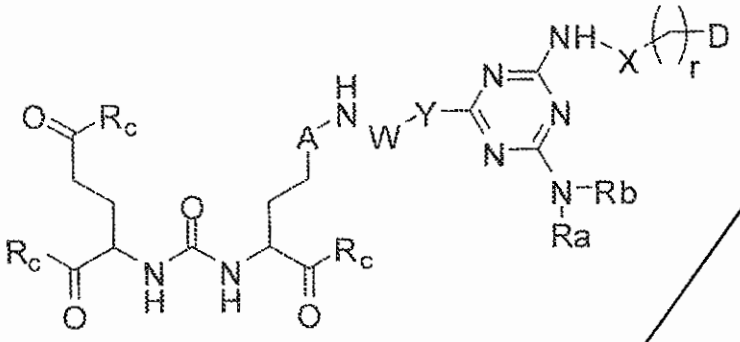
WHAT IS CLAIMED IS:

1. A compound according to formula I

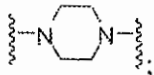


I

wherein:

A is $(CHR^1)_m$ or C(O);

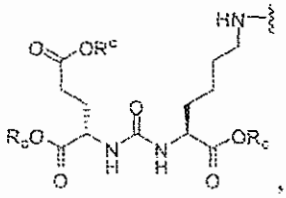
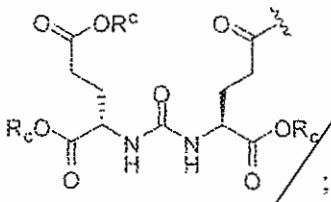
W is –C(O)–$(CH_2)_p$–; -C(O)[-CH_2-CH_2-O]$_n$-, -[CH_2-CH_2-O]$_n$-$(CH_2)_2$-, –C(O)-[$CH(R^3)_l]_q$-, -$(CH_2)_m$-O-$(CH_2)_n$-, -$(CH_2)_m$-S-$(CH_2)_n$-, -$(CH_2)_m$-S(O)-$(CH_2)_n$-, -$(CH_2)_m$-$S(O)_2$-$(CH_2)_n$-, or -$(CH_2)_m$-NR_a-$(CH_2)_n$-,

Y is –NH-, -NR^2-, or ;

X is –(C_1-C_{10})alkylene-(C_3-C_{10})arylene, -(C_3-C_{10})arylene, -(C_3-C_{10})arylene–(C_1-C_{10})alkylene-, phenylene, –(C_1-C_{10})alkylene-(C_3-C_{10})cycloalkylene, -(C_3-C_{10})cycloalkylene, or -(C_3-C_{10})cycloalkylene–(C_1-C_{10})alkylene-;

R^1 and R^2 are each independently H, -(C_1-C_{10})alkyl, –C(O)-(C_1-C_{10})alkyl, benzyl, -(C_3-C_{10})cycloalkyl, or -(C_3-C_{10})aryl;

R^a and R^b are each independently H, -OH, -(C_1-C_{10})alkyl, -[CH_2-CH_2-O]$_n$-$(CH_2)_2$-T, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-Z, benzyl, -(C_3-C_{10})cycloalkyl, -(C_3-C_{10})aryl-(C_1-C_{10})alkylene, -(C_3-C_{10})aryl, halo-(C_1-C_{10})alkyl, hydroxy-(C_1-C_{10})alkyl, -NH–(C_1-C_{10})alkyl, or -(C_1-C_{10})alkylene-NR^dR^e-, or R^a and R^b together with the nitrogen to which they are bonded form a (C_3-C_6)-heteroaryl or (C_3-C_6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is –OH, -O(C_1-C_{10})alkyl,  , or  ;

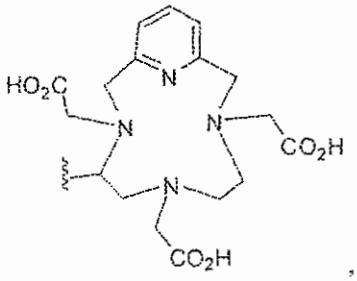
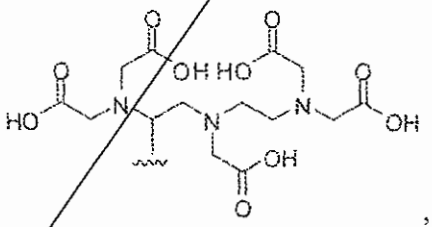
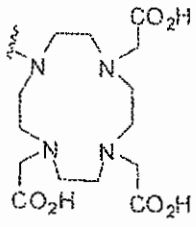
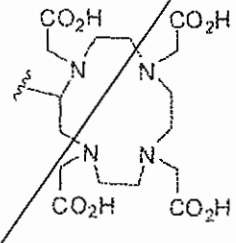
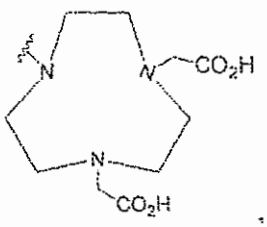
R^c is -OH, -O(C_1-C_{10})alkyl, -Obenzyl, -O(C_3-C_{10})cycloalkyl, -O(C_3-C_{10})aryl, -O-(C_1-C_{10})alkylene-(C_3-C_{10})aryl, or -O-(C_1-C_{10})alkylene--(C_3-C_{10})cycloalkyl,

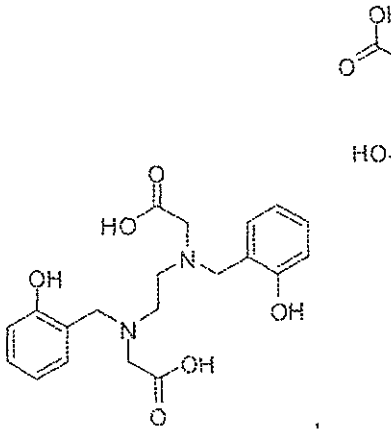
R^3 is H, halogen, -OH, $-NH_2$, $-(CH_2)_p$-COOH, or $-(CH_2)_p$- NH_2;

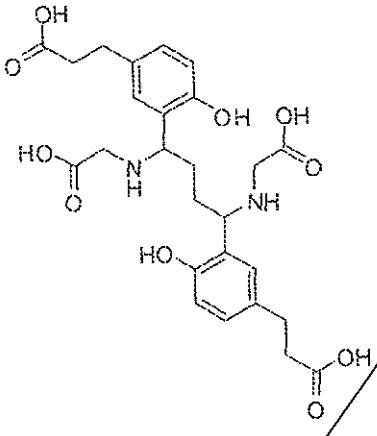
T is –H, –OH, -COOH, or $-NR^dR^e$;

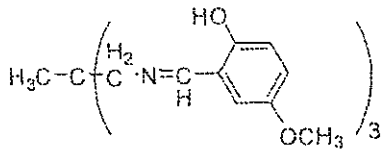
R^d and R^e are each independently H, bond, -OH, -(C_1-C_{10})alkyl, or -(C_3-C_{10})heteroaryl-(C_1-C_{10})alkylene;

m, n, p, q, t and r are each independently 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10; and

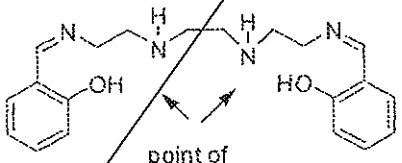
D is  ,  ,  ,  ,  .







H_3[5-MeOsal)$_3$ TAME]

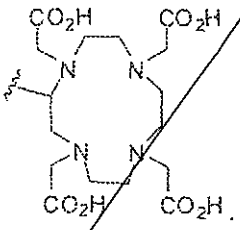


point of attachment to linker

, or ;

wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or 3 substituent groups selected from the group consisting of -(C_1-C_{10})alkyl, -(C_1-C_{10})haloalkyl, -(C_1-C_{10}) aminoalkyl, -(C_1-C_{10})alkylene-COOH, -(C_1-C_{10})hydroxyalkyl, -OH, halogen, -NH_2, -COOH, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-X, -NH--(C_1-C_{10})alkyl, and -(C_1-C_{10})alkylene-NR^dR^e-, and –NR^dR^e.

2. The compound of Claim 1, wherein X is phenylene, r is 1 and D is



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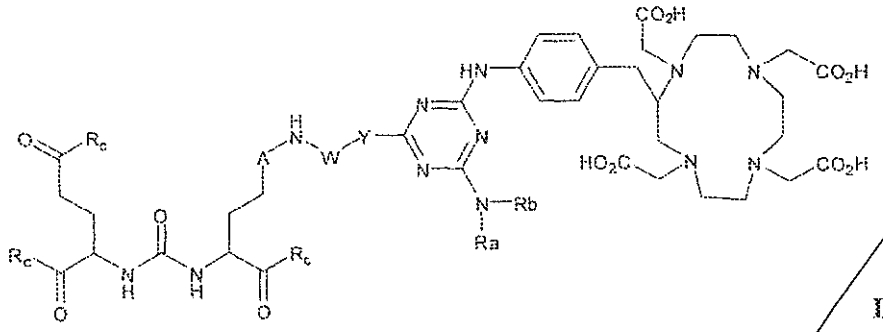
3. The compound of Claim 2, wherein the compound is a compound according to Formula II

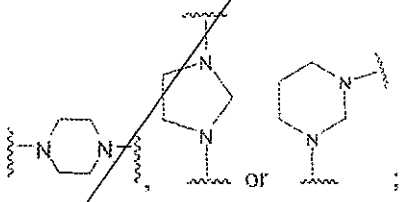


II

wherein:

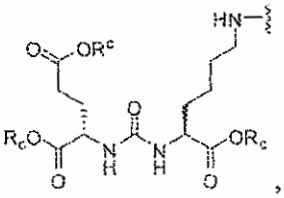
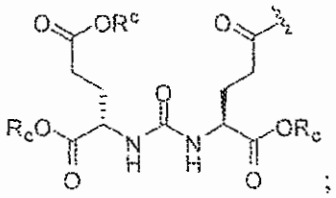
A is $(CHR^1)_m$ or C(O);

W is selected from the group consisting of $-C(O)-(CH_2)_p-$; $-C(O)[-CH_2-CH_2-O]_n-$, $-[CH_2-CH_2-O]_n-(CH_2)_2-$, $-C(O)-[CH(R^3)_t]_q-$, $-(CH_2)_m-O-(CH_2)_n-$, $-(CH_2)_m-S-(CH_2)_n-$, $-(CH_2)_m-S(O)-(CH_2)_n-$, $-(CH_2)_m-S(O)_2-(CH_2)_n-$, and $-(CH_2)_m-NR_a-(CH_2)_n-$,

Y is selected from –NH-, $-NR^2-$, ;

R^1 and R^2 are each independently selected from H, $-(C_1-C_{10})$alkyl, $-C(O)-(C_1-C_{10})$alkyl, benzyl, $-(C_3-C_{10})$cycloalkyl, or $-(C_3-C_{10})$aryl;

R^a and R^b are each independently selected from the group consisting of H, -OH, $-(C_1-C_{10})$alkyl, $-[CH_2-CH_2-O]_n-(CH_2)_2-T$, $-C(O)-(C_1-C_{10})$alkyl, $-(C_1-C_{10})$alkylene-C(O)-, $-(C_1-C_{10})$alkylene-C(O)-Z, benzyl, $-(C_3-C_{10})$cycloalkyl, $-(C_3-C_{10})$aryl-(C_1-C_{10})alkylene, $-(C_3-C_{10})$aryl, halo-(C_1-C_{10})alkyl, hydroxy-(C_1-C_{10})alkyl, -NH-(C_1-C_{10})alkyl, and $-(C_1-C_{10})$alkylene-NR^dR^e-, or R^a and R^b together with the nitrogen to which they are bonded form a (C_3-C_6)-heteroaryl or (C_3-C_6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is selected from –OH, -O(C_1-C_{10})alkyl, , or ;

R^c is selected from -OH, -O(C_1-C_{10})alkyl, -Obenzyl, -O(C_3-C_{10})cycloalkyl, -O(C_3-C_{10})aryl, -O-(C_1-C_{10})alkylene--(C_3-C_{10})aryl, or -O-(C_1-C_{10})alkylene--(C_3-C_{10})cycloalkyl,

R^3 is selected from H, halogen, -OH, $-NH_2$, $-(CH_2)_p$-COOH, or $-(CH_2)_p$- NH_2;

T is selected from –H, –OH, -COOH, or $-NR^dR^e$;

R^d and R^e are each independently selected from H, bond, -OH, -(C_1-C_{10})alkyl, or -(C_3-C_{10})heteroaryl-(C_1-C_{10})alkylene;

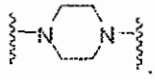
m, n, p, q, t and x are each independently 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10;

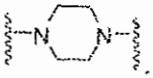
wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or 3 substituent groups selected from the group consisting of -(C_1-C_{10})alkyl, -(C_1-C_{10})haloalkyl, -(C_1-C_{10}) aminoalkyl, -(C_1-C_{10})alkylene-COOH, -(C_1-C_{10})hydroxyalkyl, $-NH_2$, -COOH, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-X, -NH--(C_1-C_{10})alkyl, and -(C_1-C_{10})alkylene-NR^dR^e-, and $-NR^dR^e$.

4. The compound of Claim 3, wherein A is $(CHR^1)_m$ and W is $-C(O)-(CH_2)_p$-.

5. The compound of Claim 4, wherein W is $-C(O)-(CH_2)_7$- or $-C(O)-(CH_2)_{10}$-.

6. The compound of Claim 4, wherein R^1 is hydrogen and m is 2.

7. The compound of Claim 3, wherein Y is –NH- or .

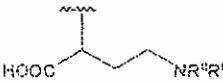
8. The compound of Claim 7, wherein Y is .

9. The compound of Claim 3, wherein R^a and R^b are each independently hydrogen or methyl and R^c is -OH.

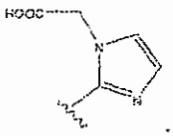
10. The compound of Claim 3, wherein R^a and R^b together with the nitrogen to which they are bonded form a $(C_3$-$C_6)$-heterocycloalkyl.

11. The compound of Claim 10, wherein the $(C_3$-$C_6)$-heterocycloalkyl is selected from piperidine, piperazine, morpholine, thiomorpholine, isothiazolidine, isoxazolidine, pyrrolidine, immidazolidine, thiazolidine or oxazolidine.

