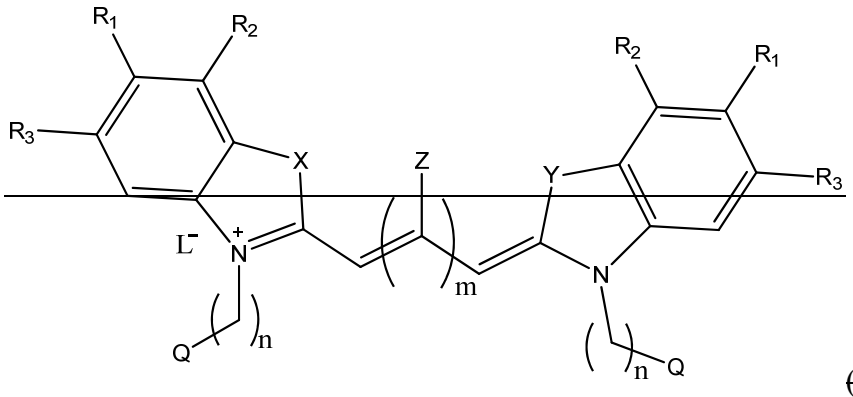
~~What is claimed is:~~

Claims

1. A near-infrared fluorescent contrast agent ~~according to Formula (I):~~



~~(Formula I)~~

~~Wherein~~

~~Each R_1 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;~~

~~Each R_2 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;~~

~~Or R^1 and R^2 can be taken together with the carbon atoms to which they are attached to form a 5-6 membered aryl or heteroaryl ring, optionally substituted with halogen, alkyl, alkoxy, hydroxyl, $-SO_2OH$, or $-CO_2H$;~~

~~Each R_3 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;~~

~~Q is H, alkyl optionally substituted with alkoxy, cycloalkyl, heterocycloalkyl, aryl, arylalkyl, heteroaryl, heteroarylalkyl, N^+(alkyl)$_3$, -OCO-alkyl, $-SO_2OH$, phenyl, sulfonato, phosphates, KUE, GPI, or $NR_3R_4R_5$, wherein R_3, R_4 and R_5 are each independently for each occurrence H or C_1-C_4 alkyl, or R_4 and R_5, taken together with the nitrogen atom to which they are attached, form a heterocyclic ring;~~

~~X and Y are each independently O, S, Se, C(R")$_2$, NR"';~~

~~Z is H, halogen, CN, R_6, OR_6, SR_6, NHR_6 or CH_2R_6, in which R_6 is optionally substituted C_1-C_6 alkyl, optionally substituted aryl, or optionally substituted heteroaryl, alkyl-N_3, aryl-N_3, aryl-halogen;~~

~~Each R' is independently H, alkyl or aryl;~~

~~Each R" is independently H or alkyl;~~

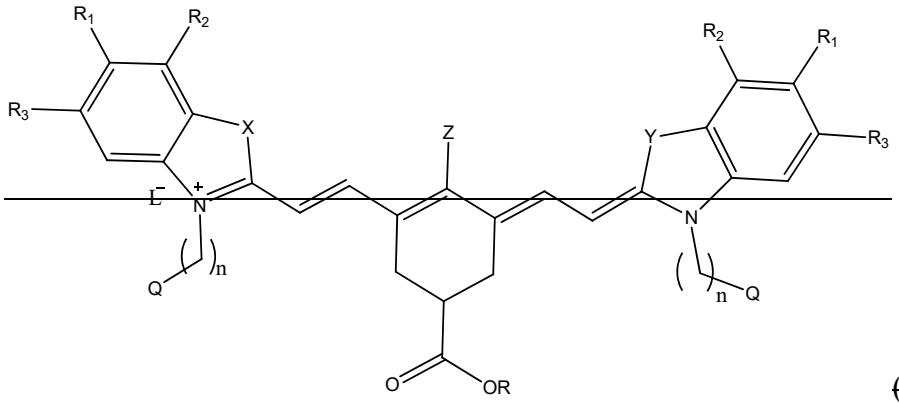
~~Each R"' is independently H, akyl, akyl-SO_3H, or akyl-COOH;~~

~~m and n are independently an integer from 0-3; and~~

~~L is an anion;~~

~~or a salt, solvate, hydrate, polymorph, prodrug, or stereoisomer thereof.~~

~~2. A near-infrared fluorescent contrast agent according to Formula (II):~~



~~(~~**~~Formula II~~**~~)~~

~~Wherein~~

~~Each R_1 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;~~

~~Each R_2 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;~~

~~Or R^1 and R^2 can be taken together with the carbon atoms to which they are attached to form a 5-6 membered aryl or heteroaryl ring, optionally substituted with halogen, alkyl, alkoxy, hydroxyl, -SO_2OH, or -CO_2H;~~

