substituted C₁-C₁₀ heteroaryl; the definitions of R¹⁷ and R¹⁸ are the same as defined in any one of claims 1 to 5;

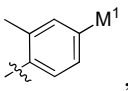
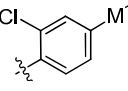
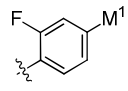
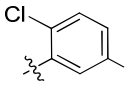
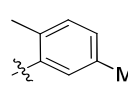
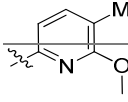
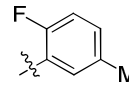
more preferably, M¹ and N¹ are 
, or one of M¹ and N¹ is 
, the other one is C₁-C₄ alkoxy substituted with C₁-C₄ alkoxy; R³ and R⁴ preferably are halogen, alkyl, alkyl substituted with halogen, C₁-C₄ alkoxy or C₁-C₄ alkoxy substituted with C₁-C₄ alkoxy; the definitions of R¹⁷ and R¹⁸ are the same as defined in any one of claims 1 to 5.

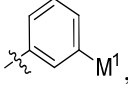
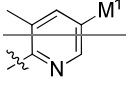
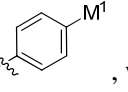
7. The diphenyl-like compound represented by general formula I, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in claim 6, wherein



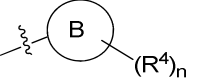
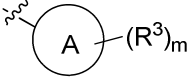
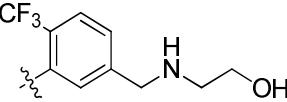
 or , wherein N¹, R¹⁷ and R¹⁸ are the same as those defined in claim 6;

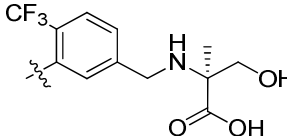
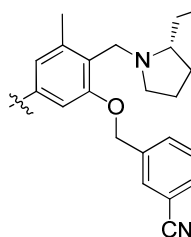
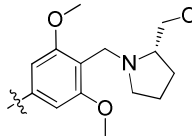
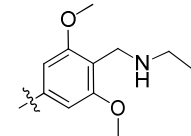
or  is , , , ,

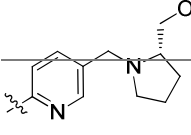
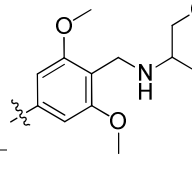
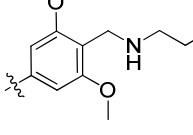
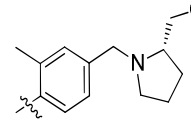
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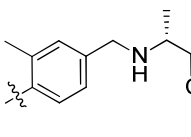
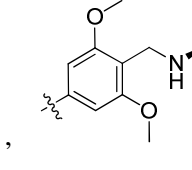
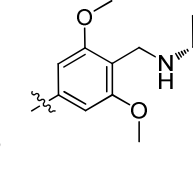
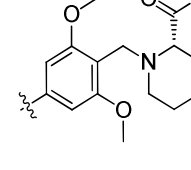
,  or , wherein the definitions of M¹, R¹⁷ and R¹⁸ are the same as defined in claim 6.

