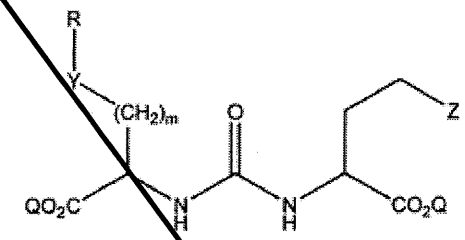
CLAIMS

1. A compound having the structure



wherein

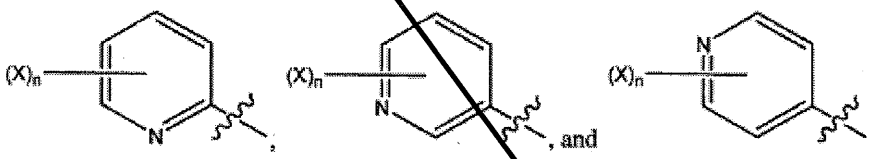
Z is tetrazole or CO_2Q;

each Q is independently selected from hydrogen or a protecting group; and

wherein

(A) m is 1, 2, 3 or 4;

R is a pyridine ring selected from the group consisting of



wherein X is fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, chlorine, bromine, a radioisotope of bromine, a radioisotope of astatine, NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, $B(OH)_2$, -NHNH$_2$, -NHN=CHR^3, -NHNH-CH$_2$R^3;

n is 1, 2, 3, 4, or 5;

Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, $NR'(CH_2)_p$, $O(CH_2)_P$, OC(O)CHR^{8}NHC(O), NHC(O)CHR^{8}NHC(O), or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

R^2 is C_1-C_6 alkyl; and

R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, chlorine, bromine, a radioisotope of bromine, or a radioisotope of astatine, NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, or $B(OH)_2$;

OR

(B) m is 1, 2, 3 or 4;

Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR', NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, NR' $(CH_2)_p$, $O(CH_2)_p$, $OC(O)CHR^8NHC(O)$, $NHC(O)CHR^8NHC(O)$, or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen alkyl, aryl or heteroaryl, each of which may be substituted;

R is



wherein

X^1 is selected from the group consisting of $NHNH_2$, $-NHN=CHR^3$, and $-NHNH-CH_2R^3$; wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, bromine, a radioisotope of bromine, or a radioisotope of astatine; NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, or $B(0H)_2$;

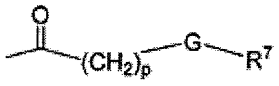
R^2 is C_1-C_6 alkyl;

n is 1, 2, 3, 4, or 5; OR

(C) m is 4,

Y is NR', and

R is



wherein

G is O, NR' or a covalent bond;

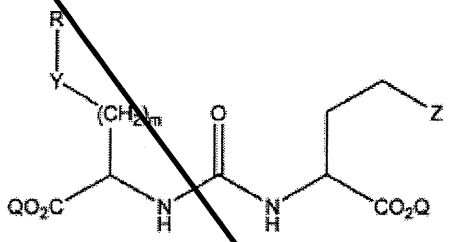
R' is H or C_1-C_6 alkyl;

p is 1, 2, 3, or 4, and

R^7 is selected from the group consisting of NH_2, $N=CHR^3$, $NH-CH_2R^3$, wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, chlorine, bromine, a radioisotope of

bromine, or a radioisotope of astatine, NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, $B(OH)_2$; and R^2 is C_1-C_6 alkyl.