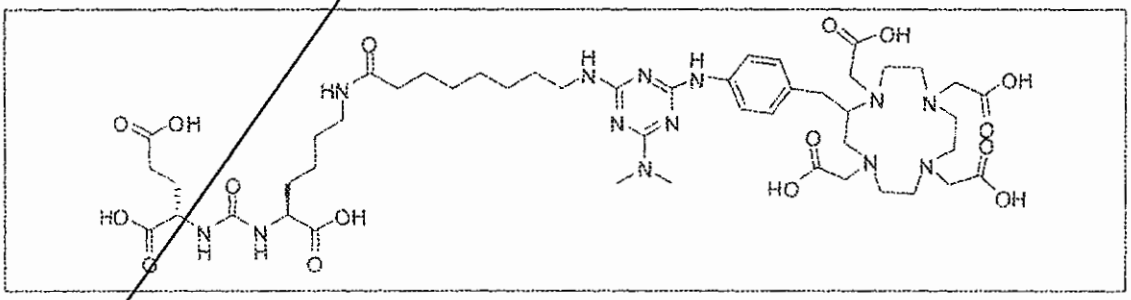
12. The compound of Claim 11, wherein the $(C_3$-$C_6)$-heterocycloalkyl is piperidine or 4-(piperidin-4-yl)butanoic acid.

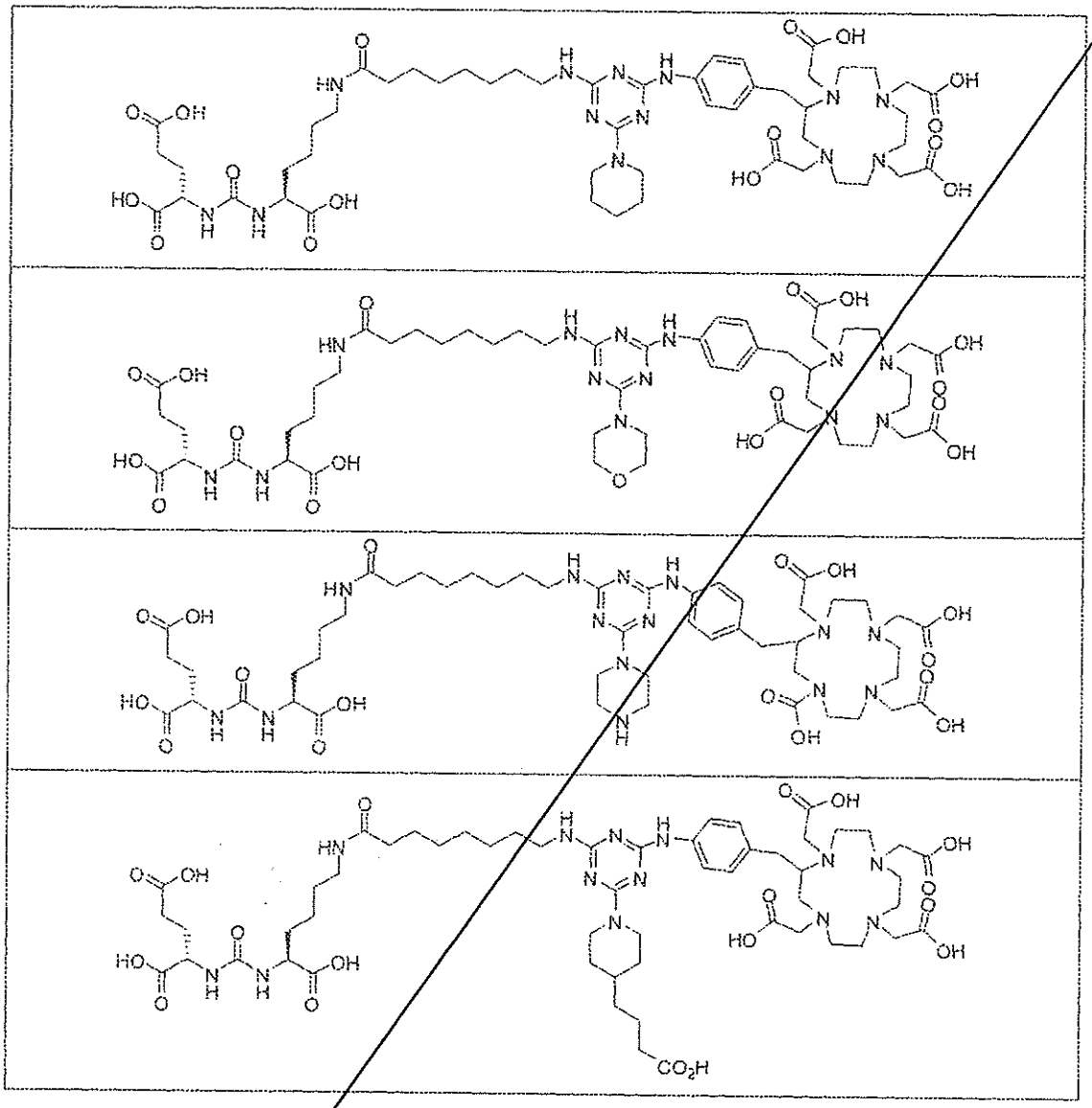
13. The compound of Claim 10, wherein R^a is -H and R^b is .

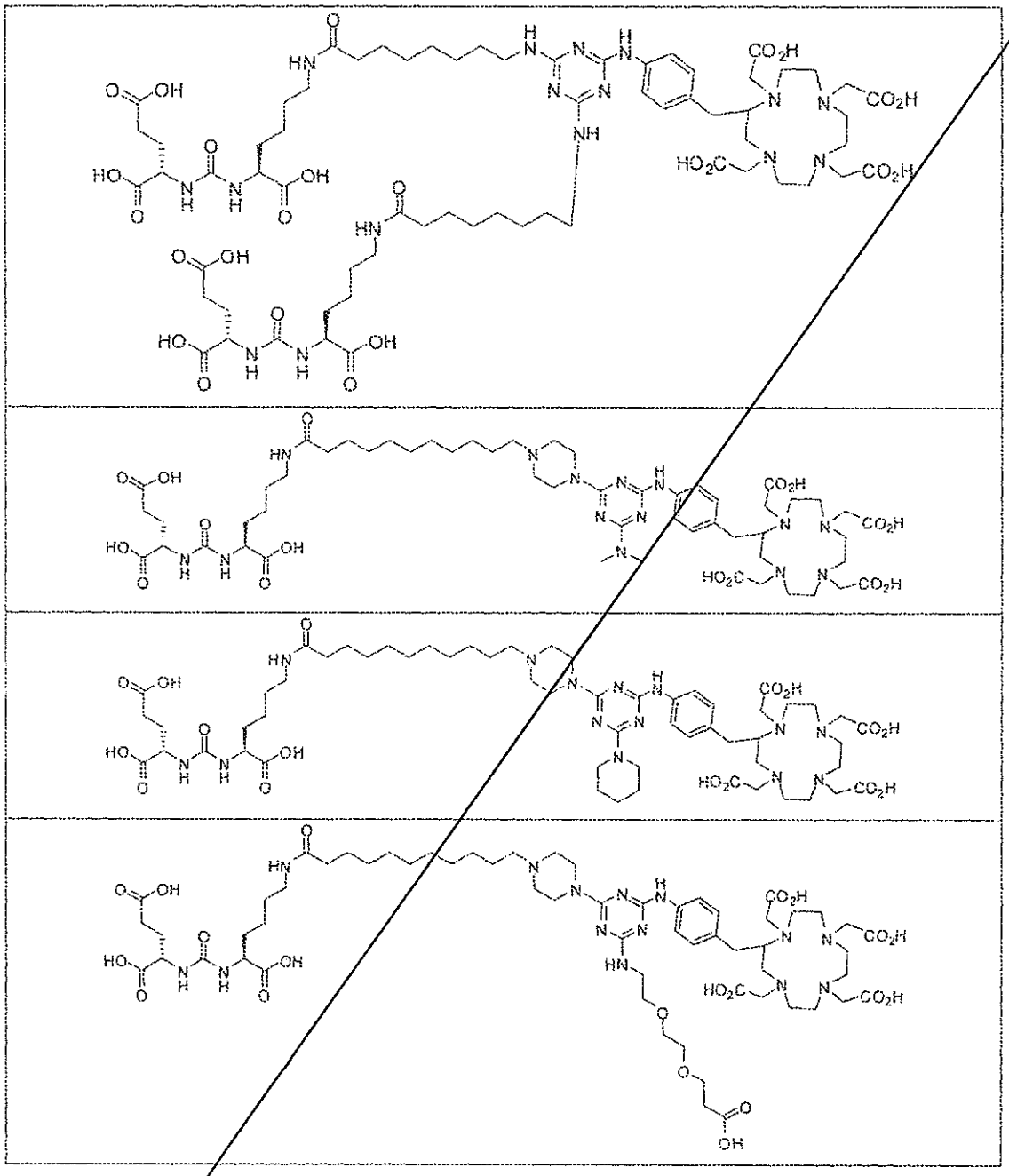
14. The compound according to claim 10, wherein R^d and R^e are each independently -$(C_3$-$C_{10})$heteroaryl-$(C_1$-$C_{10})$alkylene.

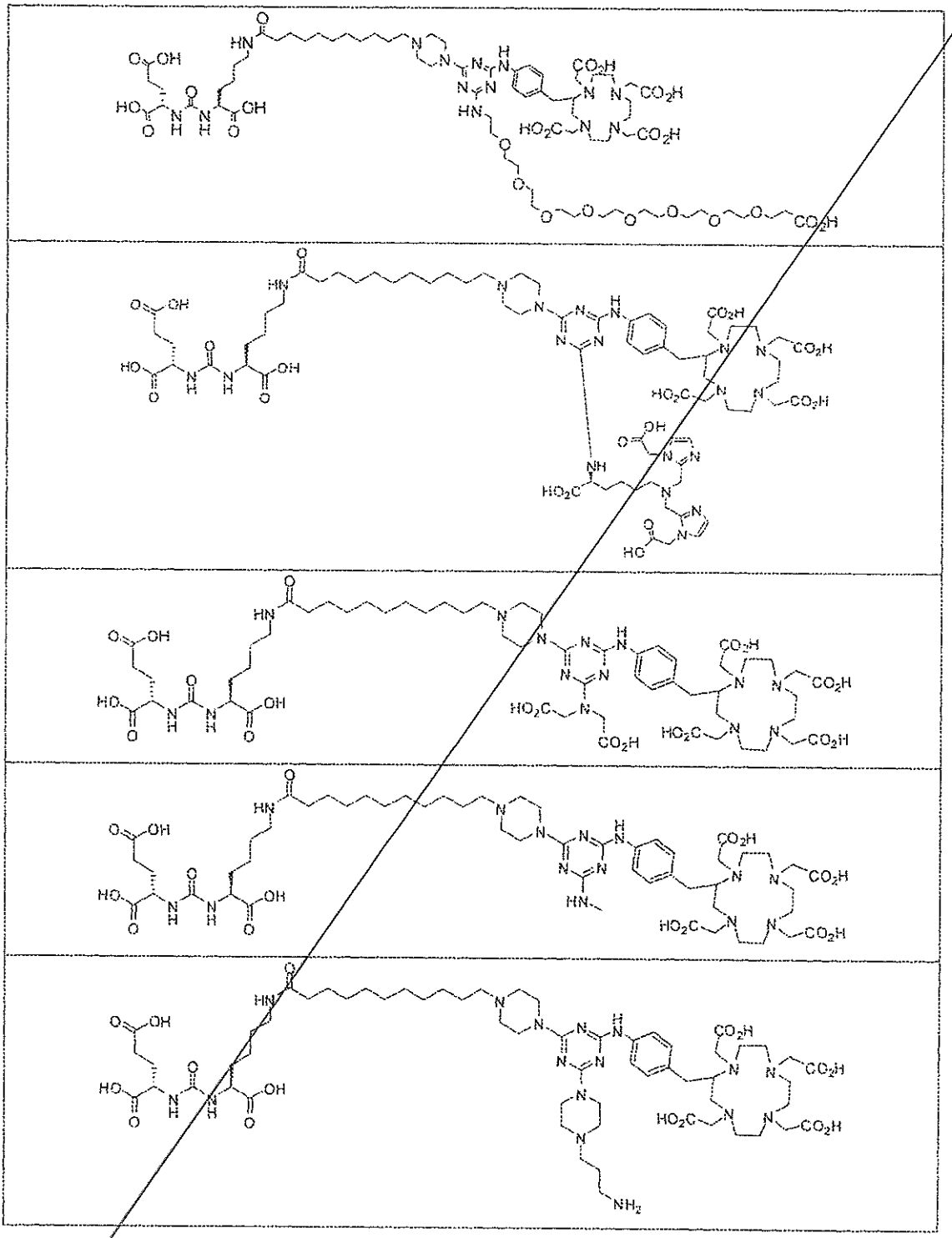
15. The compound of Claim 10, wherein R^d and R^e are each independently .

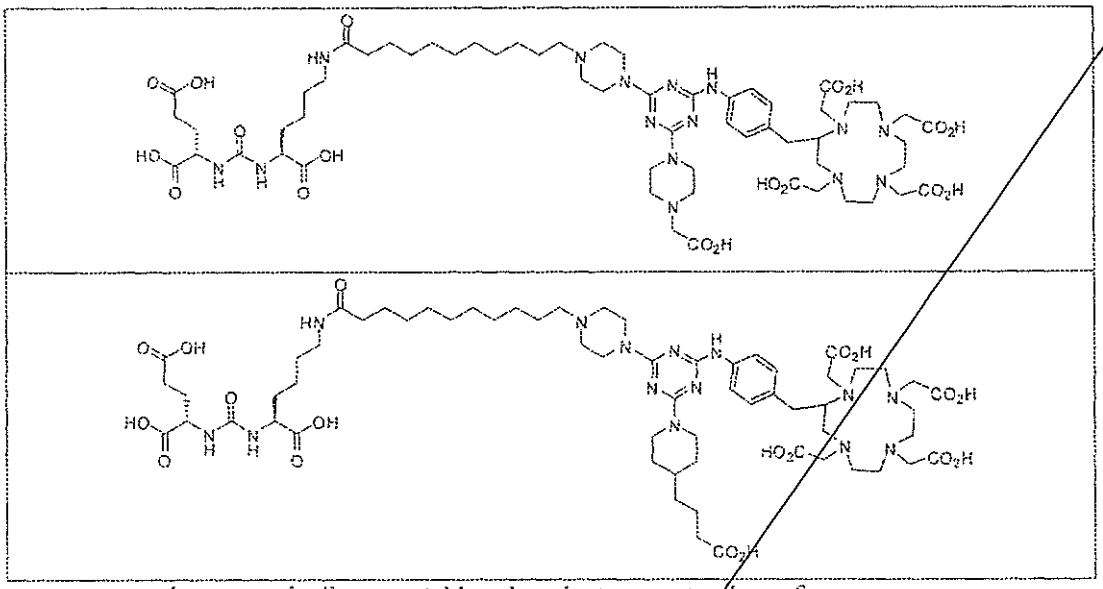
16. The compound of Claim 3, which is selected from the following compounds:







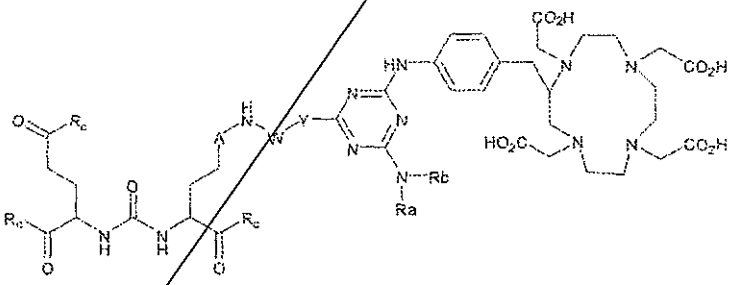




or a pharmaceutically acceptable salt, solvate, or ester thereof.