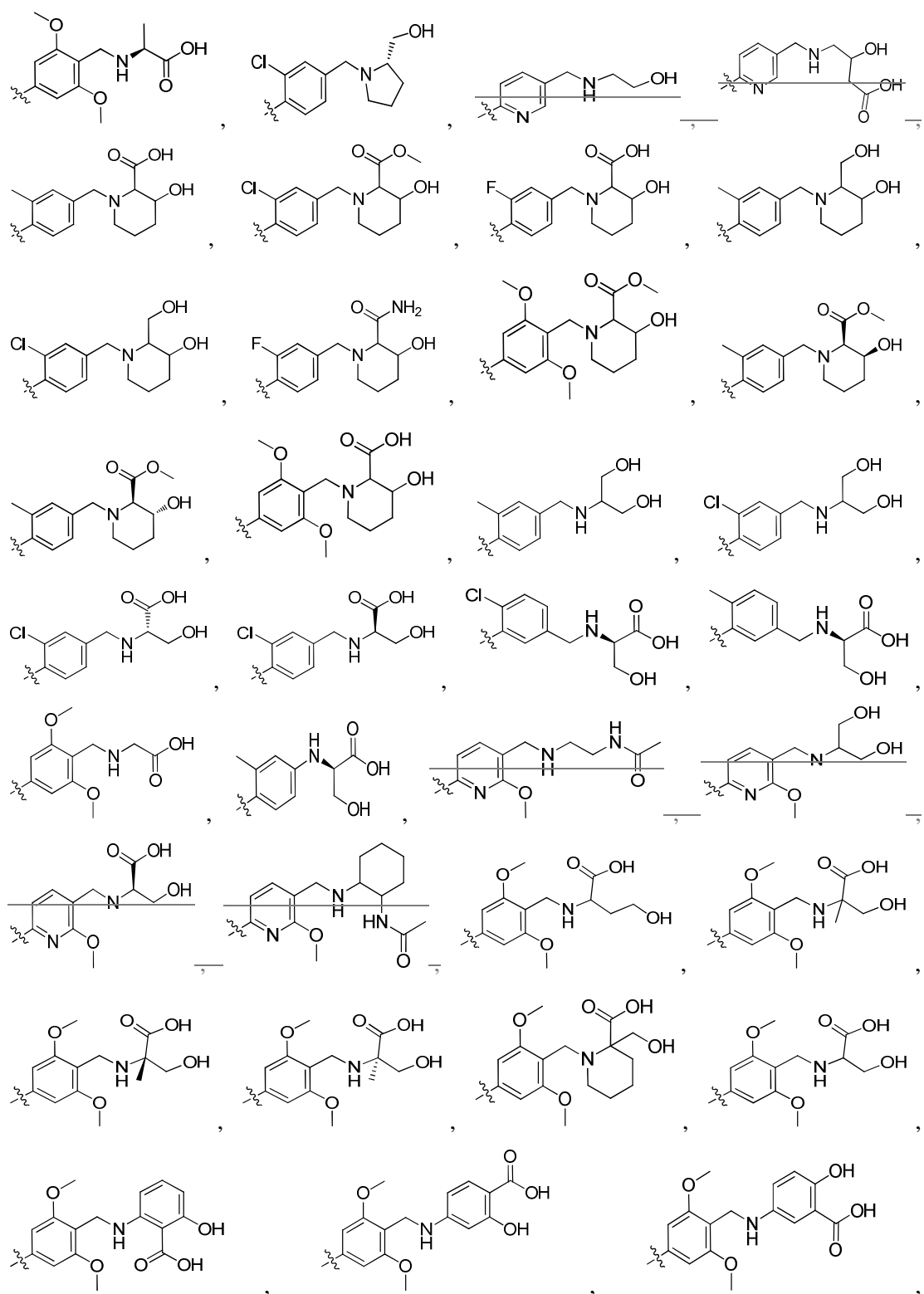
8. The diphenyl-like compound represented by general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in ~~at least~~any one of claims 1 to 7, wherein

 and  are independently ,

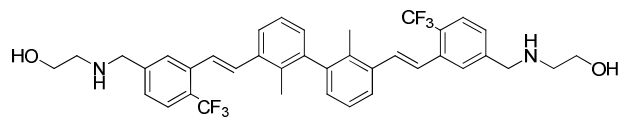
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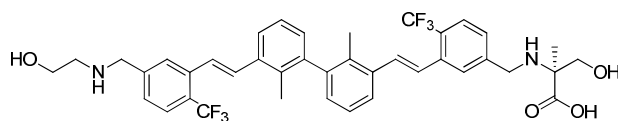
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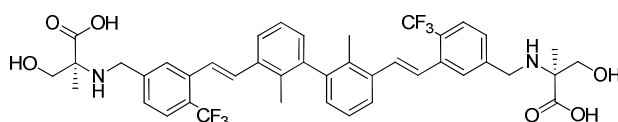
acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in at least any one of claims 1 to 8, wherein the diphenyl-like compound represented by general formula **I** is selected from any one compound of:



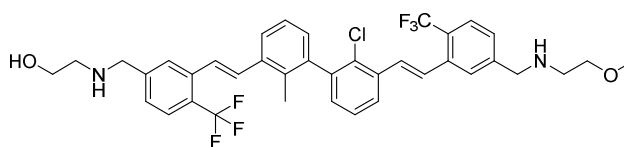
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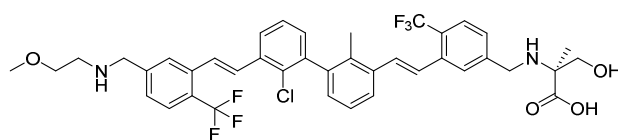
2



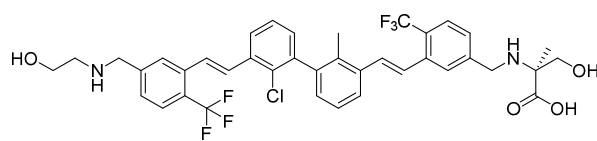
3



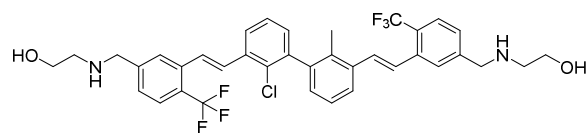
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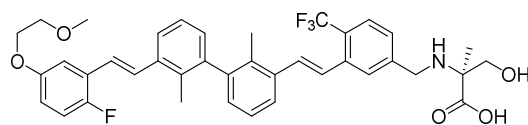
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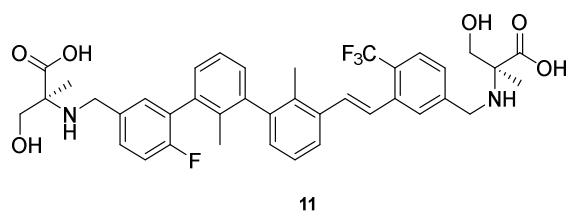
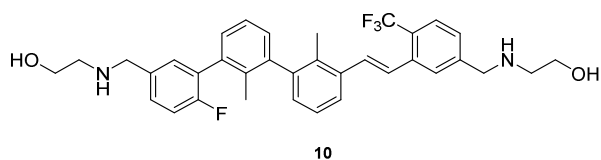
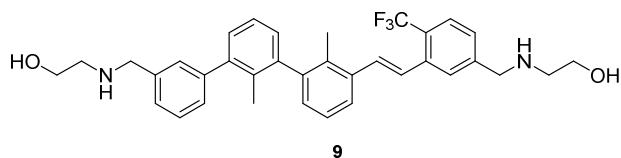
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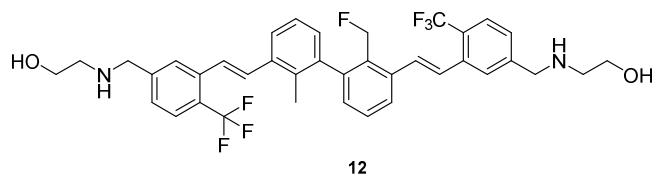
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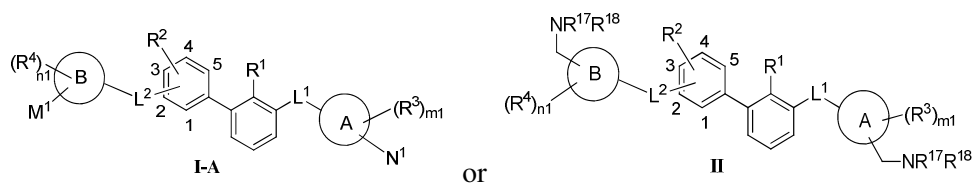
8



and



10. The diphenyl-like compound represented by general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, or prodrug thereof as defined in at least any one of claims 1 to 9, wherein the diphenyl-like compound represented by general formula **I** is a diphenyl-like compound represented by general formula **I-A** or **II**:

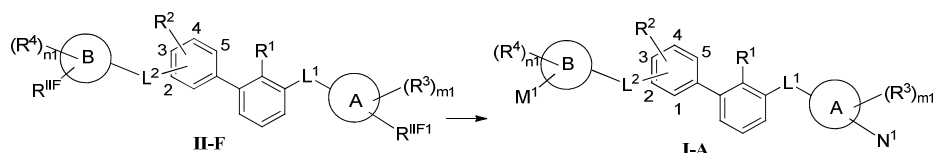


wherein, the definitions of ring A, ring B, L¹, L², R¹, R², R³, R⁴, ~~M¹~~, ~~N¹~~, R¹⁷ and R¹⁸ are the same as defined in any one of claims 1 to 9, n1 is 0, 1 or 2, m1 is 0, 1 or 2, the definitions of M¹ and N¹ are the same as defined in any one of claims 6 to 9.

11. A preparation method of the diphenyl-like compound represented by general formula **I-A** or **II** in claim 10, wherein

in the compound represented by general formula **I-A**, when -NH- or -COOH is contained

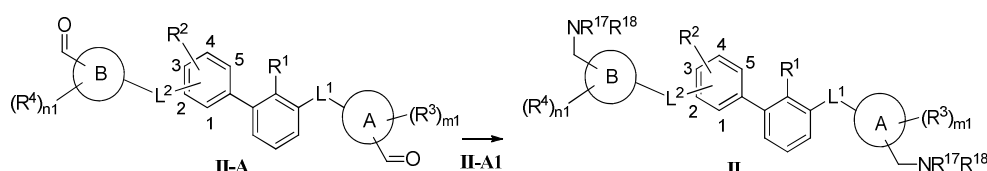
in M¹ and N¹, it is prepared by using a method comprising a step of: deprotecting a compound represented by general formula **II-F** as shown below, to obtain the diphenyl-like compound represented by general formula **I-A**,



wherein the definitions of ring A, ring B, L¹, L², R¹, R², R³, R⁴, M¹ and N¹ are the same as defined in claim 10, n₁ is 0, 1 or 2, m₁ is 0, 1 or 2, R^{IIF} is a group containing amino or carboxyl protecting group corresponding to M¹, R^{IIF1} is identical to N¹; or R^{IIF} is identical to M¹, R^{IIF1} is a group containing amino or carboxyl protecting group corresponding to N¹; or R^{IIF} is a group containing amino or carboxyl protecting group corresponding to M¹, R^{IIF1} is a group containing amino or carboxyl protecting group corresponding to N¹;

the preparation method of the diphenyl-like compound of general formula **II** employs any one method of:

(1) method 1 comprising a step of: reacting a compound represented by general formula **II-A** with a compound **II-A1** as shown below, to obtain the diphenyl-like compound represented by general formula **II**,

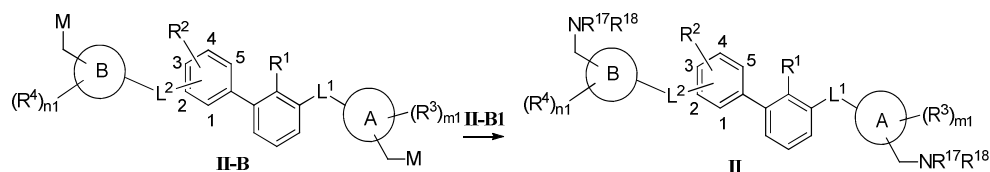


wherein the structure of the compound **II-A1** is as follows: $\text{NR}^{17}\text{R}^{18}$ or an acid salt thereof, the definitions of ring A, ring B, L¹, L², R¹, R², R³, R⁴, R¹⁷ and R¹⁸ are the same as defined

in claim 10, n₁ is 0, 1 or 2, m₁ is 0, 1 or 2; in this method, $\text{NR}^{17}\text{R}^{18}$ in ring A and ring B are identical;

(2) method 2 comprising a step of: reacting a compound represented by general formula **II-B** with a compound **II-B1** as shown below, to obtain the diphenyl-like compound