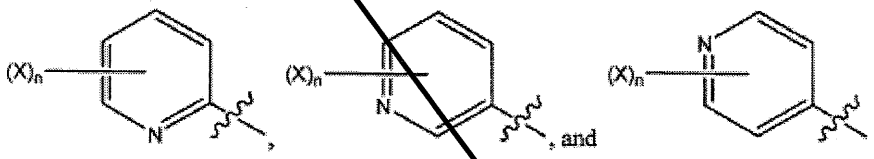
2. A compound according to claim 1, having the structure



wherein

m is 0, 1, 2, 3, 4, 5 or 6;

R is a pyridine ring selected from the group consisting of



wherein X is fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, chlorine, bromine, a radioisotope of bromine, a radioisotope of astatine, NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, $B(OH)_2$, $-NHNH_2$, $-NHN=CHR^3$, and $-NHNH-CH_2R^3$;

each Q is independently selected from hydrogen or a protecting group;

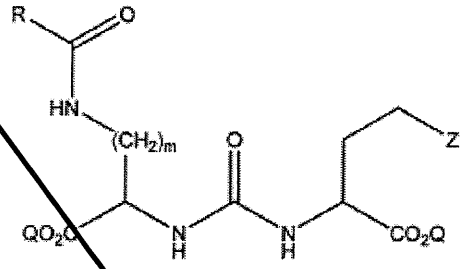
Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR', NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, $NR'(CH_2)_p$, $O(CH_2)_p$, $OC(O)CHR^8NHC(O)$, $NHC(O)CHR^8NHC(O)$, or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

Z is tetrazole or CO_2Q;

R^2 is C_1-C_6 alkyl; and

R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl, each of which is substituted by fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, chlorine, bromine, a radioisotope of bromine, or a radioisotope of astatine; NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, or $B(OH)_2$.

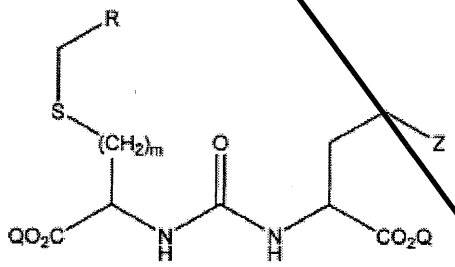
3. A compound according to claim 2, having the structure



wherein m is not 0.

4. A compound according to claim 3, where Z is CO_2Q, Q is hydrogen, and m is 4.

5. A compound according to claim 2, having the structure



wherein m is not 0.

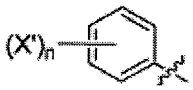
6. A compound according to claim 5, where Z is CO_2Q, Q is hydrogen, and m is 1, 2, or 3.

7. A compound according to claim 1, wherein

m is 0, 1, 2, 3, 4, 5 or 6;

Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR', NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, $NR'(CH_2)_p$, $O(CH_2)_p$, $OC(O)CHR^8NHC(O)$, $NHC(O)CHR^8NHC(O)$, or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

R is



wherein

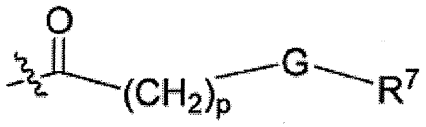
X' is selected from the group consisting of $NHNH_2$, $-NHN=CHR^3$, $-NHNH-CH_2R^3$; wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl, each of which is substituted by fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, bromine, a radioisotope of bromine, or a radioisotope of astatine; NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, and $B(OH)_2$, where R^2 is C_1-C_6 alkyl;
n is 1, 2, 3, 4, or 5.

8. A compound according to any one of claims 1-7, wherein n is 1.

9. A compound according to any one of claims 1-8, wherein X or X' is fluorine, iodine, or a radioisotope of fluorine or iodine, bromine, a radioisotope of bromine, or a radioisotope of astatine.

10. A compound according to any one of claims 1-8, wherein X or X' is fluorine, iodine, or a radioisotope of fluorine or iodine.

11. A compound according to claim 1, wherein m is 4, Y is NR', and R is



wherein G is O, NR' or a covalent bond,
p is 1, 2, 3, or 4, and
R^7 is selected from the group consisting of NH_2, $N=CHR^3$, $NH-CH_2R^3$, wherein R^3 is alkyl, alkenyl, alkynyl, aryl, heteroaryl each of which is substituted by fluorine, iodine, a radioisotope of fluorine, a radioisotope of iodine, chlorine bromine, a radioisotope of

bromine, or a radioisotope of astatine NO_2, NH_2, $N^+(R^2)_3$, $Sn(R^2)_3$, $Si(R^2)_3$, $Hg(R^2)$, and $B(OH)_2$, wherein R^2 is C_1-C_6 alkyl.

