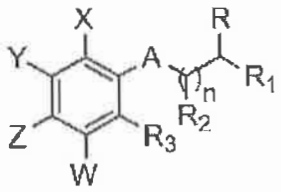
What is claimed is:

1. A compound for use as an agent for imaging cardiac innervation having the structure:




wherein n = 0;

R, $R_1$, $R_2$ and $R_3$ are independently selected from the group consisting of H, $OR_4$, F, Cl, Br, I, $CF_3$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NR_4)OR_5$, $NR_4C(=NR_5)NHR_6$, $C(=NR_4)NHR_5$, $C(=O)NHR_4$, $NR_4C(=O)NR_5$, $NR_4NR_5$, and $SO_2OR_4$;

$R_4$, $R_5$, and $R_6$ are independently selected from the group consisting of H, alkyl, aryl, and heteroaryl substituents;

optionally, wherein any two of $R_4$, $R_5$, or $R_6$ form a cyclic structure selected from the group consisting of $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2$, -CH=CH-, -N=CH-, $-X'-CH_2-$, and $-X'-CH=CH-$,

wherein X' is selected from the group consisting of O, NH, and $NR_7$, and

wherein $R_7$ is selected from the group consisting of alkyl, aryl, and heteroaryl substituents;

wherein one or more of $R_4$, $R_5$, $R_6$, or $R_7$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, imaging moiety (Im), $COOR_8$, $CON(R_8)_2$, $SR_8$, $OR_8$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_8)_2$, $C(=NH)NH_2$, $C(=NR_8)N(R_8)_2$, and $N(R_8)_2$,

wherein $R_8$ is selected from the group of hydrogen, alkyl, aryl, and alkylaryl substituents;

W and X are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, I, $CF_3$, aryl, and heteroaryl; and

A) Y and Z are independently selected from the group consisting of CH, $CH_2$, O, N, $NR_7$, and CH=CH when a linking group Q between Y and Z is present or absent, wherein Q is selected from the group consisting of CH, $CH_2$, $C(R_4)$, N, NH, $N(R_4)$, O, and S;

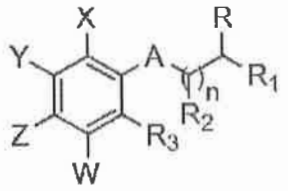
or

B) Y and Z are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, I, $CF_3$, aryl, and heteroaryl when linking group Q is absent;

A is O or absent; and

provided at least one Im is present in either W-Z or R-$R_7$ and is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$.

2. A compound for use as an imaging agent having the structure:




wherein n = 0;

R, $R_1$, $R_2$ and $R_3$ are independently selected from the group consisting of H, $OR_4$, F, Cl, Br, I, $CF_3$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NR_4)OR_5$, $NR_4C(=NR_5)NHR_6$, $C(=NR_4)NHR_5$, $C(=O)NHR_4$, $NR_4C(=O)NR_5$, $NR_4NR_5$, and $SO_2OR_4$ provided at least one of R or $R_1$ is $NR_4C(=NR_5)NHR_6$;

$R_4$, $R_5$, and $R_6$ are independently selected from the group consisting of H, alkyl, aryl, and heteroaryl substituents;

optionally wherein any two of $R_4$, $R_5$, or $R_6$ form a cyclic structure selected from the group consisting of $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2$, -CH=CH-, -N=CH-, $-X'-CH_2-$, and $-X'-CH=CH-$,

wherein X' is selected from the group consisting of O, NH, and $NR_7$, and

wherein $R_7$ is selected from the group consisting of alkyl, aryl, and heteroaryl substituents;

wherein one or more of $R_4$, $R_5$, $R_6$, or $R_7$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, imaging moiety (Im), $COOR_8$, $CON(R_8)_2$, $SR_8$, $OR_8$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_8)_2$, $C(=NH)NH_2$, $C(=NR_8)N(R_8)_2$, and $N(R_8)_2$,

wherein $R_8$ is selected from the group of hydrogen, alkyl, aryl, and alkylaryl substituents;

A is O or absent;