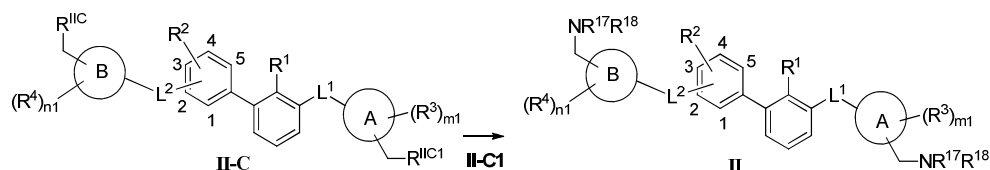
represented by general formula **II**,



wherein the structure of the compound **II-B1** is as follows: $\text{HN}(\text{R}^{17})(\text{R}^{18})$ or an acid salt thereof, the definitions of ring A, ring B, L^1 , L^2 , R^1 , R^2 , R^3 , R^4 , R^{17} and R^{18} are the same as defined

in claim 10, n_1 is 0, 1 or 2, m_1 is 0, 1 or 2, M is halogen; in this method, $\text{HN}(\text{R}^{17})(\text{R}^{18})$ in ring A and ring B are identical;

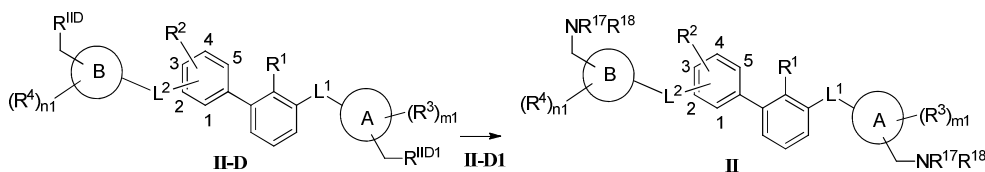
(3) method 3 comprising a step of: reacting a compound represented by general formula **II-C** with a compound **II-C1** as shown below, to obtain the diphenyl-like compound represented by general formula **II**,



wherein the structure of the compound **II-C1** is as follows: $\text{HN}(\text{R}^{17})(\text{R}^{18})$ or an acid salt thereof, the definitions of ring A, ring B, L^1 , L^2 , R^1 , R^2 , R^3 , R^4 , R^{17} and R^{18} are the same as defined

in claim 10, n_1 is 0, 1 or 2, m_1 is 0, 1 or 2; one of $\text{R}^{1\text{IC}}$ and $\text{R}^{1\text{IC}1}$ is $\text{HN}(\text{R}^{17})(\text{R}^{18})$, the other one is $\text{C}(=\text{O})\text{R}^{17}$, in this method, $\text{HN}(\text{R}^{17})(\text{R}^{18})$ in ring A and ring B are identical or different;

(4) method 4 comprising a step of: reacting a compound represented by general formula **II-D** with a compound **II-D1** as shown below, to obtain the diphenyl-like compound represented by general formula **II**,

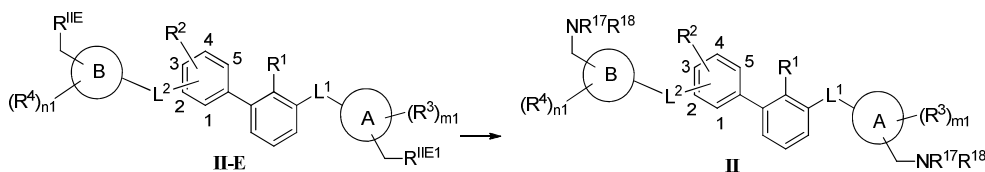


wherein the structure of the compound **II-D1** is as follows: $\text{HN} \begin{smallmatrix} \text{R}^{17} \\ \text{R}^{18} \end{smallmatrix}$ or an acid salt thereof, the definitions of ring A, ring B, L^1 , L^2 , R^1 , R^2 , R^3 , R^4 , R^{17} and R^{18} are the same as defined

in claim 10, n_1 is 0, 1 or 2, m_1 is 0, 1 or 2; one of R^{IID} and R^{IID1} is $\begin{smallmatrix} \text{R}^{17} \\ \text{---} \text{N} \text{---} \\ \text{R}^{18} \end{smallmatrix}$, the other one is

halogen, in this method, $\begin{smallmatrix} \text{R}^{17} \\ \text{---} \text{N} \text{---} \\ \text{R}^{18} \end{smallmatrix}$ in ring A and ring B are identical or different;