~~Each R_3 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;~~

~~Q is H, alkyl optionally substituted with alkoxy, cycloalkyl, heterocycloalkyl, aryl, arylalkyl, heteroaryl, heteroarylalkyl, $N^+(alkyl)_3$, -OCO-alkyl, $-SO_2OH$, phenyl, sulfonato, phosphates, KUE, GPI, or $NR_3R_4R_5$, wherein R_3, R_4 and R_5 are each independently for each occurrence H or C_1-C_4 alkyl, or R_4 and R_5, taken together with the nitrogen atom to which they are attached, form a heterocyclic ring;~~

~~X and Y are each independently O, S, Se, $C(R")_2$, NR;~~

~~Z is H, halogen, CN, R_6, OR_6, SR_6, NHR_6 or CH_2R_6, in which R_6 is optionally substituted C_1-C_6 alkyl, optionally substituted aryl, or optionally substituted heteroaryl, alkyl-N_3, aryl-N_3, aryl-halogen;~~

~~R is independently H, OR"'' (where R = H, akyl, or aryl, NH_2, NHR, alkyl-NH_2, alkyl-COOH),~~

~~L is an anion;~~

~~Each R' is independently H, alkyl or aryl;~~

~~Each R" is independently H or alkyl;~~

~~Each R"' is independently H, akyl, akyl-SO_3H, or akyl-COOH;~~

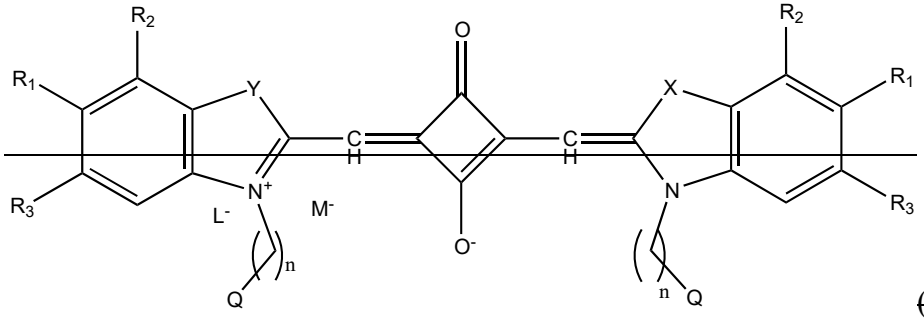
~~Each R"'' is independently H, akyl, or aryl, NH_2, NHR, alkyl-NH_2, or alkyl-COOH;~~

~~m and n are independently an integer from 0-3; and~~

~~L is an anion;~~

~~or a salt, solvate, hydrate, polymorph, prodrug, or stereoisomer thereof.~~

~~3. A near-infrared fluorescent contrast agent according to Formula (III):~~



~~(Formula III)~~

wherein

Each R_1 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;

Each R_2 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;

Or R^1 and R^2 can be taken together with the carbon atoms to which they are attached to form a 5-6 membered aryl or heteroaryl ring, optionally substituted with halogen, alkyl, alkoxy, hydroxyl, $-SO_2OH$, or $-CO_2H$;

Each R_3 is independently H, OR', halogen, sulfonato, substituted or unsubstituted amino, C(O)NH-C_1-C_6 alkyl, C_1-C_6 alkyl, C_1-C_6 alkoxy or phenyl;

Q is H, alkyl optionally substituted with alkoxy, cycloalkyl, heterocycloalkyl, aryl, arylalkyl, heteroaryl, heteroarylalkyl, N^+(alkyl)$_3$, -OCO-alkyl, $-SO_2OH$, phenyl, sulfonato, phosphates, KUE, GPI, or $NR_3R_4R_5$, wherein R_3, R_4 and R_5 are each independently for each occurrence H or C_1-C_4 alkyl, or R_4 and R_5, taken together with the nitrogen atom to which they are attached, form a heterocyclic ring;

X and Y are each independently O, S, Se, C(R")$_2$, NR'"; Z is H, halogen, CN, R_6, OR_6, SR_6, NHR_6 or CH_2R_6, in which R_6 is optionally substituted C_1-C_6 alkyl, optionally substituted aryl, or optionally substituted heteroaryl, alkyl-N_3 (for click chemistry), aryl-N_3 (for click chemistry), aryl-halogen (only for palladium catalyzed reactions);

Each R' is independently H, alkyl or aryl;

Each R" is independently H or alkyl;

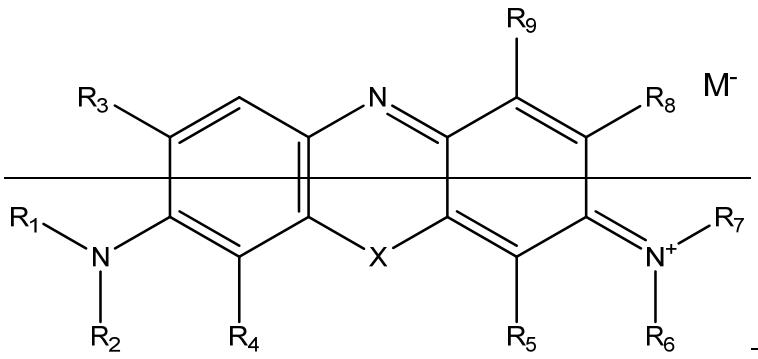
Each R"' is independently H, akyl, akyl-SO_3H, or akyl-COOH;

m and n are independently an integer from 0-3; and

L is an anion ;

or a salt, solvate, hydrate, polymorph, prodrug, or stereoisomer thereof.