W and X are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, $CF_3$, aryl, and heteroaryl; and

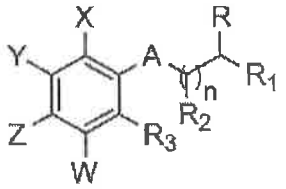
A) Y and Z are independently selected from the group consisting of CH, $CH_2$, O, N, $NR_7$, and CH=CH when a linking group Q between Y and Z is present or absent, wherein Q is selected from the group consisting of CH, $CH_2$, $C(R_4)$, N, NH, $N(R_4)$, O, and S;

or

B) Y and Z are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, I, $CF_3$, aryl, and heteroaryl when linking group Q is absent;

provided at least one Im is present in either W-Z or R-$R_7$ and is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$.

3. A compound for use as an agent for imaging cardiac innervation having the structure:




wherein n = 1;

R, $R_1$, $R_2$, and $R_3$ are independently selected from the group consisting of H, $OR_4$, F, Cl, Br, I, $CF_3$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NR_4)OR_5$, $NR_4C(=NR_5)NHR_6$, $C(=NR_4)NHR_5$, $C(=O)NHR_4$, $NR_4C(=O)NR_5$, $NR_4NR_5$, and $SO_2OR_4$;

wherein $R_4$, $R_5$, and $R_6$ are independently selected from the group consisting of H, alkyl, aryl, and heteroaryl substituents;

optionally, wherein any two of $R_4$, $R_5$, or $R_6$ form a cyclic structure selected from the group consisting of -$CH_2$-$CH_2$-, -$CH_2$-$CH_2$-$CH_2$, -CH=CH-, -N=CH-, -X'-$CH_2$-, and –X'-CH=CH-,

wherein X' is selected from the group consisting of O, NH, and $NR_7$, and

wherein $R_7$ is selected from the group consisting of alkyl, aryl, and heteroaryl substituents;

wherein one or more of $R_4$, $R_5$, $R_6$, or $R_7$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, imaging moiety (Im), $COOR_8$, $CON(R_8)_2$, $SR_8$, $OR_8$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_8)_2$, $C(=NH)NH_2$, $C(=NR_8)N(R_8)_2$, and $N(R_8)_2$,

wherein $R_8$ is selected from the group of hydrogen, alkyl, aryl, and alkylaryl substituents;

W and X are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, $CF_3$, aryl, and heteroaryl;

A) Y and Z are independently selected from the group consisting of CH, $CH_2$, O, N, $NR_7$, and CH=CH when a linking group Q between Y and Z is present or absent, wherein Q is selected from the group consisting of CH, $CH_2$, $CR_4$, N, NH, $NR_4$, O, and S;

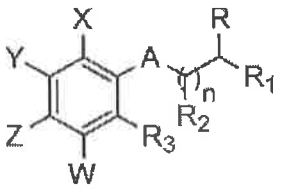
or

B) Y and Z are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, I, $CF_3$, aryl, and heteroaryl when linking group Q is absent;

A is O or absent; and

provided at least one Im is present in either W-Z or R-$R_7$ and is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$.

4. A compound for use as an imaging agent having the structure:




wherein n = 1;

R, $R_1$, $R_2$, and $R_3$ are independently selected from the group consisting of H, $OR_4$, F, Cl, Br, I, $CF_3$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NR_4)OR_5$, $NR_4C(=NR_5)NHR_6$, $C(=NR_4)NHR_5$, $C(=O)NHR_4$, $NR_4C(=O)NR_5$, $NR_4NR_5$, $SO_2OR_4$, provided at least one of R or $R_1$ is $NR_4C(=NR_5)NHR_6$;

wherein $R_4$, $R_5$, and $R_6$ are independently selected from the group consisting of H, alkyl, aryl, and heteroaryl substituents;

optionally, wherein any two of $R_4$, $R_5$, or $R_6$ form a cyclic structure selected from the group consisting of -$CH_2$-$CH_2$-, -$CH_2$-$CH_2$-$CH_2$, -CH=CH-, -N=CH-, -X'-$CH_2$-, and –X'-CH=CH-,

wherein X' is selected from the group consisting of O, NH, and $NR_7$, and

wherein $R_7$ is selected from the group consisting of alkyl, aryl, and heteroaryl substituents;

wherein one or more of $R_4$, $R_5$, $R_6$, or $R_7$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, imaging moiety

