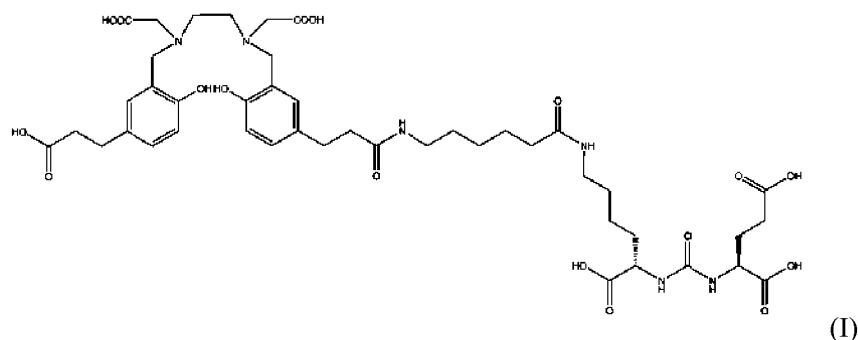


CLAIMS

1. A method for labeling a PSMA binding ligand with a radioactive isotope, preferably ^{68}Ga , ^{67}Ga or ^{64}Cu , said method comprising the steps of:

i. providing a single vial comprising, in dried form, said PSMA binding ligand of the following formula (I):



at least one buffering agent, sodium chloride and a stabilizer against radiolytic degradation,

ii. adding a solution of said radioactive isotope into said single vial, thereby obtaining a solution of said PSMA binding ligand of formula (I) with said radioactive isotope,

iii. mixing the solution obtained in ii., and incubating it for a sufficient period of time for obtaining said PSMA binding ligand labelled with said radioactive isotope, and,

iv. optionally, adjusting the pH of the solution.

2. The method of Claim 1, wherein said at least one buffering agent is sodium acetate.

3. The method of any one of Claim 1 or 2, wherein said single vial does not contain any bulking agent selected from the group consisting of carbohydrate and polymeric agent, preferably it does not contain any of the following bulking agents: mannitol, maltose, trehalose, polyvinylpyrrolidone, and mixtures thereof and the buffering agent is a buffer suitable for obtaining a pH from 3.0 to 6.0, at the incubating step (iii).

4. The method of any one of Claims 1-3, wherein said PSMA binding ligand of formula (I) is comprised in said single vial in an amount between 5 μg and 60 μg , preferably between 10 μg and 40 μg , more preferably between 15 μg and 30 μg , even more preferably about 25 μg .

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5. A solution comprising a PSMA binding ligand of formula (I) labelled with a radioactive isotope, obtainable or obtained by the method of any one of Claims 1-4, for use as an injectable solution for in vivo detection of tumors, preferably PSMA-expressing tumors, by imaging in a subject in need thereof.

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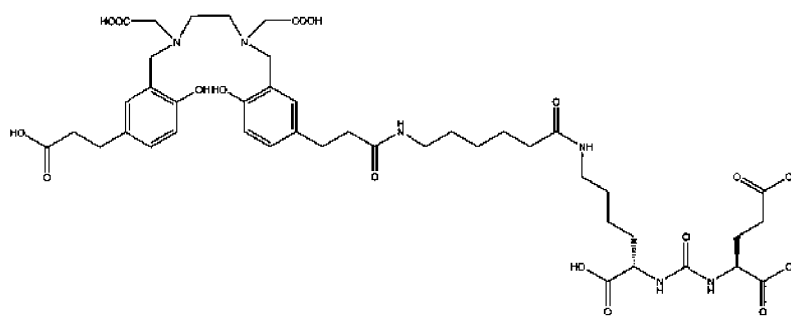
6. A solution according to claim 5 wherein the radioactive isotope is selected from the group consisting of ^{111}In , $^{133\text{m}}\text{In}$, $^{99\text{m}}\text{Tc}$, $^{94\text{m}}\text{Tc}$, ^{67}Ga , ^{66}Ga , ^{68}Ga , ^{67}Ga ^{52}Fe , ^{72}As , ^{97}Ru , ^{203}Pb , ^{62}Cu , ^{64}Cu , ^{86}Y , ^{51}Cr , $^{52\text{m}}\text{Mn}$, ^{157}Gd , ^{169}Yb , ^{172}Tm , $^{177\text{m}}\text{Sn}$, ^{89}Zr , ^{43}Sc , ^{44}Sc , ^{55}Co .