17. A metal complex comprising a radionuclide and a compound of Claim 1.

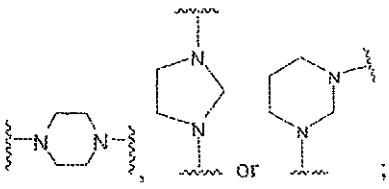
18. The metal complex of Claim 17, wherein the compound is



wherein:

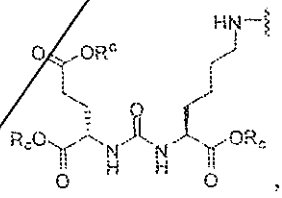
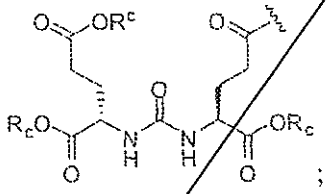
A is $(CHR^1)_m$ or C(O);

W is selected from the group consisting of $-C(O)-(CH_2)_p-$; $-C(O)[-CH_2-CH_2-O]_n-$, $-[CH_2-CH_2-O]_n-(CH_2)_2-$, $-C(O)-[CH(R^3)]_q-$, $-(CH_2)_m-O-(CH_2)_n-$, $-(CH_2)_m-S-(CH_2)_n-$, $-(CH_2)_m-S(O)-(CH_2)_n-$, $-(CH_2)_m-S(O)_2-(CH_2)_n-$,and $-(CH_2)_m-NR_a-(CH_2)_n-$,

Y is selected from –NH-, -NR^2-, , or ;

R^1 and R^2 are each independently selected from H, -(C_1-C_{10})alkyl, –C(O)-(C_1-C_{10})alkyl, benzyl, -(C_3-C_{10})cycloalkyl, or -(C_3-C_{10})aryl;

R^a and R^b are each independently selected from the group consisting of H, -OH, -(C_1-C_{10})alkyl, -$[CH_2$-CH_2-$O]_n$-$(CH_2)_2$-T, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-Z, benzyl, -(C_3-C_{10})cycloalkyl, -(C_3-C_{10})aryl-(C_1-C_{10})alkylene, -(C_3-C_{10})aryl, halo-(C_1-C_{10})alkyl, hydroxy-(C_1-C_{10})alkyl, -NH--(C_1-C_{10})alkyl, and -(C_1-C_{10})alkylene-NR^dR^e-, or R^a and R^b together with the nitrogen to which they are bonded form a (C_3-C_6)-heteroaryl or (C_3-C_6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is selected from –OH, -O(C_1-C_{10})alkyl, , or ;

R^c is selected from -OH, -O(C_1-C_{10})alkyl, -Obenzyl, -O(C_3-C_{10})cycloalkyl, -O(C_3-C_{10})aryl, -O-(C_1-C_{10})alkylene--(C_3-C_{10})aryl, or -O-(C_1-C_{10})alkylene--(C_3-C_{10})cycloalkyl,

R^3 is selected from H, halogen, -OH, $-NH_2$, $-(CH_2)_p$-COOH, or $-(CH_2)_p$-NH_2;

T is selected from –H, –OH, -COOH, or –NR^dR^e;

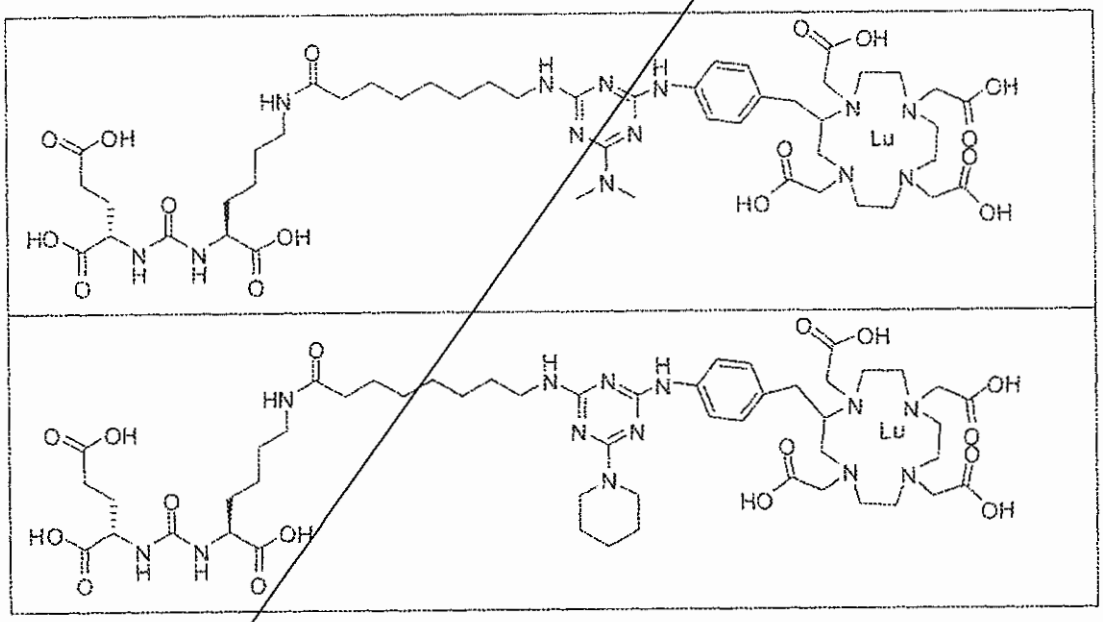
R^d and R^e are each independently selected from H, bond, -OH, -(C_1-C_{10})alkyl, or -(C_3-C_{10})heteroaryl-(C_1-C_{10})alkylene;

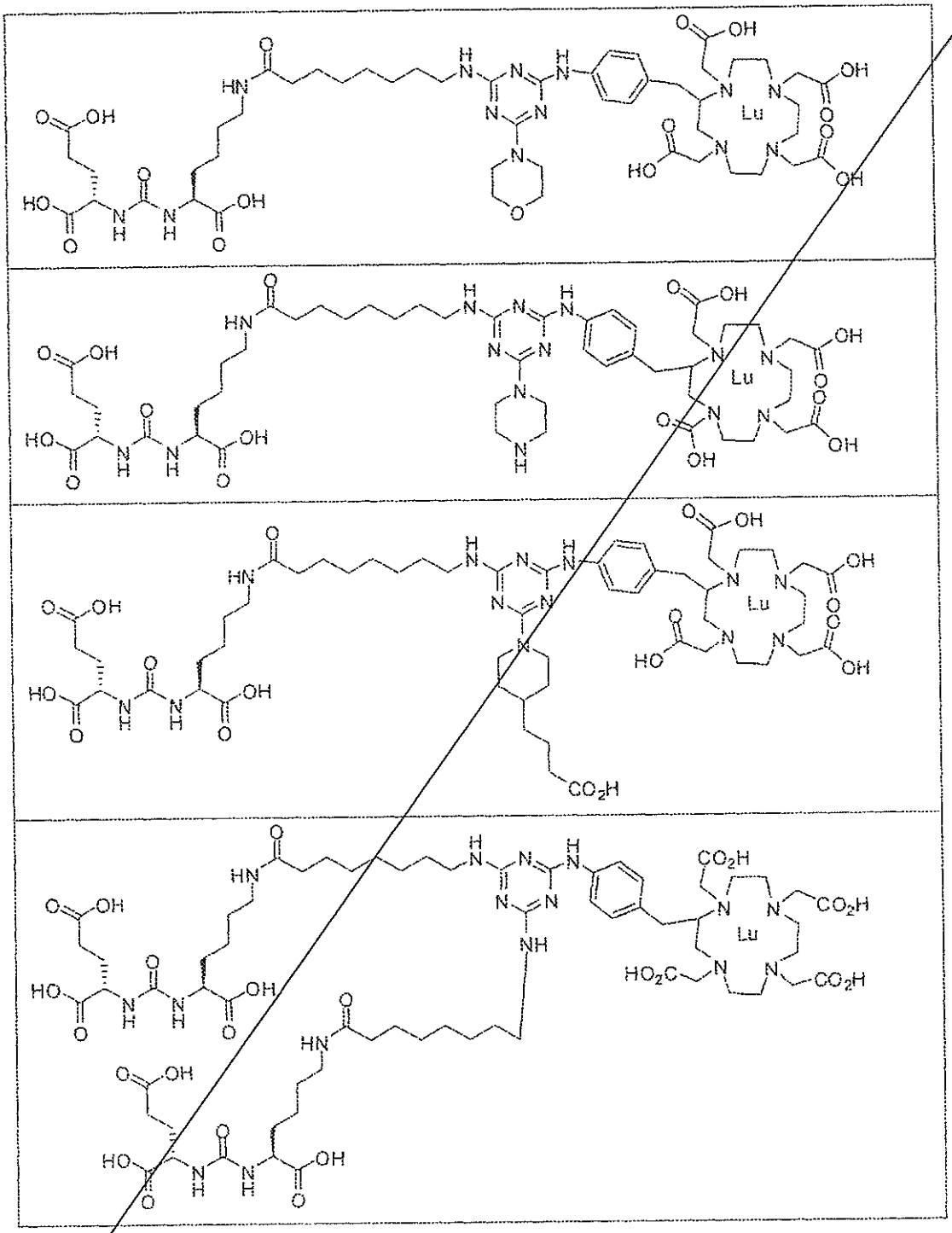
m, n, p, q, t and x are each independently 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10;

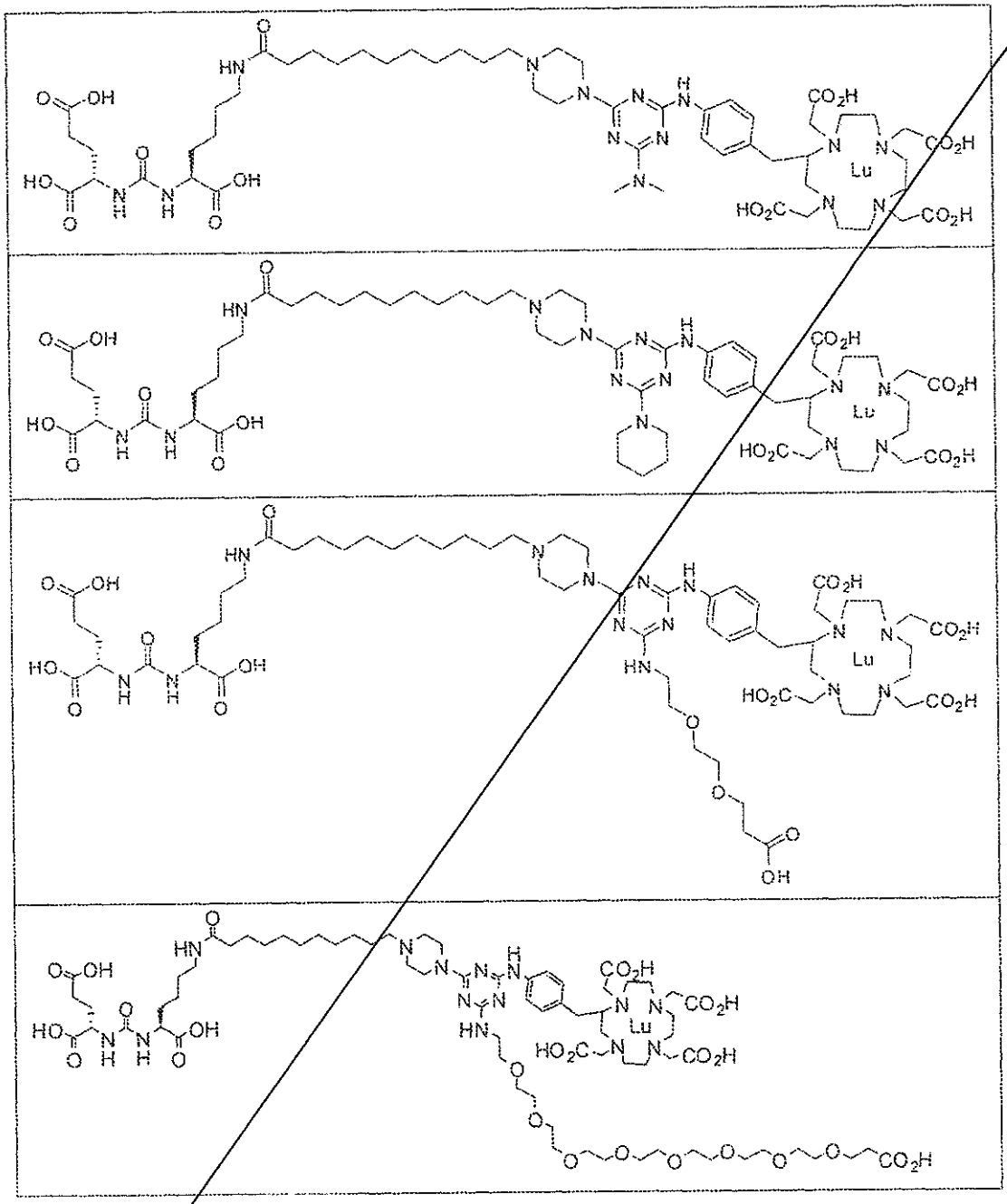
wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or 3 substituent groups selected from the group consisting of -(C_1-C_{10})alkyl, -(C_1-C_{10})haloalkyl, -(C_1-C_{10}) aminoalkyl, -(C_1-C_{10})alkylene-COOH, -(C_1-C_{10})hydroxyalkyl, -NH_2, -COOH, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-X, -NH–(C_1-C_{10})alkyl, and -(C_1-C_{10})alkylene-NR^dR^e-, and –NR^dR^e; and

the radionuclide is selected from the group consisting of ^{111}In, ^{90}Y, ^{68}Ga, ^{64}Cu ^{153}Gd, ^{155}Gd, ^{157}Gd, ^{59}Fe, ^{225}Ac, ^{212}Bi, ^{213}Bi, ^{55}Co, ^{67}Cu, ^{165}Dy, ^{166}Ho, ^{192}Ir, ^{223}Ra, ^{186}Re, ^{188}Re, ^{105}Rh, ^{212}Pb, ^{213}Pb, ^{149}Tb, ^{227}Th, ^{153}Sm, ^{89}Sr, ^{117m}Sn, ^{169}Yb, ^{90}Y, ^{86}Y, ^{89}Zr and ^{177}Lu.