12. A compound according to claim 11, wherein G is O or NR'.

13. A compound according to any one of claims 1-12, wherein R comprises a radioisotope.

14. A compound according to claim 13, wherein the radioisotope is selected from the group consisting of ^{18}F, ^{123}I, ^{124}I, ^{125}I, ^{126}I, ^{131}I, ^{75}Br, ^{76}Br, ^{77}Br, ^{80}Br, ^{80m}Br, ^{82}Br, ^{83}Br and ^{211}At.

15. A method of imaging one or more cells, organs or tissues comprising exposing the cell to or administering to a organism an effective amount of a compound according to any one of claims 13-14.

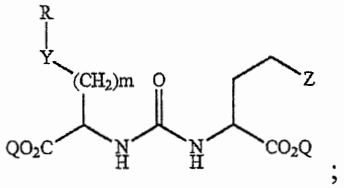
16. The method according to claim 15 , wherein the one or more organs or tissues includes prostate tissue, kidney tissue, brain tissue vascular tissue or tumor tissue.

17. A method of treating a tumor comprising administering a therapeutically effective amount of a compound according to any one of claims 1-14 comprising a therapeutically effective radioisotope.

18. A kit comprising a compound according to any one of claims 1-14.

IN THE CLAIMS:

1. A compound for use in imaging one or more cells, organs or tissues, the compound having the structure:



;

wherein

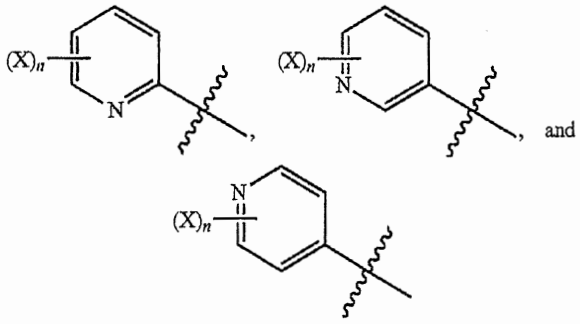
Z is tetrazole or CO_2Q;

each Q is independently selected from hydrogen or a protecting group; and

wherein

(A) m is 1, 2, 3 or 4;

R is a pyridine ring selected from the group consisting of



and

wherein X is a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, a radioisotope of astatine;

n is 1, 2, 3, 4, or 5;

Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, $NR'(CH_2)_p$, $O(CH_2)_p$, $OC(O)CHR^8NHC(O)$, $NHC(O)CHR^8NHC(O)$,

or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

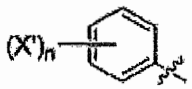
R^2 is C_1-C_6 alkyl; and

R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine;

OR

(B) m is 1, 2, 3 or 4; Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', NR'$S(O)_2$, $S(CH_2)_p$, NR'$(CH_2)_p$, O$(CH_2)_p$, OC(O)CHR^{8}NHC(O), NHC(O)CHR^{8}NHC(O), or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

R is



wherein

X' is selected from the group consisting of $NHNH_2$, -NHN=CHR^3, and -NHNH-CH_2R^3;

wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine;

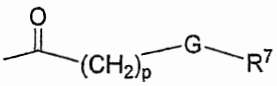
R^2 is C_1-C_6 alkyl;

n is 1, 2, 3, 4, or 5; OR

(C) m is 4,

Y is NR', and

R is



wherein

G is O, NR' or a covalent bond;