(Im), $COOR_8$, $CON(R_8)_2$, $SR_8$, $OR_8$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_8)_2$, $C(=NH)NH_2$, $C(=NR_8)N(R_8)_2$, and $N(R_8)_2$,

wherein $R_8$ is selected from the group of hydrogen, alkyl, aryl and alkylaryl substituents;

A is O or absent;

W and X are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, $CF_3$, aryl, and heteroaryl;

A) Y and Z are independently selected from the group consisting of CH, $CH_2$, O, N, $NR_7$, and CH=CH when a linking group Q between Y and Z is present or absent, wherein Q is selected from the group consisting of CH, $CH_2$, $CR_4$, N, NH, $NR_4$, O, and S;

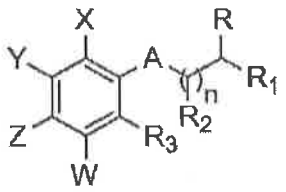
or

B) Y and Z are independently selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, I, $CF_3$, aryl, and heteroaryl when linking group Q is absent;

provided at least one Im is present in either W-Z or R-$R_7$ and is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$.

5. The compound of claim 1, 2, 3, or 4, wherein R is $NR_4C(=NR_5)NHR_6$;

6. The compound of claim 1 or 2 having the structure:




wherein:

n = 0;

A is absent;

X, W, $R_3$, and $R_1$ = H;

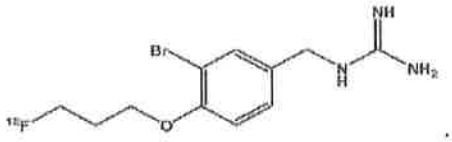
R = $NHC(=NH)NH_2$;

Z is $OR_4$;

$R_4$ is alkyl substituted with an imaging moiety; and

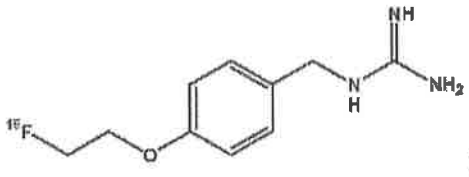
Y is H, F Cl, or Br.

7. A compound having the following structure:

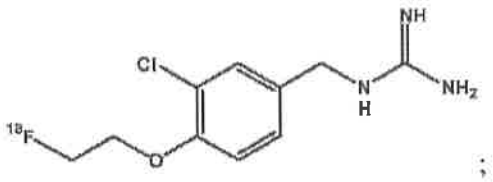


8. A compound having the structure N-[3-bromo-4(3-[$^{18}$F]fluoropropoxy)-benzyl]-guanidine hydrochloride.

9. A compound having a structure selected from the group consisting of:

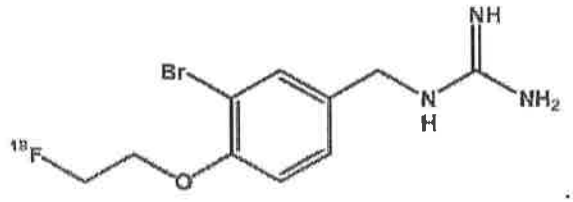


;



;

and



.

10. The compound of claim 1, 2, 3, or 4, wherein any two of $R_4$, $R_5$, or $R_6$ form a cyclic structure selected from the group consisting of -$CH_2$-$CH_2$-, -$CH_2$-$CH_2$-$CH_2$, -CH=CH-, -N=CH-, -X'-$CH_2$-, and -X-CH=CH-;

wherein X' is selected from the group consisting of O, NH, and $NR_7$; and

wherein $R_7$ is selected from the group consisting of alkyl, aryl and heteroaryl substituents.