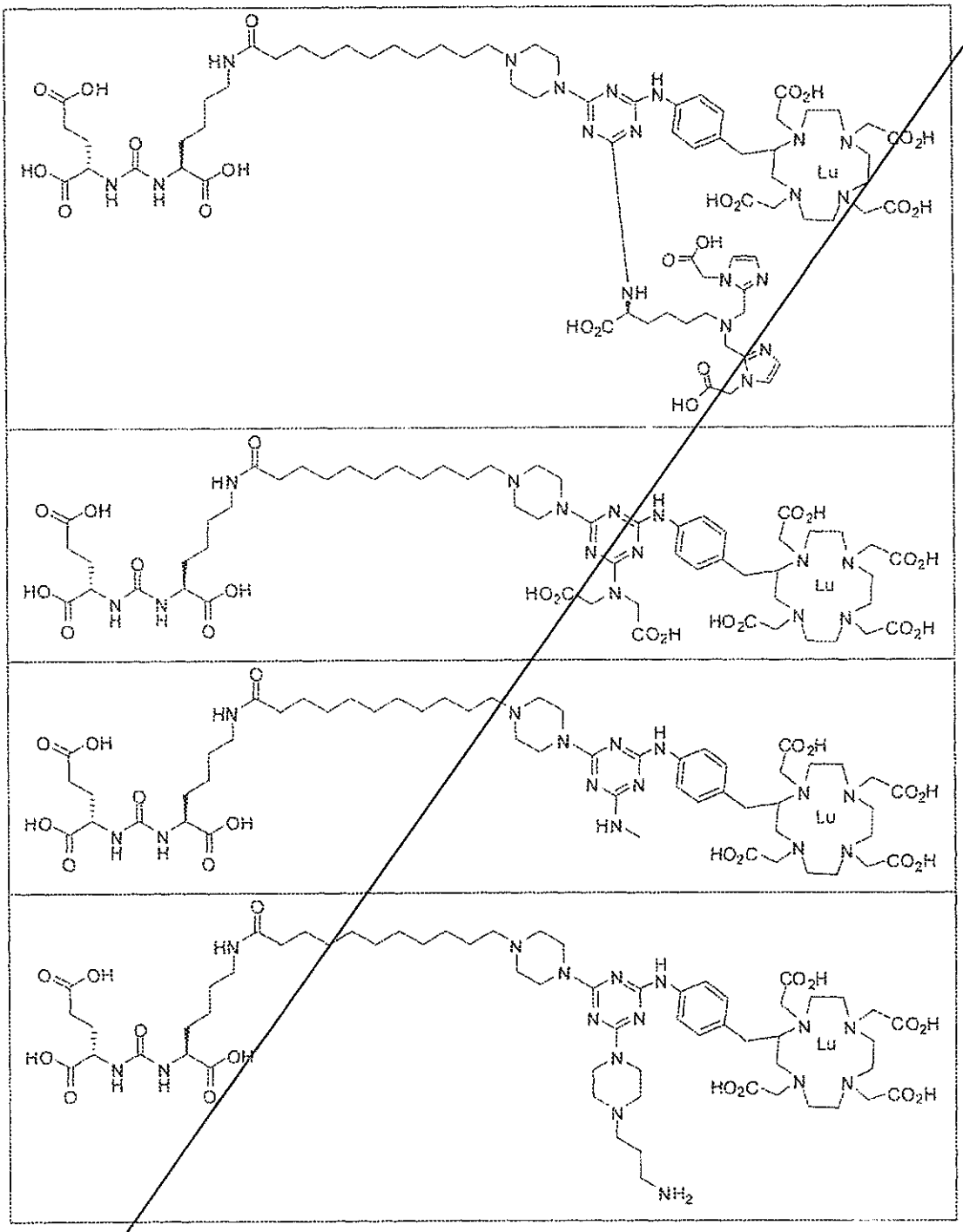
19. The metal complex of Claim 18, which is:



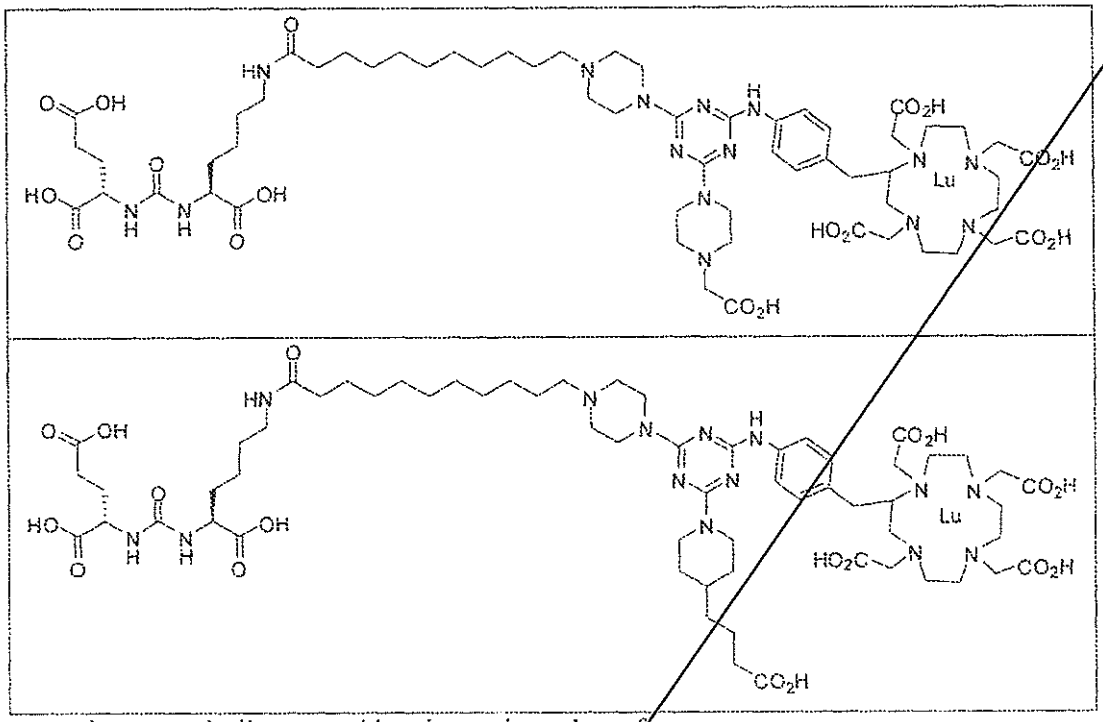

OH
HO
O
HN
H
N
Lu
CO2H
NH



5.1



5.1

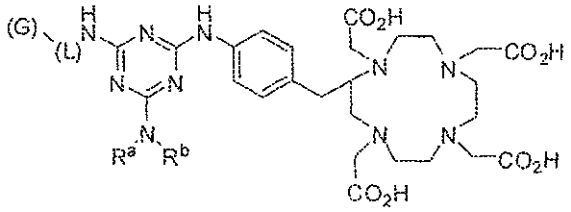


or a pharmaceutically acceptable salt or solvate thereof.

20. A pharmaceutical composition comprising the compound of Claim 3, or a pharmaceutically acceptable salt, solvate, or ester thereof; and a pharmaceutically acceptable carrier.

21. A pharmaceutical composition comprising the metal complex of Claim 18, or a pharmaceutically acceptable salt, solvate, or ester thereof; and a pharmaceutically acceptable carrier.

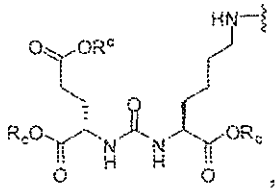
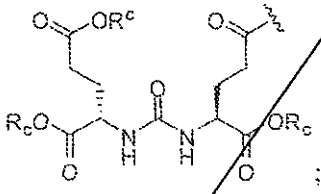
22. A method of obtaining a radiographic image of one or more tissues that express prostate-specific membrane antigen (PSMA) comprising:
contacting one or more tissues that express PSMA with a metal complex comprising a radionuclide and a compound according to Formula III,

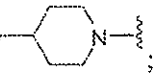


III

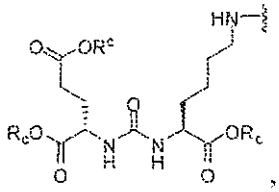
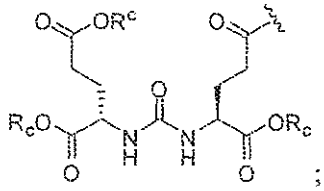
or a pharmaceutically acceptable salt or solvate thereof; and

recording a radiographic image of the one or more tissues;

wherein G is  , or  ;

L is –NH-(C_1-C_{10})alkylene-, –NH-(C_1-C_{10})alkylene-C(O)-, –C(O)-(C_1-C_{10})alkylene-, –C(O)-(C_1-C_{10})alkylene-C(O)- or -C(O)-(C_1-C_{10})alkylene;

R^a and R^b are each independently H, -OH, -(C_1-C_{10})alkyl, -[CH_2-CH_2-O]$_n$-(CH_2)$_2$-T, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-Z, benzyl, -(C_3-C_{10})cycloalkyl, -(C_3-C_{10})aryl-(C_1-C_{10})alkylene, -(C_3-C_{10})aryl, halo-(C_1-C_{10})alkyl, hydroxy-(C_1-C_{10})alkyl, -NH-(C_1-C_{10})alkyl, or -(C_1-C_{10})alkylene-NR^dR^e-, or R^a and R^b together with the nitrogen to which they are bonded form a (C_3-C_6)-heteroaryl or (C_3-C_6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is –OH, -O(C_1-C_{10})alkyl,  , or  ;

R^d and R^e are each independently H, bond, -OH, -(C_1-C_{10})alkyl, or -(C_3-C_{10})heteroaryl-(C_1-C_{10})alkylene;

n is 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10; and

wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally

substituted with 1, 2, or 3 substituent groups selected from -(C_1-C_{10})alkyl, -(C_1-C_{10})haloalkyl, -(C_1-C_{10}) aminoalkyl, -(C_1-C_{10})alkylene-COOH, -(C_1-C_{10})hydroxyalkyl, -NH_2, -COOH, –C(O)-(C_1-C_{10})alkyl, –(C_1-C_{10})alkylene-C(O)-, –(C_1-C_{10})alkylene-C(O)-X, -NH–(C_1-C_{10})alkyl, or -(C_1-C_{10})alkylene-NR^dR^e-, and –NR^dR^e.

23. The method of claim 22 in which the one or more tissues are selected from prostate tissue or prostate cancer tissue.

24. The method of claim 22, wherein the radionuclide is selected from the group consisting of ^{111}In, ^{90}Y, ^{68}Ga, ^{64}Cu ^{153}Gd, ^{155}Gd, ^{157}Gd, ^{59}Fe, ^{225}Ac, ^{212}Bi, ^{213}Bi, ^{55}Co, ^{67}Cu, ^{165}Dy, ^{166}Ho, ^{192}Ir, ^{223}Ra, ^{186}Re, ^{188}Re, ^{105}Rh, ^{212}Pb, ^{213}Pb, ^{149}Tb, ^{227}Th, ^{153}Sm, ^{89}Sr, ^{117m}Sn, ^{169}Yb, ^{90}Y, ^{86}Y, ^{89}Zr and ^{177}Lu.

25. A method for treating a subject diagnosed with cancer, comprising administering to a subject a therapeutically effective amount of a prostate-specific membrane antigen (PSMA) binding complex comprising a triazinylene linker, wherein the complex is retained in a PSMA-expressing tumor tissue for a longer interval of time than non-PSMA expressing tissue.

26. The method of Claim 25, wherein the complex is retained in PSMA-expressing tumor tissue for a longer interval of time than non-PSMA expressing tissue selected from kidney, liver, spleen, heart, blood, lungs, muscle, bone, large intestine, small intestine, brain , or fat.

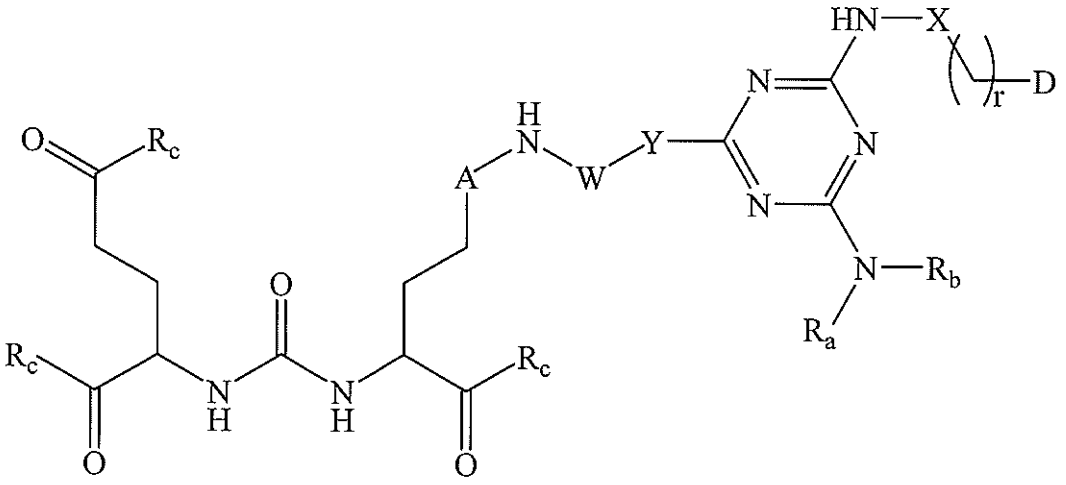
27. The method of Claim 25, wherein the complex is retained in PSMA-expressing tumor tissue for a longer interval of time than kidney.