(5) method 5 comprising a step of: deprotecting a compound represented by general formula **II-E** as shown below, to obtain the diphenyl-like compound represented by general formula **II**, R^{17} or R^{18} in the compound represented by general formula **II** containing carboxyl;

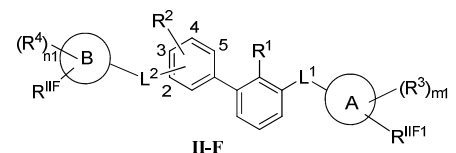
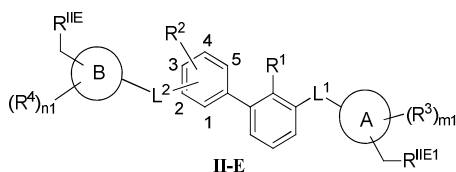
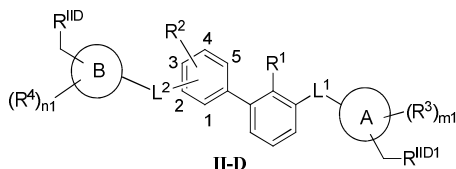
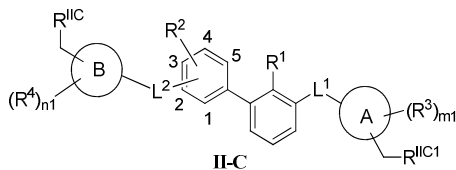
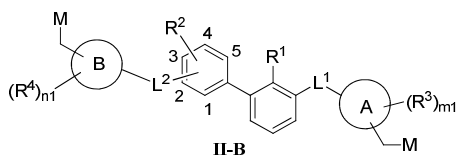
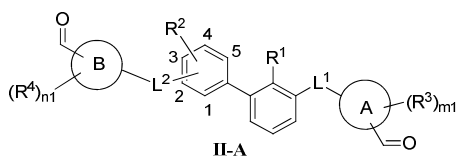


wherein the definitions of ring A, ring B, L^1 , L^2 , R^1 , R^2 , R^3 , R^4 , R^{17} and R^{18} are the same

as defined in claim 10, n_1 is 0, 1 or 2, m_1 is 0, 1 or 2, R^{IIIE} and R^{IIIE1} are $\begin{smallmatrix} \text{R}^{17} \\ \text{---} \text{N} \text{---} \\ \text{R}^{18} \end{smallmatrix}$, each $R^{17'}$ and each $R^{18'}$ are identical or different, and at least one contains carboxyl protecting group, $R^{17'}$ and $R^{18'}$ free of carboxyl protecting group are the same as the corresponding R^{17} and R^{18} in

general formula **II** respectively; in this method, $\begin{smallmatrix} \text{R}^{17} \\ \text{---} \text{N} \text{---} \\ \text{R}^{18} \end{smallmatrix}$ in ring A and ring B are identical or different.