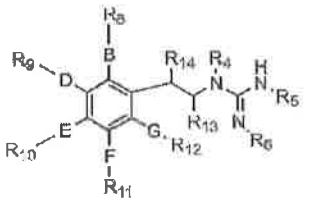
11. The compound of claim 1, 2, 3, 4, or 10, wherein one or more $R_4$ - $R_7$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, Im, $COOR_8$, $CON(R_8)_2$, $SR_8$, $OR_8$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_8)_2$, $C(=NH)NH_2$, $C(=NR_8)N(R_8)_2$, and $N(R_8)_2$;

wherein $R_8$ is selected from the group of hydrogen, alkyl, aryl, and alkylaryl substituents.

12. The compound of claim 1, 2, 3, 4, 10, or 11, wherein the imaging moiety is present in R-$R_7$ or in W-Z when W-Z is $OR_4$, $N(R_4)_2$, aryl, or heteroaryl.

13. The compound of claim 1, 2, 3, 4, 10, 11, or 12, wherein the compound is derivatized with $^{18}F$ in one or more of the following positions, if present: aryl, alkyl, α-keto, benzylic, beta-alkylether, gamma-propylalkylether and beta-propylalkylether.

14. A compound having Structure Delta as follows:



wherein linking groups B, D, E, F, and G are independently selected from the group consisting of a bond, alkyl, aryl, aralkyl, alkylaryl, heteroaryl, alkoxy, alkylamino, aminoalkyl, aryloxy, alkoxyalkyl, thioalkyl, and heterocyclyl;

$R_8$ through $R_{14}$ are independently selected from the group consisting of H, $OR_3$, F, Cl, Br, I, $CH_2F$, $OCH_2CH_2F$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_3$, $CO_2R_3$, and imaging moiety (Im);

$R_3$, $R_4$, $R_5$, and $R_6$ are independently selected from the group consisting of H, alkyl, aryl, aralkyl, heteroaryl, alkylamino, alkoxy, and aryloxy;

optionally any two of $R_4$, $R_5$, $R_6$, $R_{13}$, or $R_{14}$ may form a cyclic structure selected from the group consisting of a bond, -$CH_2$-, -$CH_2$-$CH_2$-, -$CH_2$-$CH_2$-$CH_2$-, -CH=CH-, -N=CH-, -X'-$CH_2$- and -X'-CH=CH-;

wherein X' is selected from the group consisting of O, NH, and $NR_7$, and $R_7$ is selected from the group consisting of alkyl, aryl, and heteroaryl substituents; and

wherein an Im may be present in either $R_3$-$R_7$; and

provided at least one Im is present and is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$; and

provided that when any one of $R_8$-$R_{12}$ is an imaging moiety (Im), the linking group B, D, E, F, or G which attaches the imaging moiety to the phenyl ring contains at least one atom.

15. The compound of claim 14, wherein one or more of the alkyl, aryl or heteroaryl substituents are substituted with a functional group selected from the group consisting of F,

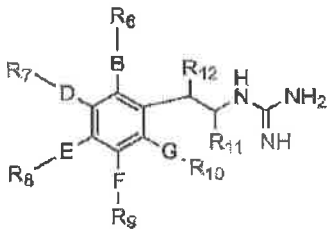
Cl, Br, I, OH, $NH_2$, COOH, Im, COOR, $CONR_2$, SR, OR, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R)_2$, $C(=NH)NH_2$, $C(=NR)N(R)_2$, and $N(R)_2$; and

wherein R is selected from the group consisting of hydrogen, alkyl, aryl or alkylaryl.

16. The compound of claim 14 or 15, wherein one or more of the alkyl, aryl or heteroaryl substituents of $R_3 - R_6$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, Im, $COOR_{15}$, $CON(R_{15})_2$, $SR_{15}$, $OR_{15}$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_{15})_2$, $C(=NH)NH_2$, $C(=NR_{15})N(R_{15})_2$, and $N(R_{15})_2$; and

wherein $R_{15}$ is selected from the group consisting of hydrogen, alkyl, aryl and alkylaryl.

