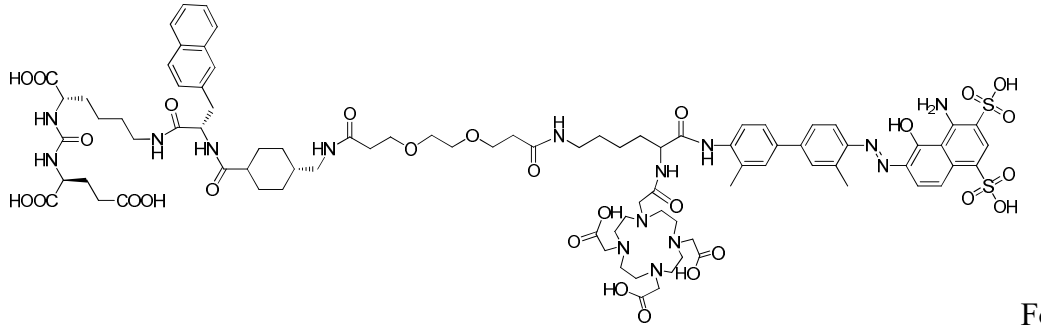
Claims

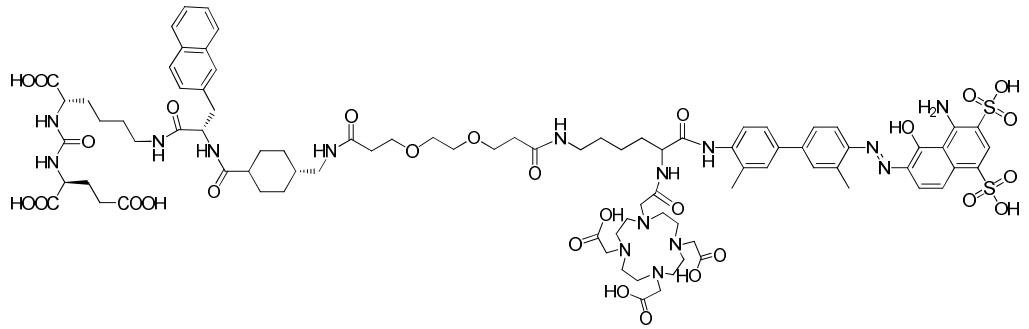
1. A compound targeting prostate specific membrane antigen or a pharmaceutically available salt thereof, wherein the molecular structure of the compound targeting prostate specific membrane antigen is shown in Formula (II-1):



Formula (II-1).

2. A method for preparing a compound targeting prostate specific membrane antigen, comprising the following steps:

introducing a Boc protective group to one end of 4,4'-diamino-3,3'-dimethyl biphenyl, followed by a reaction with 4,6-diamino-5-hydroxy-1,3-naphthalenedisulfonic acid to prepare a truncated Evans Blue derivative; removing the Boc protective group, followed by an amide condensation reaction with Nα- Fmoc-Nε-Boc-L-lysine; next, removing the Boc protective group under the action of TFA, followed by an amide condensation reaction with COOH-PEG_2-COOH and a reaction with PSMA-617 under the presence of EDC and NHS; then removing an Fmoc protective group using piperazine; and finally, carrying out a reaction with DOTA-NHS to obtain a compound having the following structure shown in Formula (II-1):



Formula (II-1).

3. A radiolabeled compound targeting prostate specific membrane antigen, wherein the compound is a complex obtained by using the compound shown in Formula (I) according to claim 1 as a ligand and labeling the ligand with a radionuclide.

4. The radiolabeled compound according to claim 3, wherein the radionuclide is any one of ^{177}Lu, ^{90}Y, ^{18}F, ^{64}Cu, ^{68}Ga, ^{62}Cu, ^{67}Cu, ^{86}Y, ^{89}Zr, ^{99m}Tc, ^{89}Sr, ^{153}Sm, ^{149}Tb, ^{161}Tb, ^{186}Re, ^{188}Re,

^{212}Pb, ^{213}Bi, ^{223}Ra, ^{225}Ac, ^{226}Th, ^{227}Th, ^{131}I, ^{211}At, or ^{111}In.

5. The radiolabeled compound according to claim 3, wherein the radionuclide is ^{68}Ga, ^{177}Lu, or ^{90}Y.

6. A method for preparing a radiolabeled compound targeting prostate specific membrane antigen, wherein the method comprises the following steps: dissolving the compound shown in Formula (II-1) according to claim 1 in a buffer solution or deionized water; and adding a radionuclide solution to a resulting solution for a reaction under closed conditions for 5-40 min to produce a radionuclide labeled complex;

or the method comprises the following steps: dissolving an appropriate amount of the compound shown in Formula (II-1) according to claim 1 in a buffer solution or deionized water; treating the obtained solution to aseptic filtration, followed by loading into a container, freeze-drying and sealing with a stopper to obtain a freeze-dried medicine box; and then adding an appropriate amount of an acetic acid solution or a buffer solution to the freeze-dried medicine box for dissolution, and adding a corresponding radionuclide solution for a reaction under closed conditions for 5-40 min to produce a radionuclide labeled complex.

7. A pharmaceutical composition, comprising the compound according to claims 1 or a radiolabeled compound targeting prostate specific membrane antigen according to any one of claim 3-5 and a pharmaceutically acceptable carrier.

8. The composition according to claim 7, wherein the pharmaceutically acceptable carrier is selected from an adhesive, a buffer, a colorant, a diluent, a disintegrator, an emulsifier, a flavoring agent, a flow aid, a lubricant, a preservative, a stabilizer, a surfactant, a tabletting agent, a wetting agent, or a combination thereof.

9. A method for diagnosis of prostate cancer in mammals, comprising administrating a therapeutic effective dose of the compound according to any one of claims 1, 3-5 to the mammals, wherein the compound is optionally combined with one or more of other active ingredients.

10. The method according to claim 9, wherein the one or more of other active ingredients are selected from one or more of other therapeutic compounds; and the other therapeutic compounds are further preferably selected from anticancer therapeutic compounds, and more preferably selected from adriamycin, paclitaxel, docetaxel, cisplatin, camptothecin, temozolomide, avastin, herceptin, erbitux, or a combination thereof.