28. The method of Claim 25, wherein the cancer is selected from prostate cancer, breast cancer, colorectal cancer, brain cancer, lung cancer, liver cancer, endometrial cancer, bone cancer, ovarian cancer, testicular cancer, skin cancer, pancreatic cancer, uterine cancer, cervical cancer, bladder cancer, esophageal cancer, gastric cancer, head and neck cancers, or kidney cancer.

29. The method of Claim 28, wherein the cancer is prostate cancer.

CLAIMS:

1. A compound according to formula I

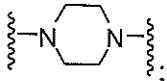


I

wherein:

A is (CHR1)m or C(O);

W is–C(O)–(CH2)p-; -C(O)[-CH2-CH2-O]n-, -[CH2-CH2-O]n-(CH2)2-, –C(O)-[CH(R3)t]q-, -(CH2)m-O-(CH2)n-, -(CH2)m-S-(CH2)n-, -(CH2)m-S(O)-(CH2)n-, -(CH2)m-S(O)2-(CH2)n-, or -(CH2)m-NRa-(CH2)n-,

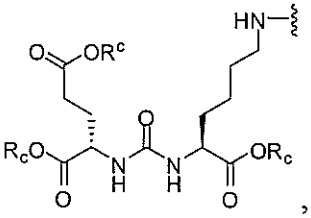
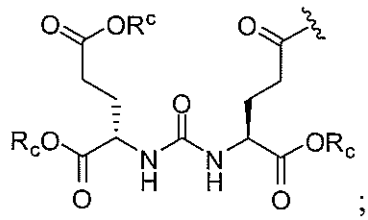
Y is–NH-, -NR2-, or ;

X is –(C1-C10)alkylene-(C3-C10)arylene, -(C3-C10)arylene, -(C3-C10)arylene–(C1-C10)alkylene-, phenylene, –(C1-C10)alkylene-(C3-C10)cycloalkylene, -(C3-C10)cycloalkylene, or -(C3-C10)cycloalkylene–(C1-C10)alkylene-;

R1 and R2 are each independently H, -(C1-C10)alkyl, –C(O)-(C1-C10)alkyl, benzyl, -(C3-C10)cycloalkyl, or -(C3-C10)aryl;

Ra and Rb are each independently H, -OH, -(C1-C10)alkyl, -[CH2-CH2-O]n-(CH2)2-T, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-Z, benzyl, -(C3-C10)cycloalkyl, -(C3-C10)aryl-(C1-C10)alkylene, -(C3-C10)aryl, halo-(C1-C10)alkyl, hydroxy-(C1-C10)alkyl, -NH--(C1-C10)alkyl, or -(C1-C10)alkylene-NRdRe-, or Ra and Rb

together with the nitrogen to which they are bonded form a (C3-C6)-heteroaryl or (C3-C6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is–OH, -O(C1-C10)alkyl,  , or  ;

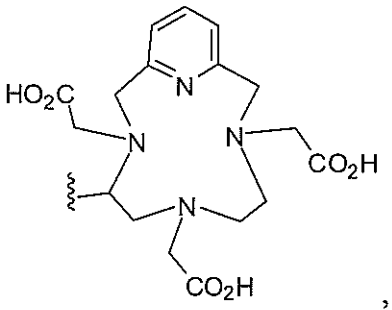
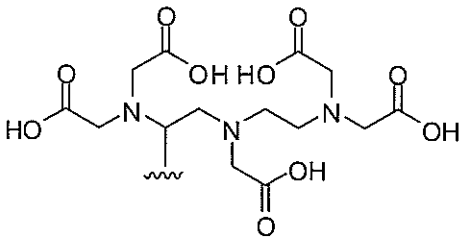
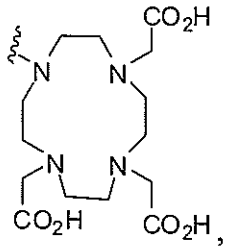
Rc is -OH, -O(C1-C10)alkyl, -Obenzyl, -O(C3-C10)cycloalkyl, -O(C3-C10)aryl, -O-(C1-C10)alkylene-(C3-C10)aryl, or -O-(C1-C10)alkylene--(C3-C10)cycloalkyl,

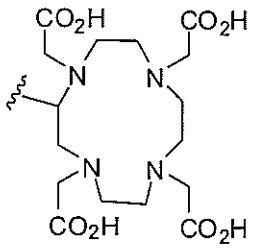
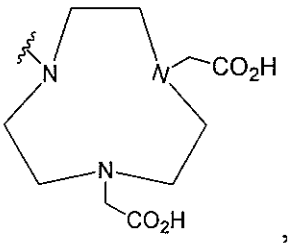
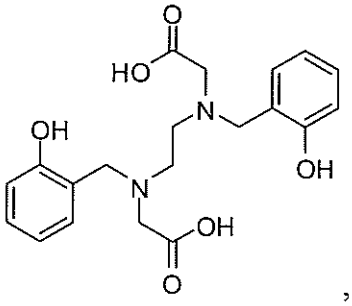
R3 is H, halogen, -OH, -NH2, –(CH2)p-COOH, or –(CH2)p- NH2;

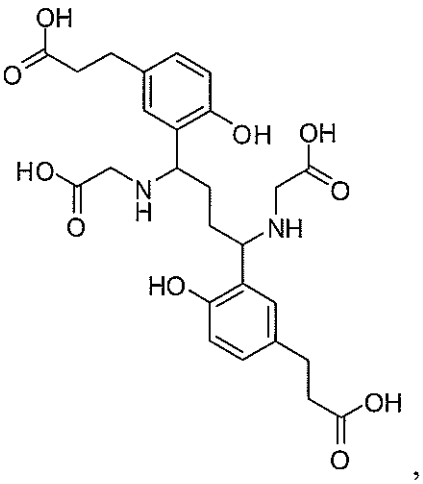
T is–H, –OH, -COOH, or –NRdRe;

Rd and Re are each independently H, bond, -OH, -(C1-C10)alkyl, or -(C3-C10)heteroaryl-(C1-C10)alkylene;

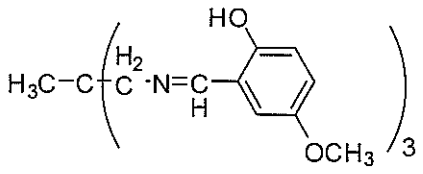
m, n, p, q, t and r are each independently 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10; and

D is  ,  ,  ,

 ,  ,  ,

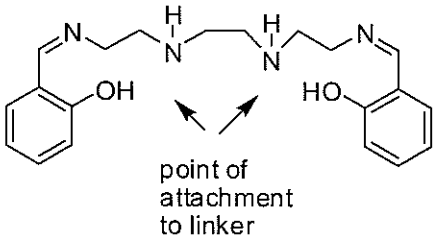


,



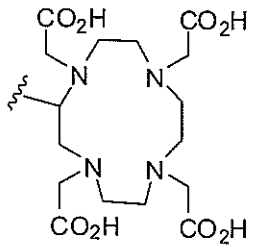
H_3 [5-MeOsal)$_3$ TAME]

, or

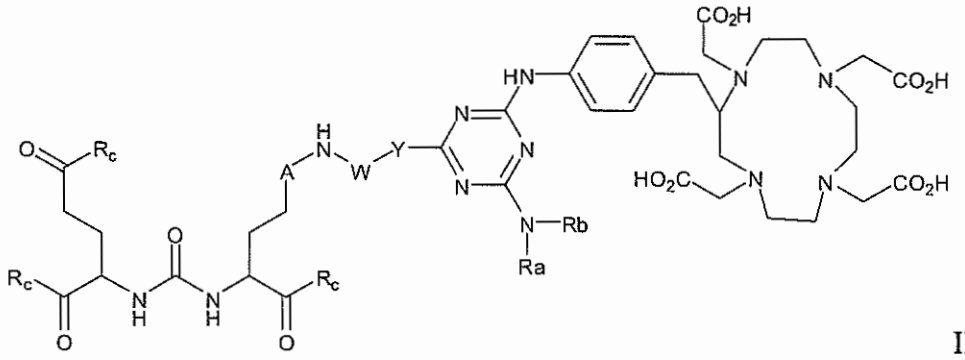


;

wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or 3 substituent groups selected from the group consisting of -(C1-C10)alkyl, -(C1-C10)haloalkyl, -(C1-C10) aminoalkyl, -(C1-C10)alkylene-COOH, -(C1-C10)hydroxyalkyl, -OH, halogen, -NH2, -COOH, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-X, -NH--(C1-C10)alkyl, and -(C1-C10)alkylene-NRdRe-, and –NRdRe.

2. The compound of Claim 1, wherein X is phenylene, r is 1 and D is .

3. The compound of Claim 2, wherein the compound is a compound according to Formula II

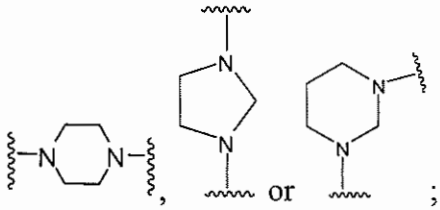


II

wherein:

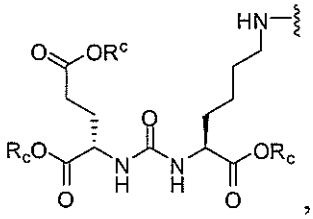
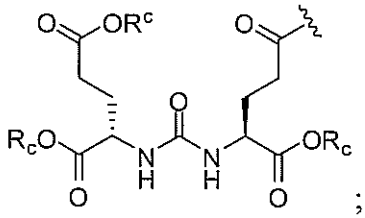
A is (CHR1)m or C(O);

W is selected from the group consisting of –C(O)–(CH2)p-; -C(O)[-CH2-CH2-O]n-, -[CH2-CH2-O]n-(CH2)2-, –C(O)-[CH(R3)t]q-, -(CH2)m-O-(CH2)n-, -(CH2)m-S-(CH2)n-, -(CH2)m-S(O)-(CH2)n-, -(CH2)m-S(O)2-(CH2)n-,and -(CH2)m-NRa-(CH2)n-,

Y is selected from –NH-, -NR2-, ;

R1 and R2 are each independently selected from H, -(C1-C10)alkyl, –C(O)-(C1-C10)alkyl, benzyl, -(C3-C10)cycloalkyl, or -(C3-C10)aryl;

Ra and Rb are each independently selected from the group consisting of H, -OH, -(C1-C10)alkyl, -[CH2-CH2-O]n-(CH2)2-T, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-Z, benzyl, -(C3-C10)cycloalkyl, -(C3-C10)aryl-(C1-C10)alkylene, -(C3-C10)aryl, halo-(C1-C10)alkyl, hydroxy-(C1-C10)alkyl, -NH--(C1-C10)alkyl, and -(C1-C10)alkylene-NRdRe-, or Ra and Rb together with the nitrogen to which they are bonded form a (C3-C6)-heteroaryl or (C3-C6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is selected from –OH, -O(C1-C10)alkyl, , or ;

Rc is selected from -OH, -O(C1-C10)alkyl, -Obenzyl, -O(C3-C10)cycloalkyl, -O(C3-C10)aryl, -O-(C1-C10)alkylene--(C3-C10)aryl, or -O-(C1-C10)alkylene--(C3-C10)cycloalkyl,

R3 is selected from H, halogen, -OH, -NH2, –(CH2)p-COOH, or –(CH2)p- NH2;

T is selected from –H, –OH, -COOH, or –NRdRe;

Rd and Re are each independently selected from H, bond, -OH, -(C1-C10)alkyl, or -(C3-C10)heteroaryl-(C1-C10)alkylene;

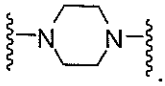
m, n, p, q, t and x are each independently 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10;

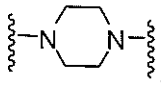
wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or 3 substituent groups selected from the group consisting of -(C1-C10)alkyl, -(C1-C10)haloalkyl, -(C1-C10) aminoalkyl, -(C1-C10)alkylene-COOH, -(C1-C10)hydroxyalkyl, -NH2, -COOH, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-X, -NH--(C1-C10)alkyl, and -(C1-C10)alkylene-NRdRe-, and –NRdRe.

4. The compound of Claim 3, wherein A is (CHR1)m and W is –C(O)–(CH2)p-.

5. The compound of Claim 4, wherein W is -C(O)-(CH2)7- or -C(O)-(CH2)10-.

6. The compound of Claim 4, wherein R1 is hydrogen and m is 2.

7. The compound of Claim 3, wherein Y is –NH- or .

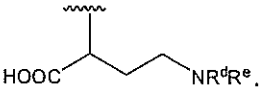
8. The compound of Claim 7, wherein Y is .

9. The compound of Claim 3, wherein Ra and Rb are each independently hydrogen or methyl and Rc is -OH.

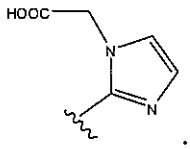
10. The compound of Claim 3, wherein Ra and Rb together with the nitrogen to which they are bonded form a (C3-C6)-heterocycloalkyl.

11. The compound of Claim 10, wherein the (C3-C6)-heterocycloalkyl is selected from piperidine, piperazine, morpholine, thiomorpholine, isothiazolidine, isoxazolidine, pyrrolidine, immidazolidine, thiazolidine or oxazolidine.

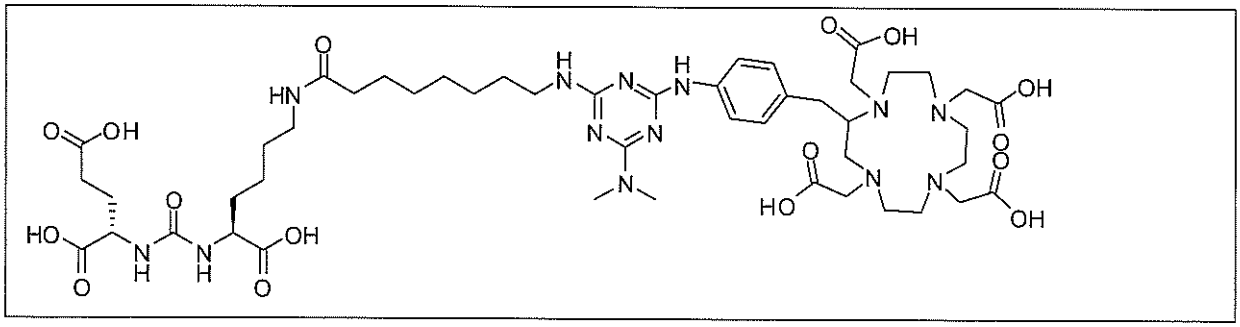
12. The compound of Claim 11, wherein the (C3-C6)-heterocycloalkyl is piperidine or 4-(piperidin-4-yl)butanoic acid.