R' is H or C_1-C_6 alkyl;

p is 1, 2, 3, or 4, and

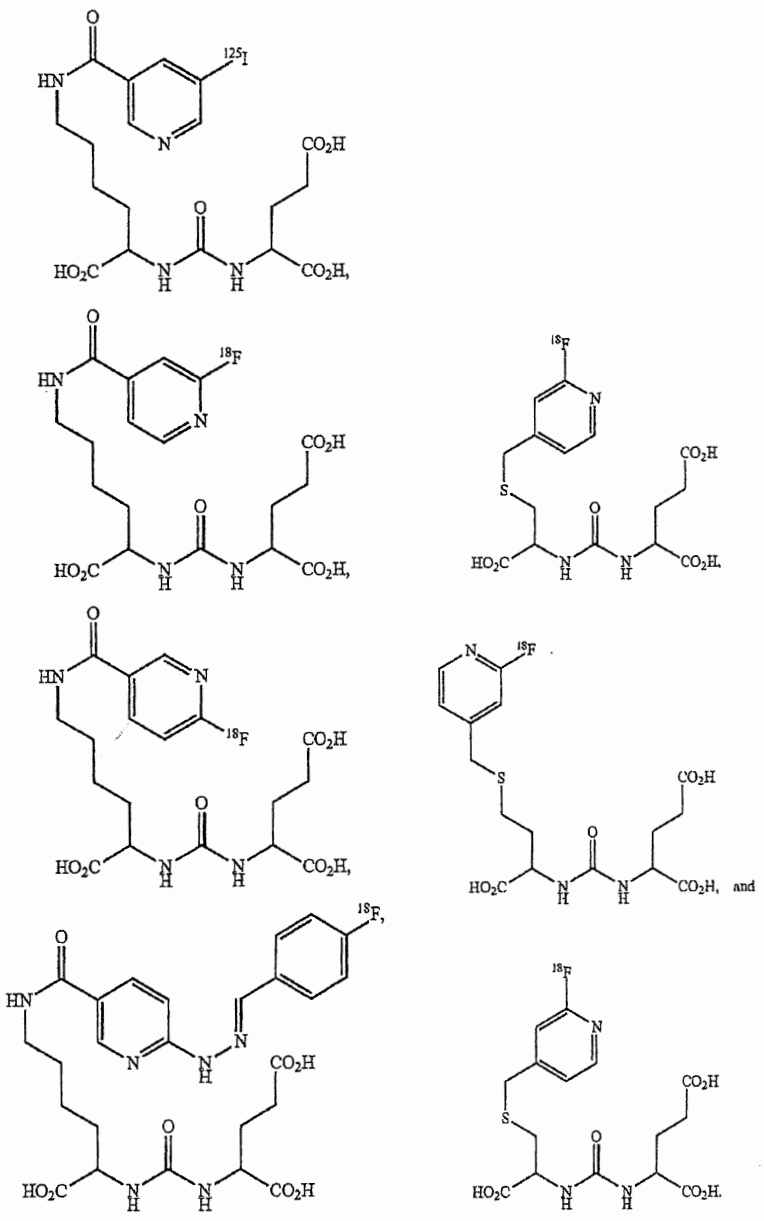
R^7 is selected from the group consisting of NH_2, N=CHR^3, NH-CH2R^3, wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine; and R^2 is C_1-C_6 alkyl.

2. The compound of claim 1, wherein Z is CO_2Q.

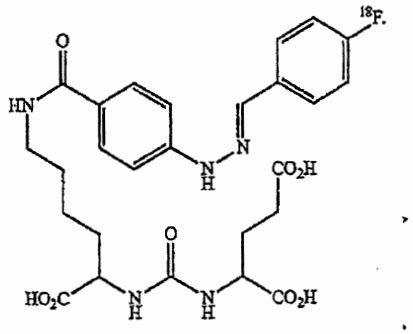
3. The compound of claim 1 or 2, wherein Q is hydrogen.

4. The compound of claim 1 or 2, wherein the radioisotope is selected from the group consisting of ^{18}F, ^{123}I, ^{124}I, ^{125}I, ^{126}I, ^{131}I, ^{75}Br, ^{76}Br, ^{77}Br, ^{80}Br, ^{80m}Br, ^{82}Br, ^{83}Br and ^{211}At.