17. A compound having Structure II as follows:




wherein linking groups B, D, E, F and G are independently selected from the group consisting of a bond, alkyl, aryl, aralkyl, alkylaryl, heteroaryl, alkoxy, alkylamino, aminoalkyl, aryloxy, alkoxyalkyl, thioalkyl, and heterocyclyl;

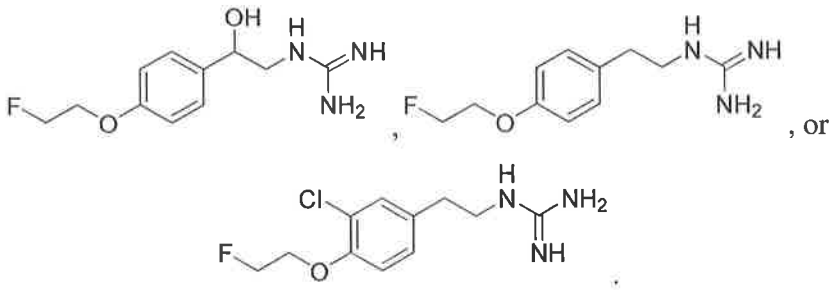
$R_6$ through $R_{12}$ are independently selected from the group consisting of H, $OR_4$, F, Cl, $CF_3$, Br, I, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NH)NHR_5$, $C(=O)NHR_5$, $NHC(=O)NR_5$, $NHNR_5$, $SO_2OR_5$, and imaging moiety (Im); and

wherein $R_4$ and $R_5$ are selected from the group consisting of H, alkyl, aryl, and heteroaryl substituents, and

provided at least one imaging moiety is present, said imaging moiety (Im) being selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, $^{111}In$, and $^{90}Y$, and

provided that when any one of $R_6$-$R_{10}$ is an imaging moiety (Im), the linking group B, D, E, F, or G which attaches the imaging moiety to the phenyl ring contains at least one atom.

18. The compound having the structure selected from the group consisting of:




wherein, F is $^{18}F$.

19. The compound of any one of claims 1-6 or 10-17, wherein the imaging moiety is $^{18}F$.

20. The compound of any one of claims 1-6, 10-17 or 19, wherein $R_4$ is alkyl or aryl and is substituted with $^{18}F$.

21. A salt of a compound of any one of claims 1-20.

22. A composition comprising a compound of any one of claims 1-20 or a salt of claim 21 and one or more excipients.

23. A method of imaging cardiac innervation comprising the steps of:

administering an effective amount of the compound of any one of claims 1-20 or a salt of claim 21 or a composition of claim 22 to a patient;

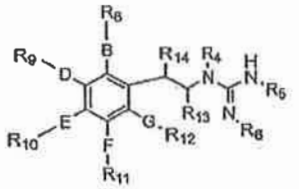
detecting radiation emitted by said compound; and

forming an image therefrom.

24. A compound according to any one of claims 1-4, 7-9, 14, 17, and 18, substantially as hereinbefore described, with reference to the Examples and/or Figures.

What is claimed is:

1. A compound having Structure Delta as follows:



wherein linking groups B, D, E, F, and G are independently selected from the group consisting of a bond, alkyl, aryl, aralkyl, alkylaryl, heteroaryl, alkoxy, alkylamino, aminoalkyl, aryloxy, alkoxyalkyl, thioalkyl, and heterocyclyl;

$R_8$ through $R_{14}$ are independently selected from the group consisting of H, $OR_3$, F, Cl, Br, I, $CH_2F$, $OCH_2CH_2F$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_3$, $CO_2R_3$, and image moiety Im; and

$R_3$, $R_4$, $R_5$, and $R_6$ are independently selected from the group consisting of H, alkyl, aryl, aralkyl, heteroaryl, alkylamino, alkyloxy, and aryloxy.

2. The compound of claim 1, wherein said compound includes at least one Im attached to at least one of said linking groups B, D, E, F or G.

3. The compound of claim 1, wherein one or more of the alkyl, aryl or heteroaryl substituents are substituted with a functional group selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, Im, COOR, $CONR_2$, SR, OR, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)NR_2$, $C(=NH)NH_2$, $C(=NR)NR_2$ and $NR_2$;

and wherein R and $R_2$ are selected from the group consisting of hydrogen alkyl, aryl or alkylaryl.