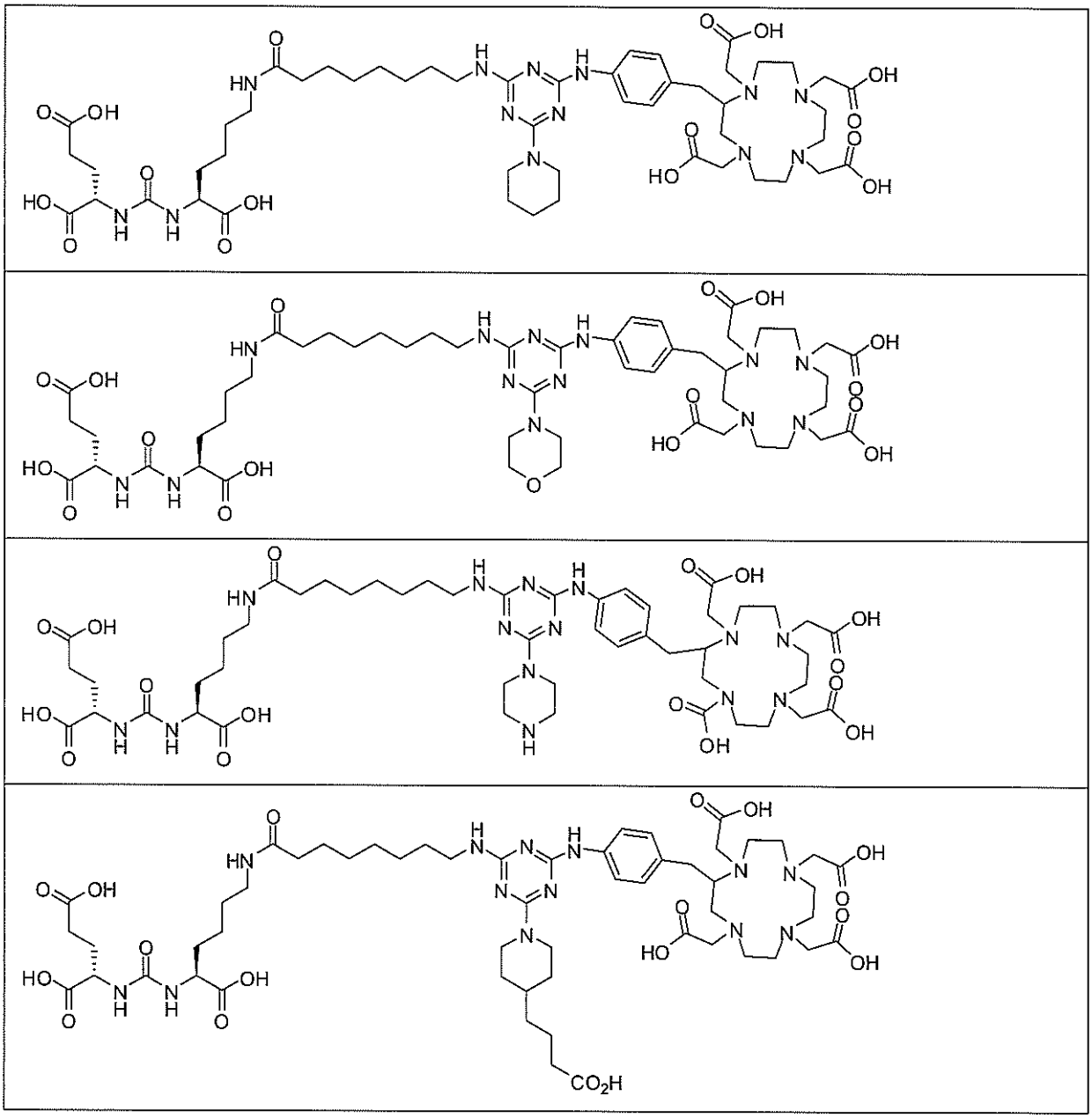
13. The compound of Claim 10, wherein Ra is -H and Rb is .

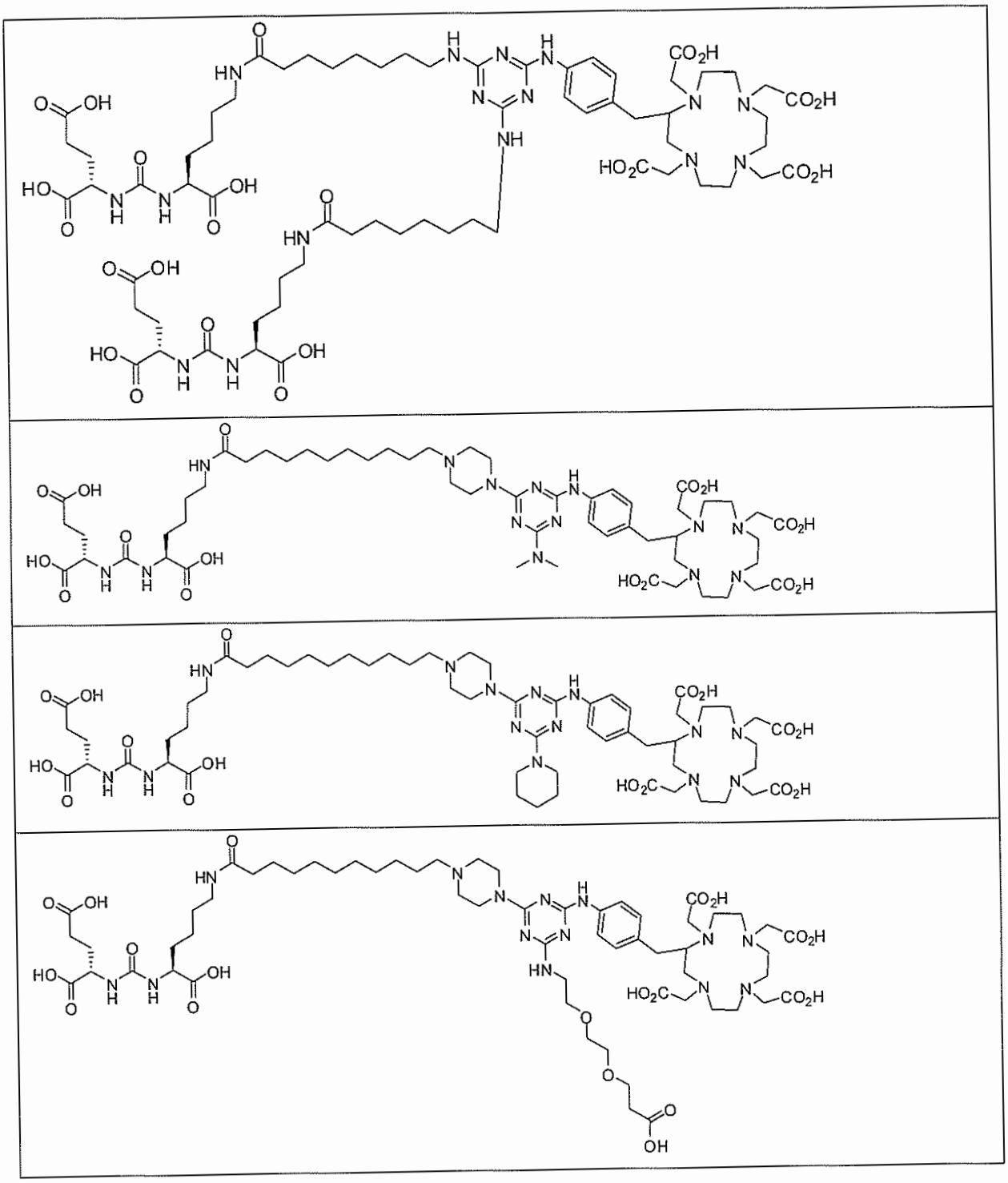
14. The compound according to claim 10, wherein Rd and Re are each independently -(C3-C10)heteroaryl-(C1-C10)alkylene.

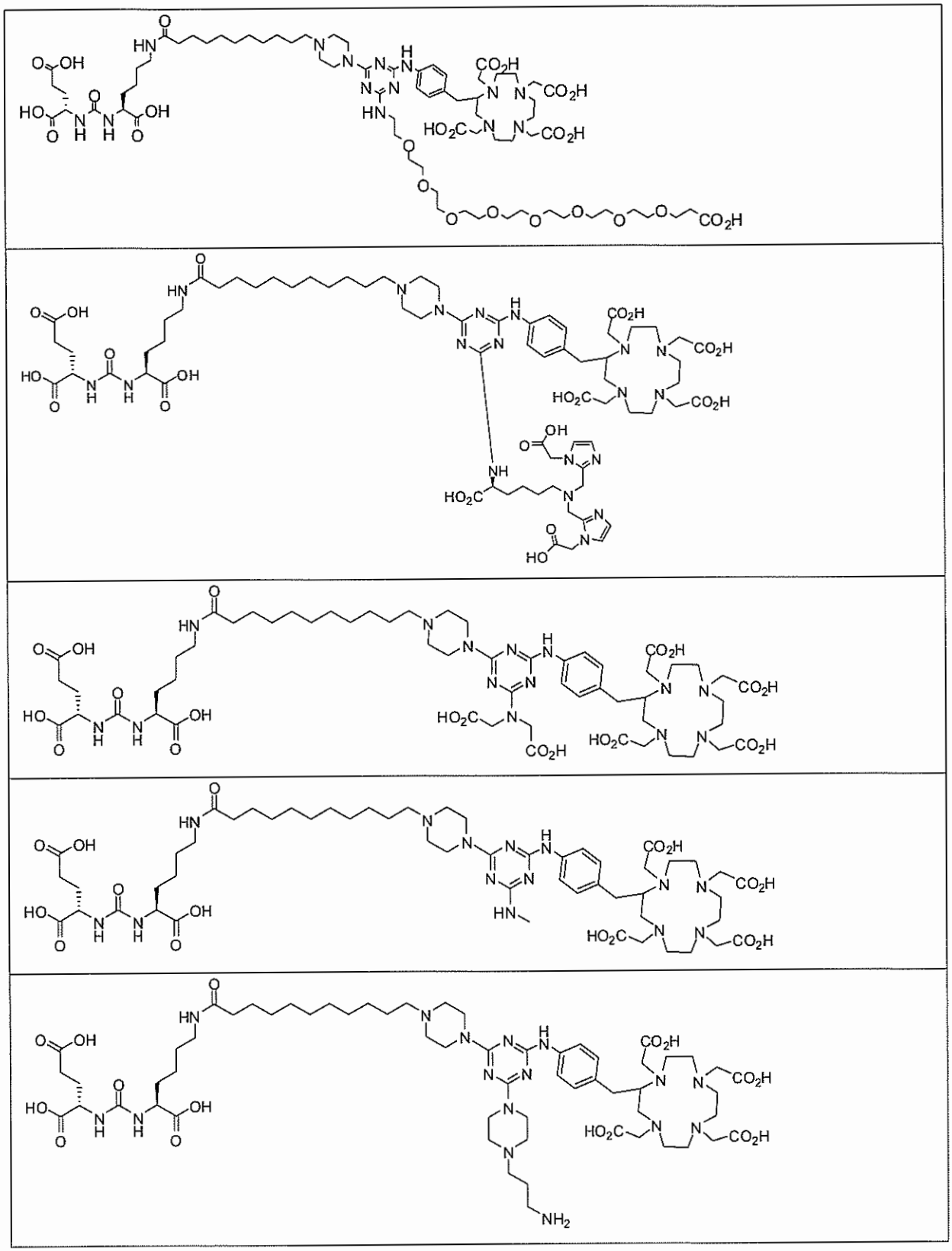
15. The compound of Claim 10, wherein Rd and Re are each independently .

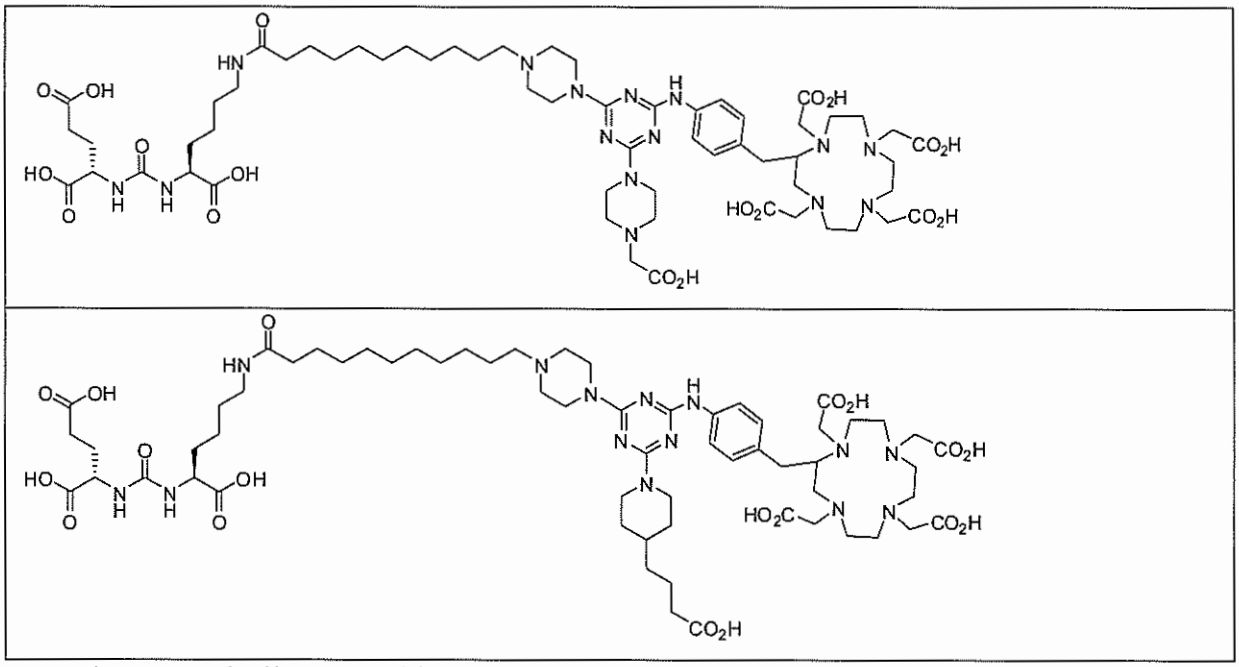
16. The compound of Claim 3, which is selected from the following compounds:







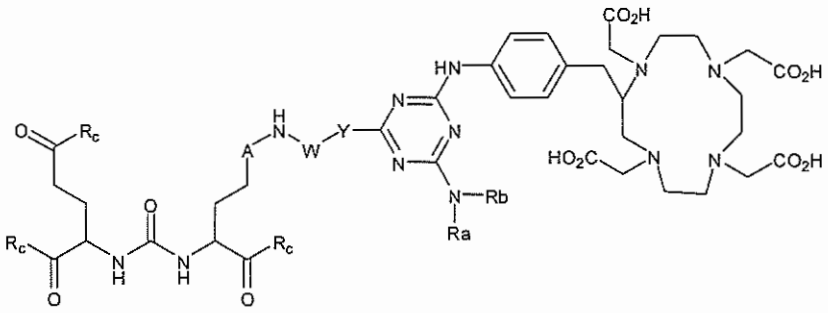




or a pharmaceutically acceptable salt, solvate, or ester thereof.