12. A compound represented by general formula **II-A**, **II-B**, **II-C**, **II-D**, **II-E** and **II-F**:



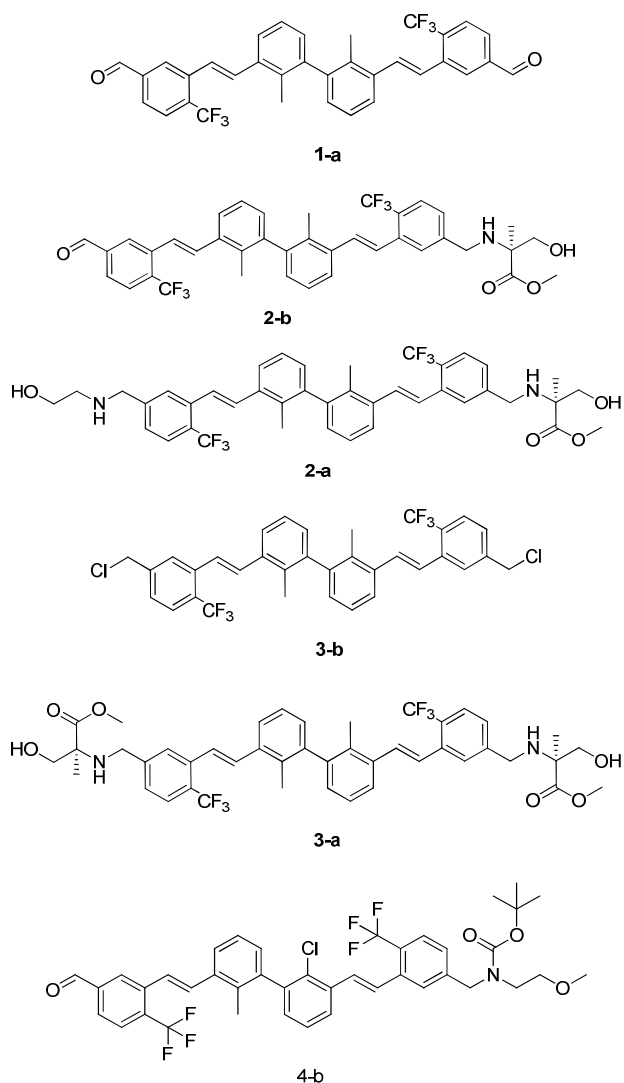
the definitions of ring A, ring B, L¹, L², R¹, R², R³, R⁴, ~~M¹~~, ~~N¹~~, R¹⁷ and R¹⁸ are the same as defined in ~~at least any one of claims 1 to 9~~, the definitions of M¹ and N¹ are the same as defined in any one of claims 6 to 9, n₁ is 0, 1 or 2, m₁ is 0, 1 or 2; M is halogen, one of R^{IIC}

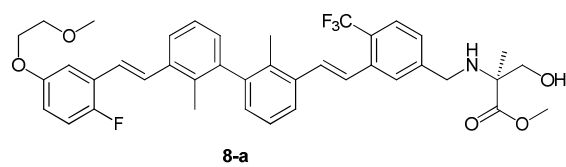
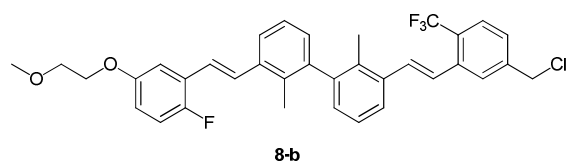
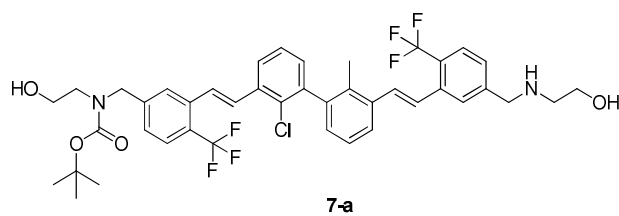
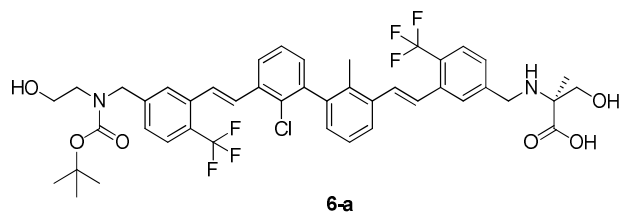
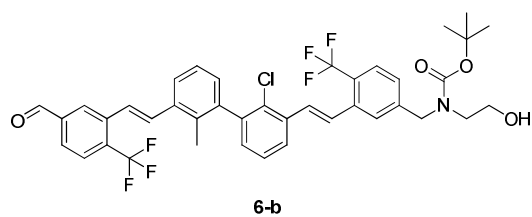
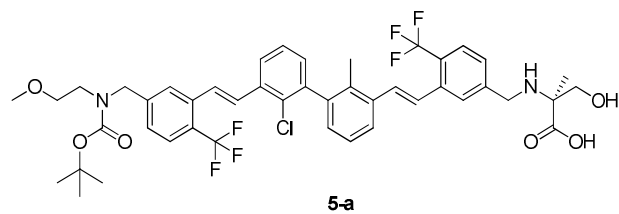
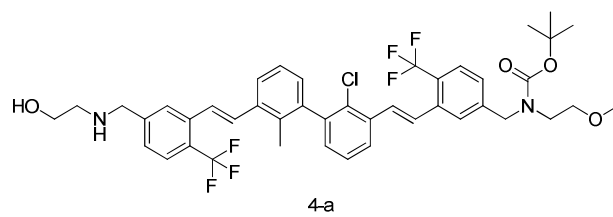
and R^{IIC1} is $\begin{array}{c} \text{R}^{17} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{18} \end{array}$, the other one is $\begin{array}{c} \text{---}\text{O} \end{array}$, one of R^{IID} and R^{IID1} is $\begin{array}{c} \text{R}^{17} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{18} \end{array}$, the other one is