4. The compound as in claim 1, wherein any two of $R_4$, $R_5$, $R_6$, $R_{13}$, or $R_{14}$ may form a cyclic structure selected from the group consisting of a bond, $-CH_2-$, $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$, -CH=CH-, -X=CH-, and -X-CH=CH-,

wherein X is selected from the group consisting of O, NH, N=, and $NR_7$, and

$R_7$ is selected from the group consisting of alkyl, aryl and heteroaryl substituents.

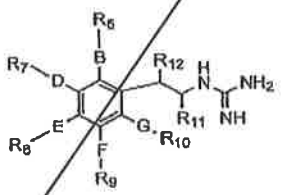
5. The compound as in claim 1, wherein one or more of $R_8$-$R_{12}$ is an imaging moiety, and one of said linking groups B, D, E, F or G, which attaches said imaging moiety to the phenyl ring, contains at least one atom.

6. The compound of claim 1, wherein said imaging moiety Im is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$.

7. The compound of claim 1, wherein one or more of the alkyl, aryl or heteroaryl substituents of $R_3 - R_6$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, Im, $COOR_{15}$, $CON(R_{15})_2$, $SR_{15}$, $OR_{15}$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_{15})_2$, $C(=NH)NH_2$, $C(=NR_{15})N(R_{15})_2$ and $N(R_{15})_2$,

wherein $R_{15}$ is selected from the group consisting of hydrogen, alkyl, aryl and alkylaryl.

8. A compound having Structure II as follows:




wherein linking groups B, D, E, F and G are independently selected from the group consisting of a bond, alkyl, aryl, aralkyl, alkylaryl, heteroaryl, alkoxy, alkylamino, aryloxy, alkoxyalkyl, and heterocyclic; and

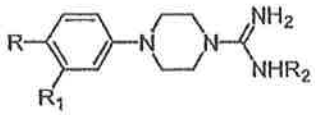
$R_6$ through $R_{12}$ are independently selected from the group consisting of H, $OR_4$, F, Cl, $CF_3$, Br, I, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NH)NHR_5$, $C(=O)NHR_5$, $NHC(=O)NR_5$, $NHNR_5$, $SO_2OR_5$, and Im,

wherein $R_4$ and $R_5$ are selected from the group consisting of H, alkyl, aryl and heteroaryl substituents.

9. The compound of claim 8, wherein one or more $R_6$-$R_{10}$ is an imaging moiety, and one of said linking elements B, D, E, F or G, which attaches said imaging moiety to the phenyl ring, contains at least one atom.

10. The compound of claim 8 , wherein said imaging moiety is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, $^{111}In$, and $^{90}Y$.

11. A compound having Structure Chi as follows:



wherein R, $R_1$ and $R_2$ are independently selected from the group consisting of H, $OR_3$, F, Cl, Br, I, $CH_2F$, $OCH_2CH_2F$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, aralkyl, alkylaryl, $C(=O)R_3$, $CO_2R_3$, Im, and $OCH_2CH_2Im$; and

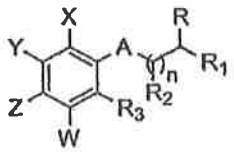
wherein $R_3$ is selected from the group consisting of H, alkyl, aryl and heteroaryl substituents.

12. The compound of claim 11, wherein Im is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, and $^{131}I$.

13. The compound of claim 11, wherein one of the alkyl, aryl, heteroaryl, aralkyl, alkylaryl groups are substituted with a functional group selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, Im, $COOR_4$, $CON(R_4)_2$, $SR_4$, $OR_4$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_4)_2$, $C(=NH)NH_2$, $C(=NR_4)N(R_4)_2$ and $N(R_4)_2$,

wherein $R_4$ is selected from the group consisting of hydrogen, alkyl, aryl and alkylaryl substituents.