17. A metal complex comprising a radionuclide and a compound of Claim 1.

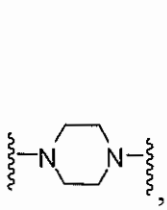
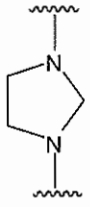
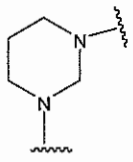
18. The metal complex of Claim 17, wherein the compound is



wherein:

A is (CHR1)m or C(O);

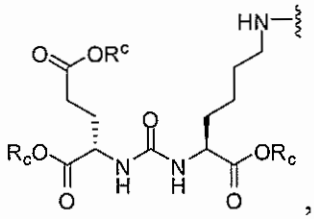
W is selected from the group consisting of –C(O)–(CH2)p-; -C(O)[-CH2-CH2-O]n-, -[CH2-CH2-O]n-(CH2)2-, –C(O)-[CH(R3)t]q-, -(CH2)m-O-(CH2)n-, -(CH2)m-S-(CH2)n-, -(CH2)m-S(O)-(CH2)n-, -(CH2)m-S(O)2-(CH2)n-,and -(CH2)m-NRa-(CH2)n-,

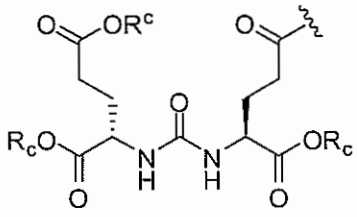
Y is selected from –NH-, -NR2-, ,  or  ;

R1 and R2 are each independently selected from H, -(C1-C10)alkyl, –C(O)-(C1-C10)alkyl, benzyl, -(C3-C10)cycloalkyl, or -(C3-C10)aryl;

Ra and Rb are each independently selected from the group consisting of H, -OH, -(C1-C10)alkyl, -[CH2-CH2-O]n-(CH2)2-T, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-Z, benzyl, -(C3-C10)cycloalkyl, -(C3-C10)aryl-(C1-C10)alkylene, -(C3-C10)aryl, halo-(C1-C10)alkyl, hydroxy-(C1-C10)alkyl,

-NH--(C1-C10)alkyl, and -(C1-C10)alkylene-NRdRe-, or Ra and Rb together with the nitrogen to which they are bonded form a (C3-C6)-heteroaryl or (C3-C6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is selected from –OH, -O(C1-C10)alkyl, , or

;

Rc is selected from -OH, -O(C1-C10)alkyl, -Obenzyl, -O(C3-C10)cycloalkyl, -O(C3-C10)aryl, -O-(C1-C10)alkylene--(C3-C10)aryl, or -O-(C1-C10)alkylene--(C3-C10)cycloalkyl,

R3 is selected from H, halogen, -OH, -NH2, –(CH2)p-COOH, or –(CH2)p- NH2;

T is selected from –H, –OH, -COOH, or –NRdRe;

Rd and Re are each independently selected from H, bond, -OH, -(C1-C10)alkyl, or -(C3-C10)heteroaryl-(C1-C10)alkylene;

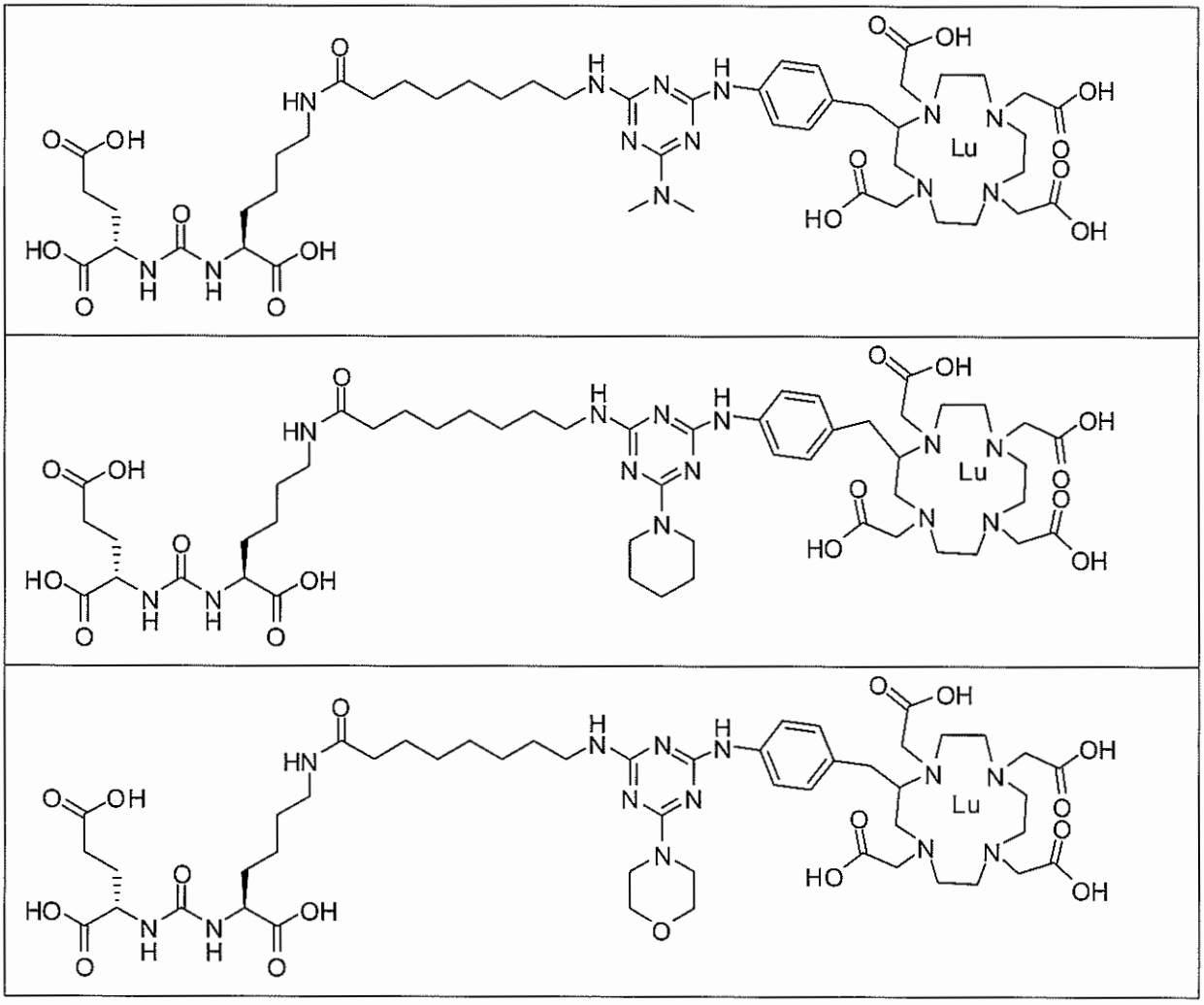
m, n, p, q, t and x are each independently 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10;

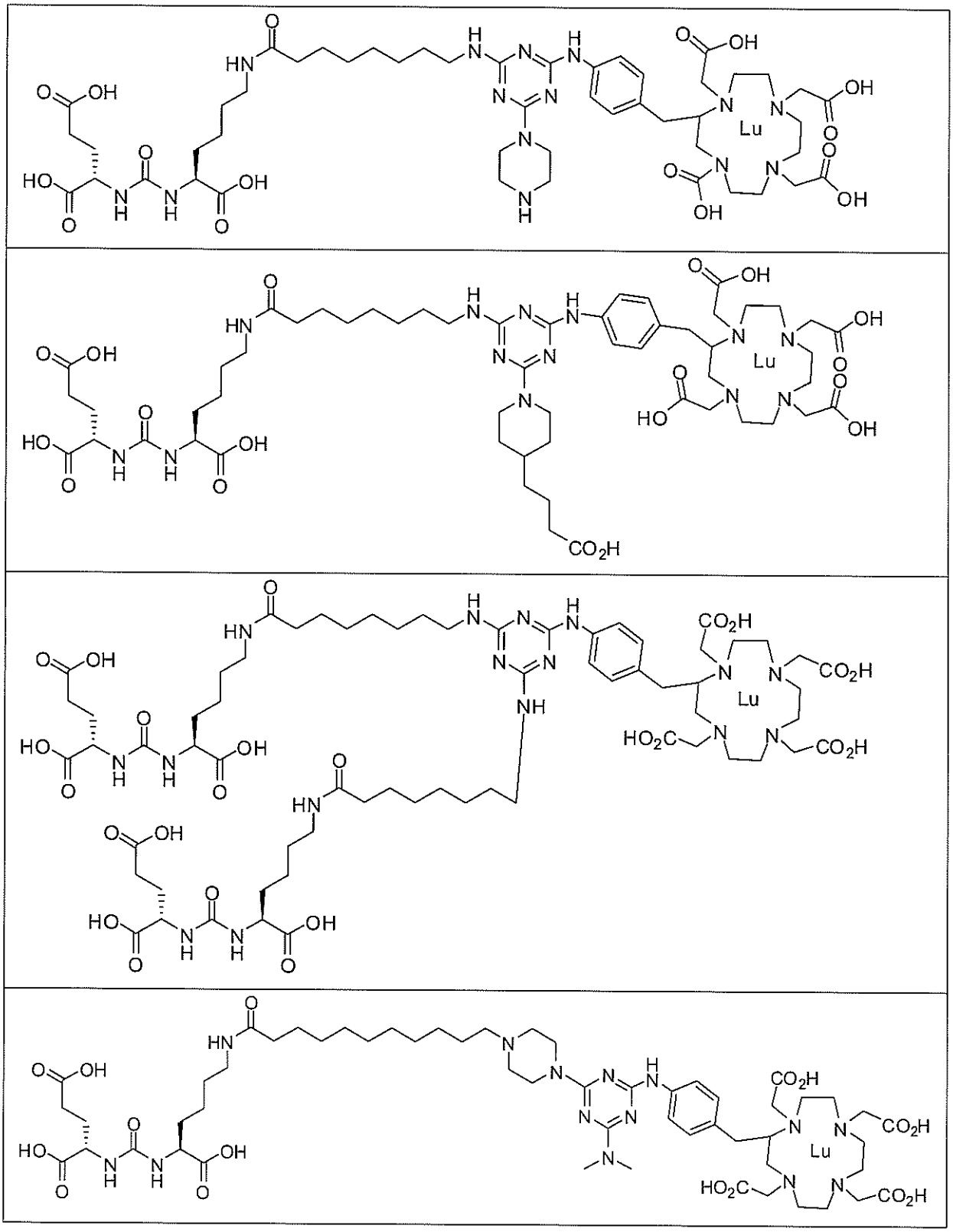
wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or

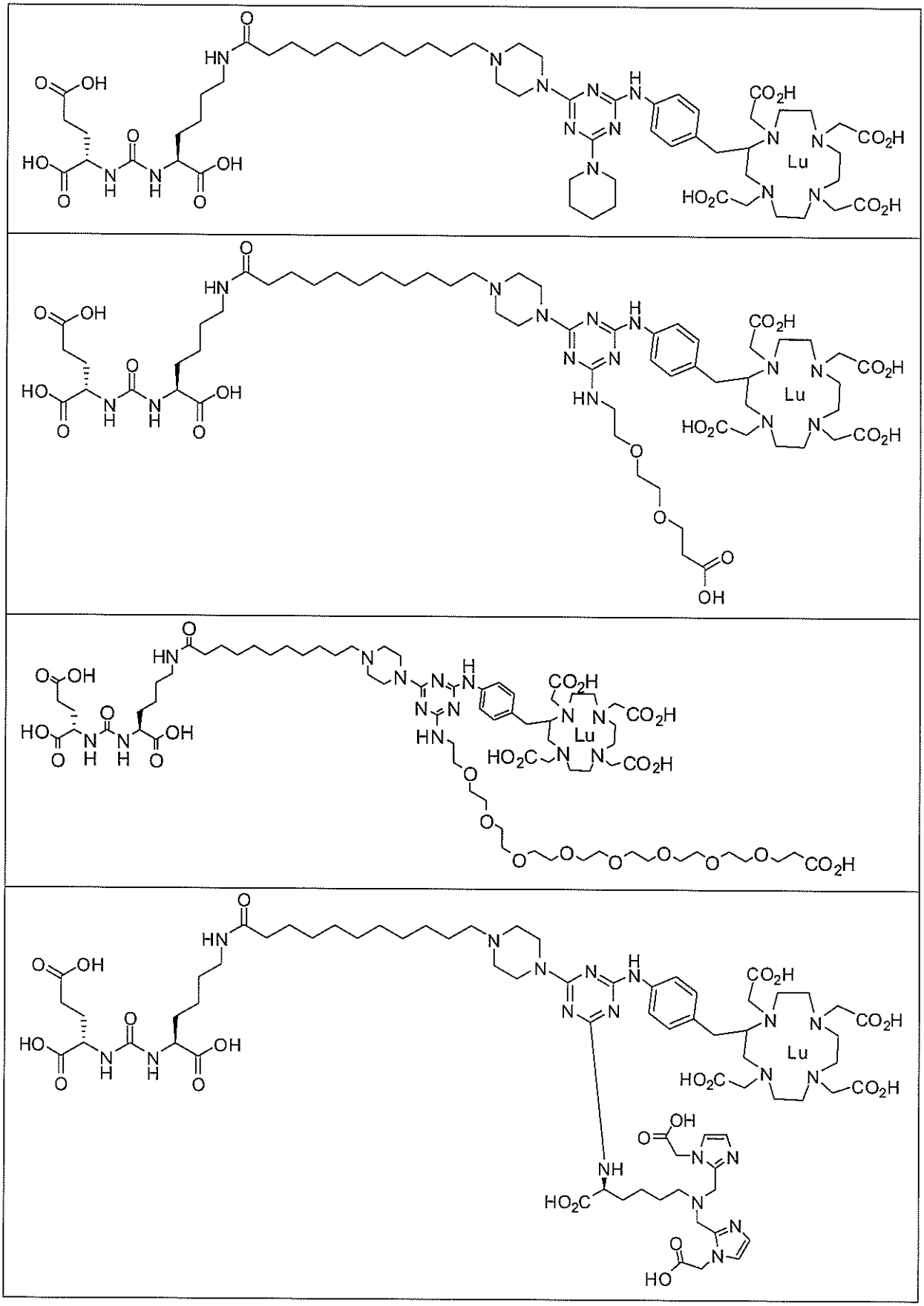
3 substituent groups selected from the group consisting of -(C1-C10)alkyl, -(C1-C10)haloalkyl, -(C1-C10) aminoalkyl, -(C1-C10)alkylene-COOH, -(C1-C10)hydroxyalkyl, -NH2, -COOH, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-X, -NH--(C1-C10)alkyl, and -(C1-C10)alkylene-NRdRe-, and –NRdRe; and