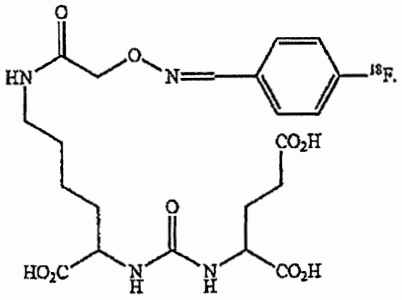
5. The compound of claim 1, wherein the compound is selected from the group consisting of



6. The compound of claim 1, wherein the compound is

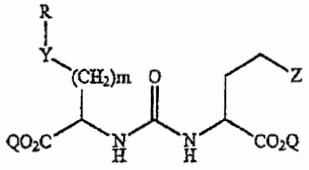


7. The compound of claim 1, wherein the compound is



8. The compound of claim 1, wherein the one or more organ or tissues includes prostate tissue, kidney tissue, brain tissue vascular tissue or tumor tissue.

9. A compound having the structure:



for use in the treatment of a tumor,
wherein

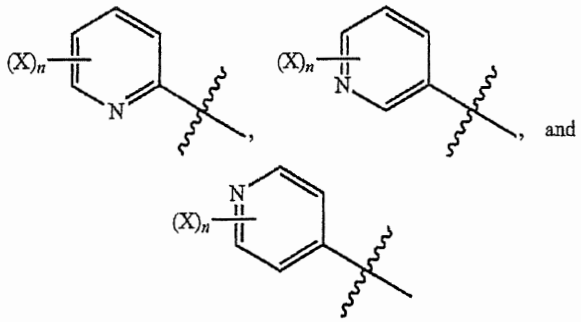
Z is tetrazole or CO_2Q;

each Q is independently selected from hydrogen or a protecting group; and

wherein

(A) m is 1, 2, 3 or 4;

R is a pyridine ring selected from the group consisting of



wherein X is a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, a radioisotope of astatine;

n is 1, 2, 3, 4, or 5;

Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', NR'$S(O)_2$, $S(CH_2)_p$, NR'$(CH_2)_p$, $O(CH_2)_p$, OC(O)CHR^8NHC(O), NHC(O)CHR^8NHC(O), or a covalent bond;

wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

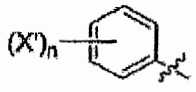
R^2 is C_1-C_6 alkyl; and

R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine;

OR

(B) m is 1, 2, 3 or 4; Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', NR'$S(O)_2$, $S(CH_2)_p$, NR'$(CH_2)_p$, $O(CH_2)_p$, OC(O)CHR^8NHC(O), NHC(O)CHR^8NHC(O), or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

R is



wherein

X' is selected from the group consisting of $NHNH_2$, -NHN=CHR^3, and -NHNH-CH_2R^3;

wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine;

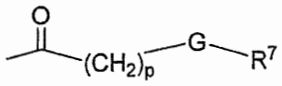
R^2 is C_1-C_6 alkyl;

n is 1, 2, 3, 4, or 5; OR

(C) m is 4,

Y is NR', and

R is



wherein

G is O, NR' or a covalent bond;

R' is H or C_1-C_6 alkyl;