14. A compound having Structure Alpha as follows:



wherein n = 0, 1, 2 or 3; and R, $R_1$, $R_2$ and $R_3$ are independently selected from the group consisting of H, $OR_4$, F, Cl, Br, I, $CF_3$, alkyl ($C_1$-$C_4$), aryl, heteroaryl, $C(=O)R_4$, $CO_2R_4$, $N(R_4)_2$, CN, $C(=NR_4)OR_5$, $NR_4C(=NR_5)NHR_6$, $C(=NR_4)NHR_5$, $C(=O)NHR_4$, $NR_4C(=O)NR_5$, $NR_4NR_5$, $SO_2OR_4$, and Im,

wherein $R_4$, $R_5$, and $R_6$ are selected from the group consisting of H, alkyl, aryl and heteroaryl substituents;

W, X, Y and Z can independently be selected from the group consisting of H, $OR_4$, $N(R_4)_2$, F, Cl, Br, I, $CF_3$, Im, aryl, and heteroaryl; and

A is O or absent.

15. The compound of claim 14 wherein any two of $R_4$, $R_5$, or $R_6$ form a cyclic structure selected from the group consisting of $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2$, -CH=CH-, -X=CH-, and -X-CH=CH-,

wherein X is selected from the group consisting of O, NH, N=, and $NR_7$, and

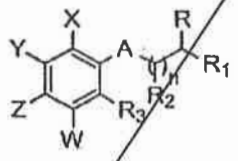
wherein $R_7$ is selected from the group consisting of alkyl, aryl and heteroaryl substituents.

16. The compound of claim 15, wherein one or more $R_4 - R_7$ may be substituted with various functional groups selected from the group consisting of F, Cl, Br, I, OH, $NH_2$, COOH, Im, $COOR_8$, $CON(R_8)_2$, $SR_8$, $OR_8$, $NHC(=NH)NH_2$, $NHC(=O)NH_2$, $NHC(=O)N(R_8)_2$, $C(=NH)NH_2$, $C(=NR_8)N(R_8)_2$ and $N(R_8)_2$,

wherein $R_8$ is selected from the group of hydrogen, alkyl, aryl and alkylaryl substituents.

17. The compound of claim 14, wherein Im is selected from the group consisting of $^{18}F$, $^{76}Br$, $^{124}I$, $^{131}I$, $^{99m}Tc$, $^{153}Gd$, and $^{111}In$.

18. A compound having Structure Alpha as follows:




where X, W, R and $R_3$ are hydrogen;

$R_1$ is $NHC(=NH)NH_2$;

linking group A and $R_1$ are directly connected by an ethylene bridge;

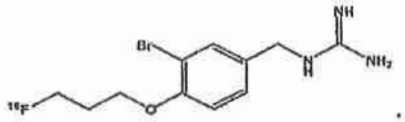
Y is Br;

Z is $OCH_2CH_2Im$; and

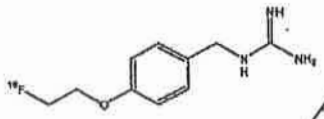
Im is $^{18}F$.

19. The compound of claim 14, further comprising linking group Q between Y and Z; wherein Q is selected from the group consisting CH, $CH_2$, N, NH, and O.

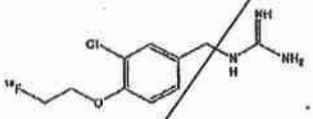
20. A compound having the following structure:



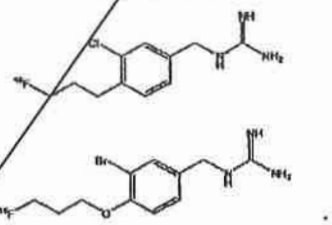
21. A compound having the following structure:



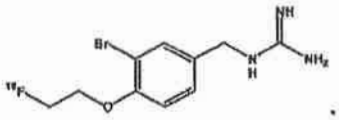
22. A compound having the following structure:



23. A compound having the following structure:



24. A compound having the following structure:



25. A method of imaging cardiac innervation comprising the steps of:
administering an effective amount of the compound of claim 20 to a patient;
detecting gamma radiation emitted by said compound; and
forming an image therefrom.