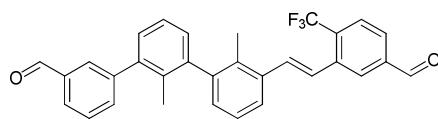
halogen, R^{IIE} and R^{IIE1} are $\begin{array}{c} \text{R}^{17} \\ | \\ \text{---}\text{N} \\ | \\ \text{R}^{18} \end{array}$, each R^{17'} and each R^{18'} are identical or different, and at least one contains carboxyl protecting group, R^{17'} and R^{18'} free of carboxyl protecting group are the same as the corresponding R¹⁷ and R¹⁸ in general formula **II** respectively; R^{IIF} is a group

containing amino or carboxyl protecting group corresponding to M^1 , R^{IIF1} is identical to N^1 ; or R^{IIF} is identical to M^1 , R^{IIF1} is a group containing amino or carboxyl protecting group corresponding to N^1 ; or R^{IIF} is a group containing amino or carboxyl protecting group corresponding to M^1 , R^{IIF1} is a group containing amino or carboxyl protecting group corresponding to N^1 .

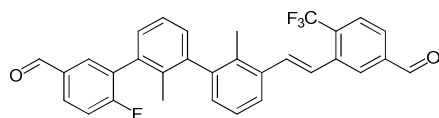
13. A compound as shown below:





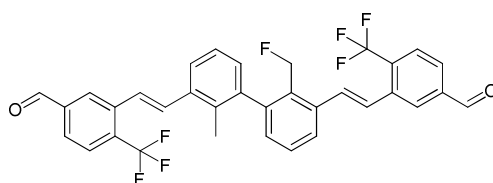


9-a



10-a

and/or



12-a

14. The diphenyl-like compound of general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~or prodrug~~ thereof as defined in at least any one of claims 1 to 9 for use as a PD-1 inhibitor and/or PD-L1 inhibitor.

15. The diphenyl-like compound represented by general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~metabolite, metabolic precursor and prodrug~~ thereof as defined in at least any one of claims 1 to 9 for preventing, alleviating or treating cancer, infection, or autoimmune disease ~~or related diseases thereof~~, wherein the cancer is preferably one or more of lung cancer, esophageal cancer, gastric cancer, colorectal cancer, liver cancer, nasopharyngeal cancer, brain tumor, breast cancer, cervical cancer, blood cancer and bone cancer.

16. A pharmaceutical composition comprising a therapeutically and/or prophylactically effective amount of the diphenyl-like compound represented by general formula **I**, a pharmaceutically acceptable salt, tautomer, mesomer, racemate, or stereoisomer, ~~metabolite, metabolic precursor or prodrug~~ thereof as defined in at least any one of claims 1 to 9, and a

pharmaceutically acceptable carrier and/or diluent.