p is 1, 2, 3, or 4, and

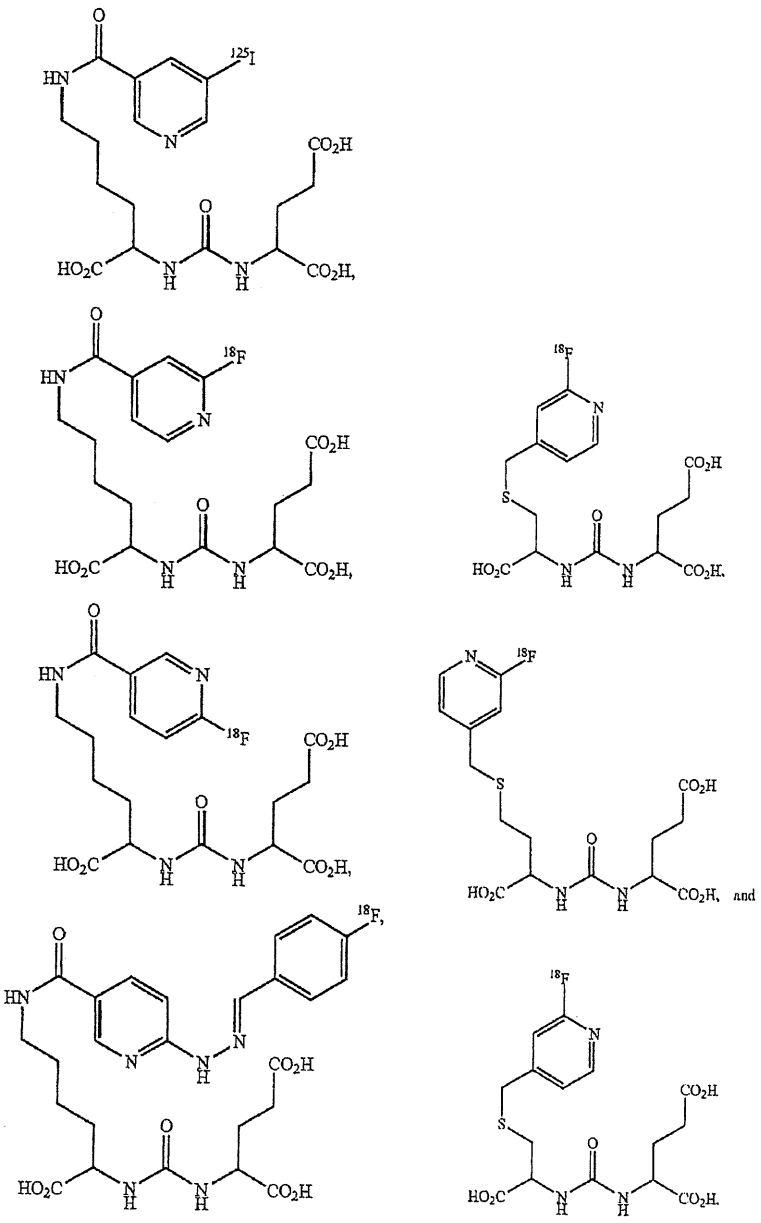
R^7 is selected from the group consisting of NH_2, $N=CHR^3$, $NH\text{-}CH_2R^3$, wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, chlorine, bromine, a radioisotope of bromine, or a radioisotope of astatine; and R^2 is C_1-C_6 alkyl.

10. The compound of claim 9, wherein Z is CO_2Q.

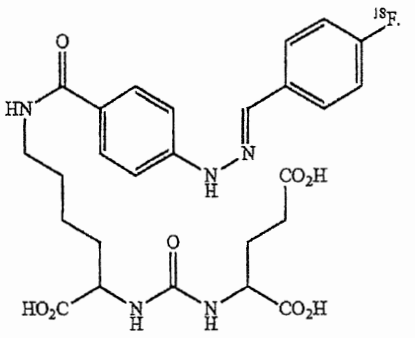
11. The compound of claim 9 or 10, wherein Q is hydrogen.

12. The compound of claim 9 or 10, wherein the radioisotope is selected from the group consisting of ^{18}F, ^{123}I, ^{124}I, ^{125}I, ^{126}I, ^{131}I, ^{75}Br, ^{76}Br, ^{77}Br, ^{80}Br, ^{80m}Br, ^{82}Br, ^{83}Br and ^{211}At.