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7. A solution comprising PSMA binding ligand of formula (I) labelled with ^{68}Ga , ^{67}Ga or ^{64}Cu obtainable or obtained by the method of Claim 1-4, for use as an injectable solution for in vivo detection of tumors, preferably PSMA-expressing tumors, by imaging in a subject in need thereof.

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8. A powder for a solution for injection, comprising the following components in dried forms:
- i. a PSMA binding ligand of formula (I):



(I);

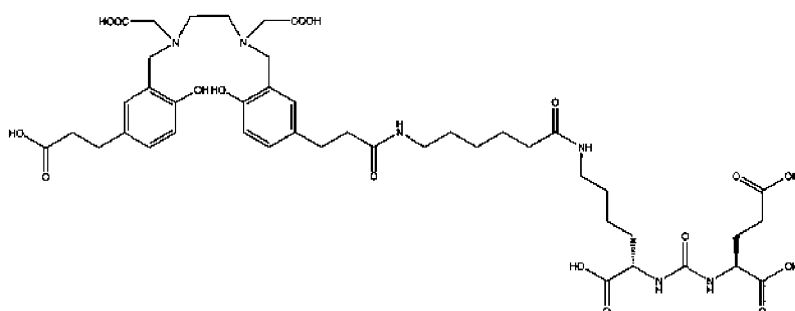
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- ii. sodium chloride;
- iii. at least one buffering agent, preferably sodium acetate and;

iv. a stabilizer against radiolytic degradation, preferably gentisic acid.

9. The powder for a solution for injection of Claim 8, comprising the following components:

- 5 i. a PSMA binding ligand of formula (I) in an amount between 5 μ g and 60 μ g, preferably between 10 μ g and 40 μ g, more preferably between 15 μ g and 30 μ g, even more preferably about 25 μ g;



(I), and

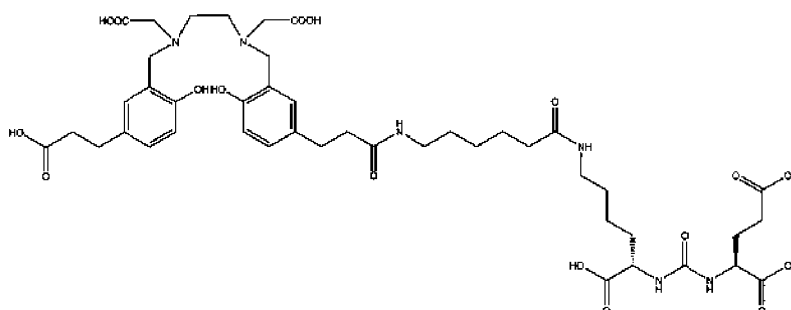
- 10 ii. sodium chloride in an amount of at least 10 mg, preferably between 10 mg and 100 mg, more preferably between 30 mg and 50 mg, even more preferably about 40 mg;
- 15 iii. sodium acetate in an amount of at least 20 mg, preferably between 20 mg and 80 mg, more preferably between 42 mg and 52 mg, even more preferably about 47 mg and;
- iv. gentisic acid in an amount of at least 0.2 mg, preferably between 0.5 mg and 2 mg, more preferably between 0.8 mg and 1.2 mg, even more preferably about 1 mg.

20 10. The powder for a solution for injection of any one of Claims 8 or 9, wherein said powder does not contain any bulking agent selected from the group consisting of carbohydrate and polymeric agent, preferably it does not contain any of the following bulking agents: mannitol, maltose, trehalose, polyvinylpyrrolidone and mixtures thereof.