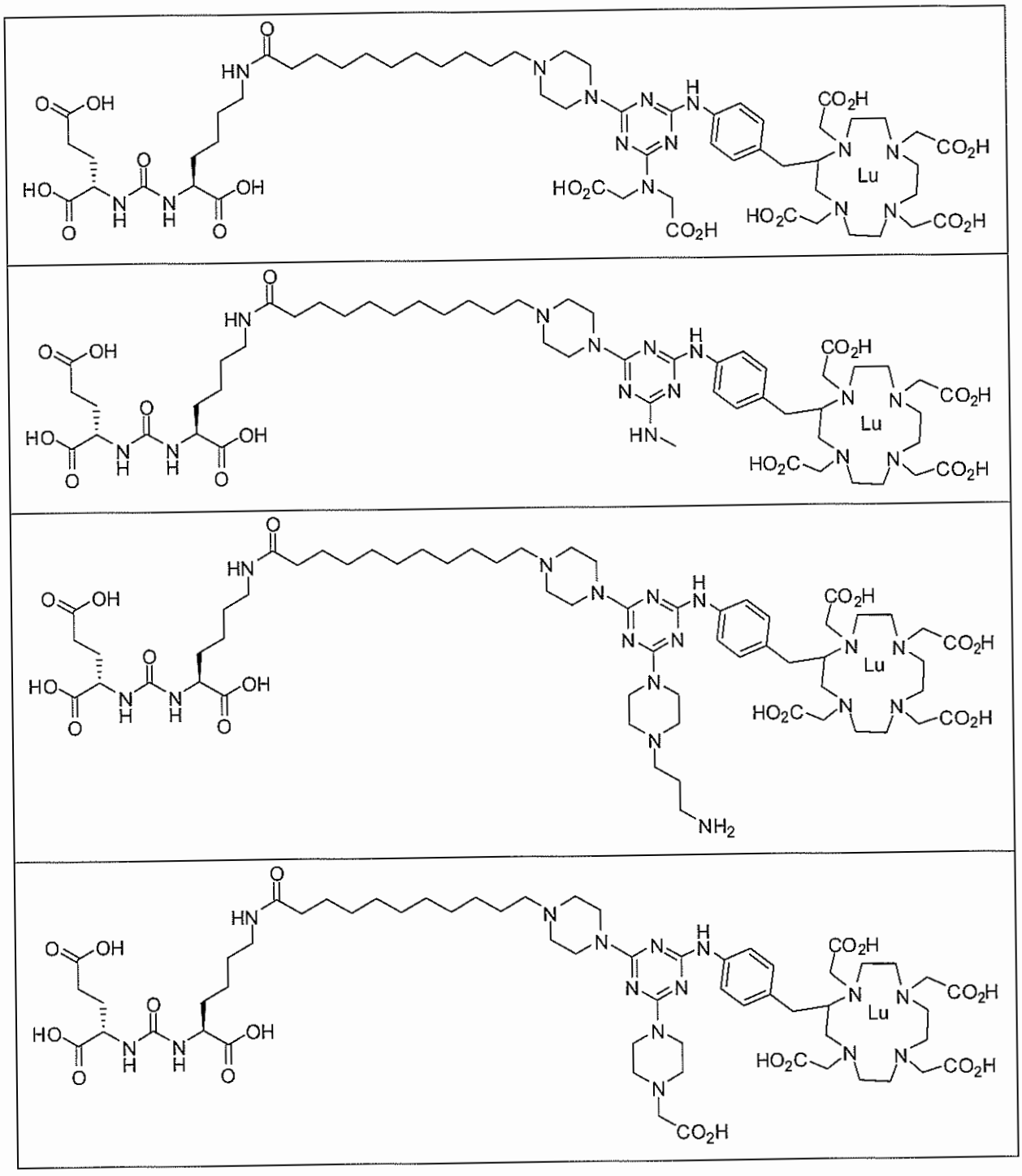
the radionuclide is selected from the group consisting of 111In, 90Y,68 Ga, 64Cu 153Gd, 155Gd, 157Gd, 59Fe, 225Ac, 212Bi, 213Bi, 55Co, 67Cu, 165Dy, 166Ho, 192Ir, 223Ra, 186Re, 188Re, 105Rh, 212Pb, 213Pb, 149Tb, 227Th, 153Sm, 89Sr, 117mSn, 169Yb, 90Y, 86Y, 89Zr and 177Lu.

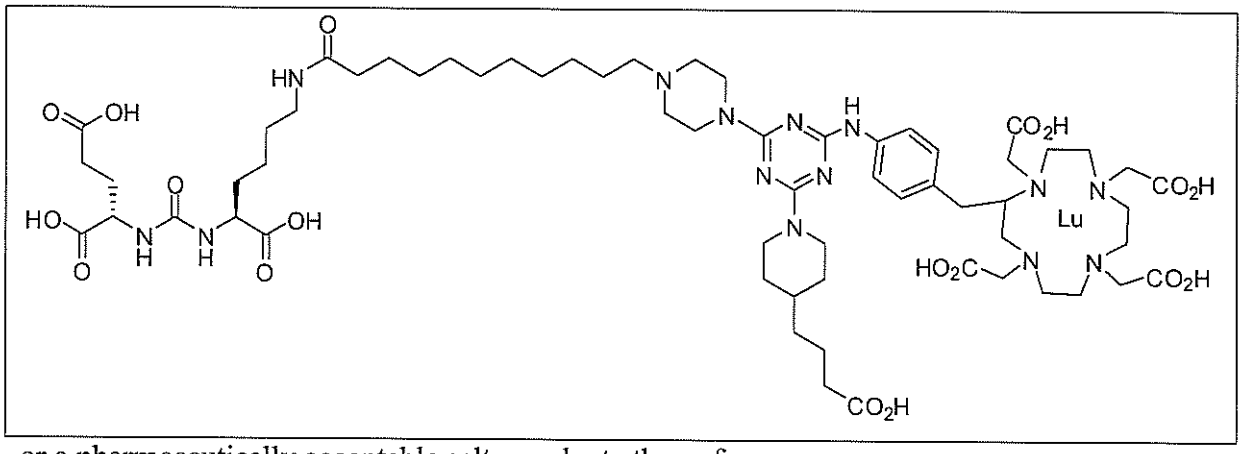
19. The metal complex of Claim 18, which is:









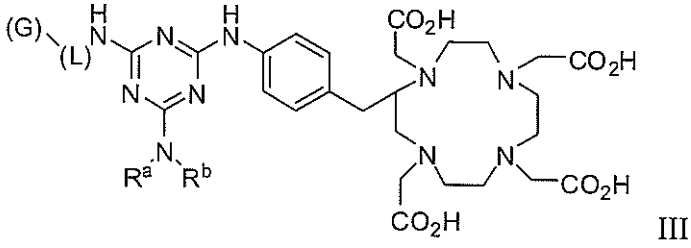


or a pharmaceutically acceptable salt or solvate thereof.

20. A pharmaceutical composition comprising the compound of Claim 3, or a pharmaceutically acceptable salt, solvate, or ester thereof; and a pharmaceutically acceptable carrier.

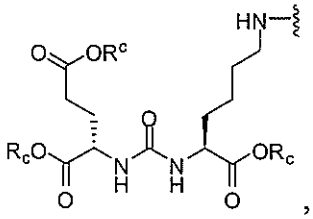
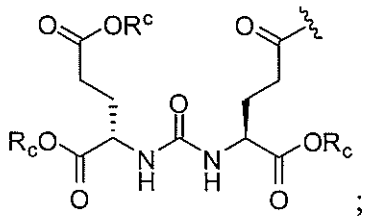
21. A pharmaceutical composition comprising the metal complex of Claim 18, or a pharmaceutically acceptable salt, solvate, or ester thereof; and a pharmaceutically acceptable carrier.

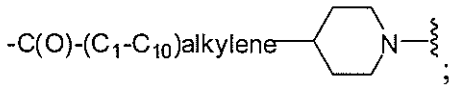
22. A method of obtaining a radiographic image of one or more tissues that express prostate-specific membrane antigen (PSMA) comprising:
contacting one or more tissues that express PSMA with a metal complex comprising a radionuclide and a compound according to Formula III,



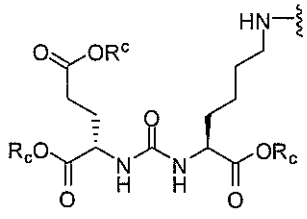
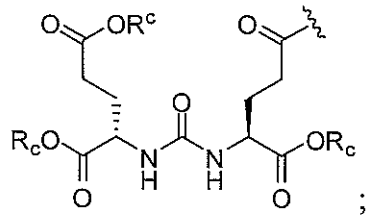
III

or a pharmaceutically acceptable salt or solvate thereof; and
recording a radiographic image of the one or more tissues;

wherein G is  , or  ;

L is–NH-(C1-C10)alkylene-, –NH-(C1-C10)alkylene-C(O)-, –C(O)-(C1-C10)alkylene-, –C(O)-(C1-C10)alkylene-C(O)- or ;

Ra and Rb are each independently H, -OH, -(C1-C10)alkyl, -[CH2-CH2-O]n-(CH2)2-T, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-Z, benzyl, -(C3-C10)cycloalkyl, -(C3-C10)aryl-(C1-C10)alkylene, -(C3-C10)aryl, halo-(C1-C10)alkyl, hydroxy-(C1-C10)alkyl, -NH--(C1-C10)alkyl, or -(C1-C10)alkylene-NRdRe-, or Ra and Rb together with the nitrogen to which they are bonded form a (C3-C6)-heteroaryl or (C3-C6)-heterocycloalkyl that can further comprise one or more heteroatoms selected from N, S, or O;

Z is–OH, -O(C1-C10)alkyl,  , or  ;

Rd and Re are each independently H, bond, -OH, -(C1-C10)alkyl, or -(C3-C10)heteroaryl-(C1-C10)alkylene;

n is 0, 1, 2, 3, 4, 5, 6, 7, 8 9, or 10; and

wherein any alkyl, alkylene, aryl, arylene, heteroaryl, heteroarylene, cycloalkyl, cycloalkylene, heterocycloalkyl, or heterocycloalkylene is optionally substituted with 1, 2, or 3 substituent groups selected from -(C1-C10)alkyl, -(C1-C10)haloalkyl, -(C1-C10) aminoalkyl, -(C1-C10)alkylene-COOH, -(C1-C10)hydroxyalkyl, -NH2, -COOH, –C(O)-(C1-C10)alkyl, –(C1-C10)alkylene-C(O)-, –(C1-C10)alkylene-C(O)-X, -NH--(C1-C10)alkyl, or -(C1-C10)alkylene-NRdRe-, and –NRdRe.

23. The method of claim 22 in which the one or more tissues are selected from prostate tissue or prostate cancer tissue.

24. The method of claim 22, wherein the radionuclide is selected from the group consisting of111In, 90Y,68 Ga, 64Cu 153Gd, 155Gd, 157Gd, 59Fe, 225Ac, 212Bi, 213Bi, 55Co, 67Cu, 165Dy, 166Ho, 192Ir, 223Ra, 186Re, 188Re, 105Rh, 212Pb, 213Pb, 149Tb, 227Th, 153Sm, 89Sr, 117mSn, 169Yb, 90Y, 86Y, 89Zr and 177Lu.

25. A prostate-specific membrane antigen (PSMA) binding complex for use in therapy.

26. The binding complex as claimed in claim 25 wherein the complex is that claimed in claim 17, 18 or 19.

27. Use of a therapeutically effective amount of a prostate-specific membrane antigen (PSMA) binding complex, comprising a triazinylene linker in the manufacture of a medicament for the treatment of a subject diagnosed with cancer, wherein the complex is retained in a PSMA-expressing tumor tissue for a longer interval of time than non-PSMA expressing tissue.

28. Use as claimed in claim 27, wherein the binding complex is that claimed in claim 17, 18 or 19.

29. The complex or use as claimed in any one of claims 25-28, wherein the complex is retained in PSMA-expressing tumor tissue for a longer interval of time than non-PSMA expressing tissue selected from kidney, liver, spleen, heart, blood, lungs, muscle, bone, large intestine, small intestine, brain, or fat.

30. The complex or use as claimed in any one of claims 25-28, wherein the complex is retained in PSMA-expressing tumor tissue for a longer interval of time than kidney.

31. The complex or use as claimed in any one of claims 25-28, wherein the cancer is selected from prostate cancer, breast cancer, colorectal cancer, brain cancer, lung cancer, liver cancer, endometrial cancer, bone cancer, ovarian cancer, testicular cancer, skin cancer, pancreatic cancer, uterine cancer, cervical cancer, bladder cancer, esophageal cancer, gastric cancer,

head and neck cancers, or kidney cancer.

32. The complex or use as claimed in Claim 31, wherein the cancer is prostate cancer.