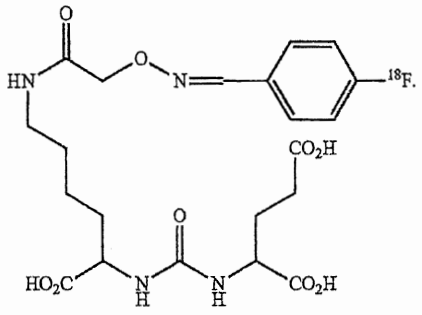
13. The compound of claim 9, wherein the compound is selected from the group consisting of



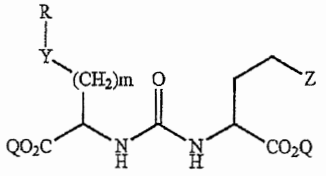
14. The compound of claim 9, wherein the compound is



15. The compound of claim 9, wherein the compound is



16. A compound for the preparation of a kit, having the structure



wherein

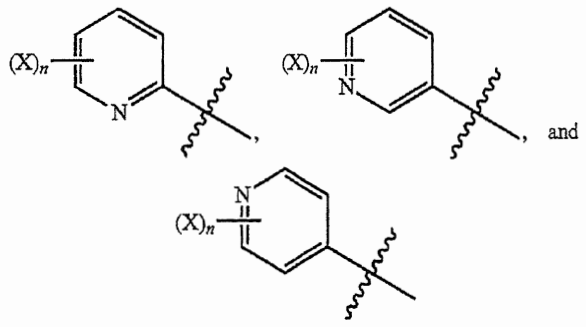
Z is tetrazole or CO_2Q;

each Q is independently selected from hydrogen or a protecting group; and

wherein

(A) m is 1, 2, 3 or 4;

R is a pyridine ring selected from the group consisting of



wherein X is a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, a radioisotope of astatine;

n is 1, 2, 3, 4, or 5;

Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, $NR'(CH_2)_p$, $O(CH_2)_p$, $OC(O)CHR^8NHC(O)$, $NHC(O)CHR^8NHC(O)$, or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

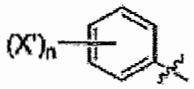
R^2 is C_1-C_6 alkyl; and

R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine;

OR

(B) m is 1, 2, 3 or 4; Y is O, S, N(R'), C(O), NR'C(O), C(O)N(R'), OC(O), C(O)O, NR'C(O)NR, NR'C(S)NR', $NR'S(O)_2$, $S(CH_2)_p$, $NR'(CH_2)_p$, $O(CH_2)_p$, $OC(O)CHR^8NHC(O)$, $NHC(O)CHR^8NHC(O)$, or a covalent bond; wherein p is 1, 2, or 3, R' is H or C_1-C_6 alkyl, and R^8 is hydrogen, alkyl, aryl or heteroaryl, each of which may be substituted;

R is



wherein

X' is selected from the group consisting of $NHNH_2$, $-NHN=CHR^3$, and $-NHNH-CH_2R^3$;

wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine;

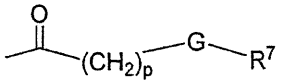
R^2 is C_1-C_6 alkyl;

n is 1, 2, 3, 4, or 5; OR

(C) m is 4,

Y is NR', and

R is



wherein

G is O, NR' or a covalent bond;

R' is H or C_1-C_6 alkyl;