11. A kit for carrying out the method of Claims 1-4, comprising

i. a single vial with the following components in dried forms

i. a PSMA binding ligand of formula (I):



(I), and

ii. sodium chloride;

iii. at least one buffering agent, preferably sodium acetate;

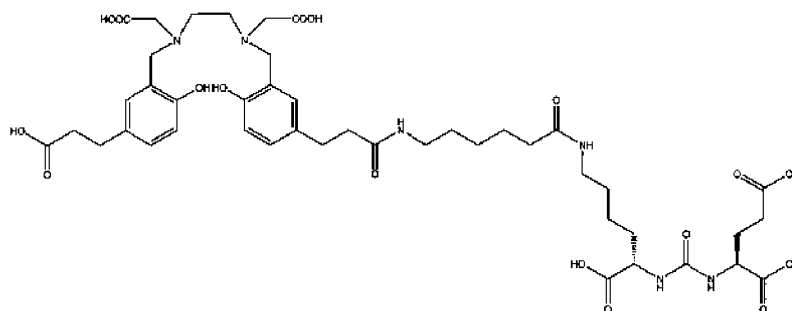
iv. a stabilizer against radiolytic degradation, preferably gentisic acid;

v. optionally, an accessory cartridge for eluting a radioactive isotope generated by a radioactive isotope generator or cyclotron.

12. A kit for carrying out the method of Claims 1-4, comprising

i. a single vial with the following components, preferably in dried forms:

i. a PSMA binding ligand of formula (I):



(I), and

ii. sodium chloride;

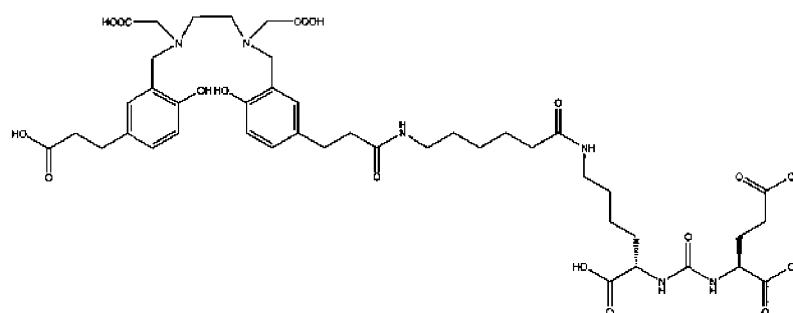
iii. sodium acetate;

iv. a stabilizer against radiolytic degradation, preferably gentisic acid, and;

v. optionally, an accessory cartridge for eluting a radioactive isotope generated by a radioactive isotope generator or cyclotron.

13. The kit of any one of Claim 11 or 12, wherein said single vial comprises, preferably in dried forms, the following components:

- i. a PSMA binding ligand of formula (I) in an amount between 5 μ g and 60 μ g, preferably between 10 μ g and 40 μ g, more preferably between 15 μ g and 30 μ g, even more preferably about 25 μ g;



(I), and

- ii. sodium chloride in an amount of at least 10 mg, preferably between 10 mg and 100 mg, more preferably between 30 mg and 50 mg, even more preferably about 40 mg;
- iii. sodium acetate in an amount of at least 20 mg, preferably between 20 mg and 80 mg, more preferably between 42 mg and 52 mg, even more preferably about 47 mg;
- iv. gentisic acid in an amount of at least 0.2 mg, preferably between 0.5 mg and 2 mg, more preferably between 0.8 mg and 1.2 mg, even more preferably about 1 mg, and;
- v. optionally, an accessory cartridge for eluting a radioactive isotope generated by a radioactive isotope generator or cyclotron.

14. The kit of any one of Claims 11-13, wherein said single vial comprises buffering agents suitable for maintaining a pH between 3.0 and 6.0.

15. The kit of any one of Claims 11-14, wherein the kit does not contain any bulking agent selected from the group consisting of carbohydrate and polymeric agent, preferably it does not contain any of the following bulking agents: mannitol, maltose, trehalose, polyvinylpyrrolidone and mixtures thereof.