p is 1, 2, 3, or 4, and

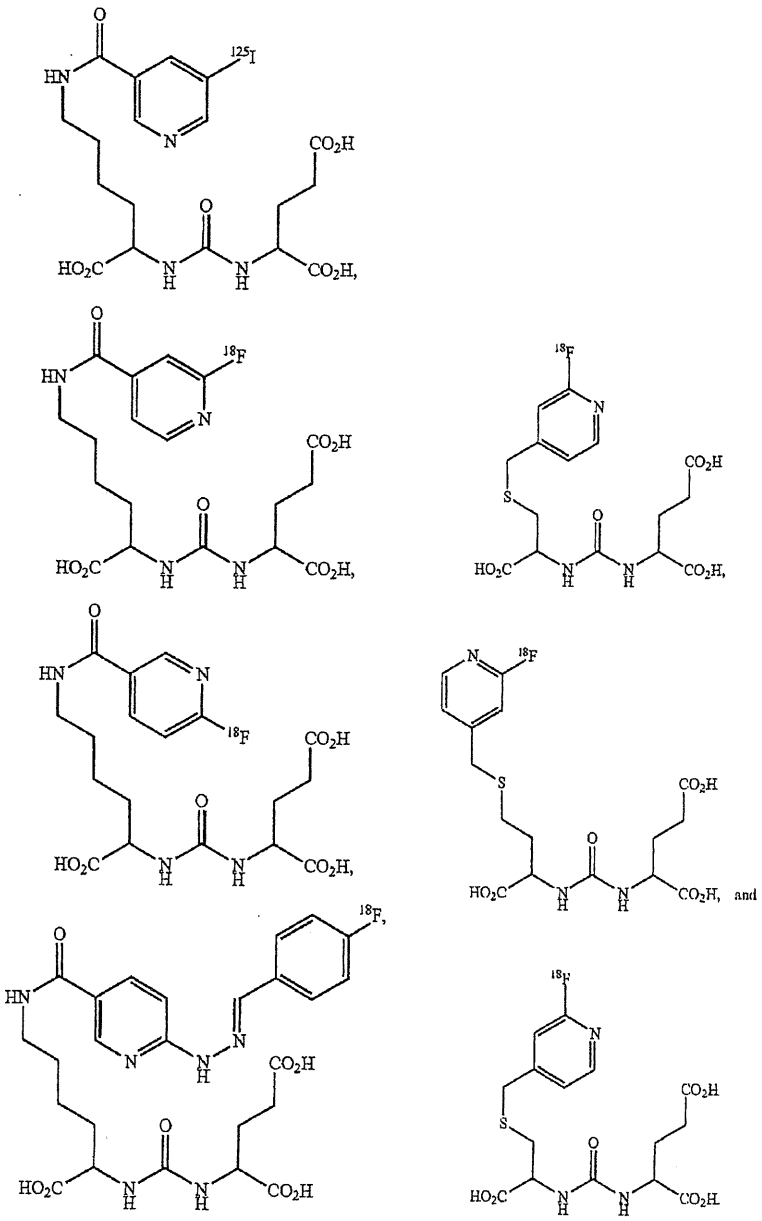
R^7 is selected from the group consisting of NH_2, $N=CHR^3$, NH-CH2R^3, wherein R^3 is alkyl, alkenyl, alkynyl, aryl, or heteroaryl each of which is substituted by a radioisotope of fluorine, a radioisotope of iodine, a radioisotope of bromine, or a radioisotope of astatine; and R^2 is C_1-C_6 alkyl.

17. The compound of claim 16, wherein Z is CO_2Q.

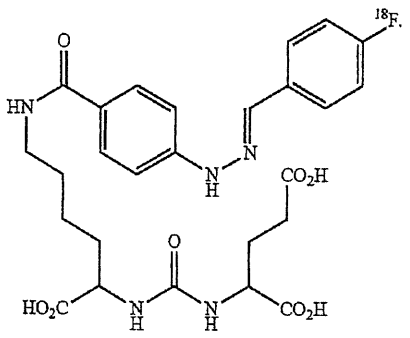
18. The compound of claim 16 or 17, wherein Q is hydrogen.

19. The compound of claim 17 or17, wherein the radioisotope is selected from the group consisting of ^{18}F, ^{123}I, ^{124}I, ^{125}I, ^{126}I, ^{131}I, ^{75}Br, ^{76}Br, ^{77}Br, ^{80}Br, ^{80m}Br, ^{82}Br, ^{83}Br and ^{211}At.

20. The compound of claim 16, wherein the compound is selected from the group consisting of



21. The compound of claim 16, wherein the compound is



22. The compound of claim 16, wherein the compound is