4. A near-infrared fluorescent contrast agent according to Formula (IV):



~~(**Formula IV**)~~

~~wherein~~

~~R_1, R_2, R_3, R_4, R_6 and R_7 are each independently H or C_1-C_6 alkyl;~~

~~R_5, R_8 and R_9 are each independently H, CN, OH, or C_1-C_6 alkyl;~~

~~or R_1 and R_3, taken together with the atoms to which they are connected, form a 5- to 6-membered heterocylic ring;~~

~~or R_2 and R_4, taken together with the atoms to which they are connected, form a 5- to 6-membered heterocylic ring;~~

~~or R_5 and R_6, taken together with the atoms to which they are connected, form a 5- to 6-membered heterocylic ring;~~

~~or R_7 and R_8, taken together with the atoms to which they are connected, form a 5- to 6-membered heterocylic ring;~~

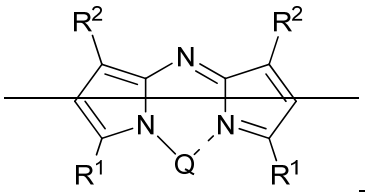
~~or R_8 and R_9, taken together with the atoms to which they are connected, form an aryl or heteroaryl ring;~~

~~X is O, S, Se, N-R; where R = H or C_1-C_6 alkyl; and~~

~~M^- is an anion~~

~~or a salt, solvate, hydrate, polymorph, prodrug, or stereoisomer thereof.~~

~~5. A near-infrared fluorescent contrast agent according to Formula (V):~~



~~(**Formula V**)~~

~~Wherein:~~

~~Q is $B(R^3)_2$; $Si(R^3)_2$~~

~~Each R^1 is independently H, alkyl, aryl, or heteroaryl, wherein each alkyl, aryl, or heteroaryl is optionally substituted with alkoxy, alkoxy-N^+(alkyl)$_3$, alkoxy-OH, halogen, or COOH;and~~

~~Each R^2 is independently H, alkyl, aryl, or heteroaryl, wherein each alkyl, aryl, or heteroaryl is optionally substituted with alkoxy, alkoxy-N^+(alkyl)$_3$, alkoxy-OH, halogen, or COOH; and~~

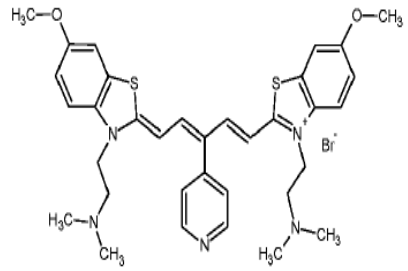
~~Each R^3 is independently H, F, or alkyl; OH~~

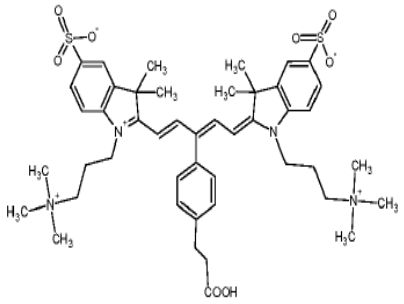
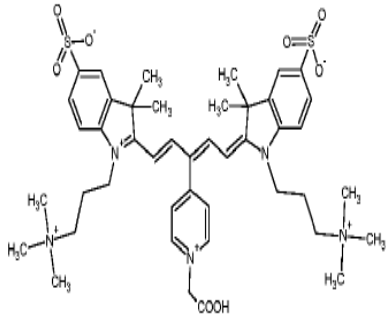
~~or a salt, solvate, hydrate, polymorph, prodrug, or stereoisomer thereof.~~

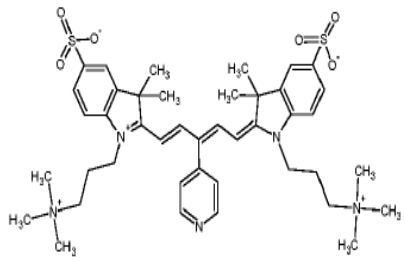
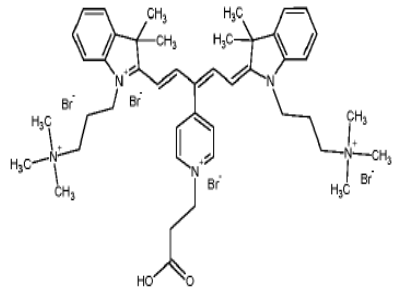
~~6. A near-infrared imaging agent~~ represented by the formula:

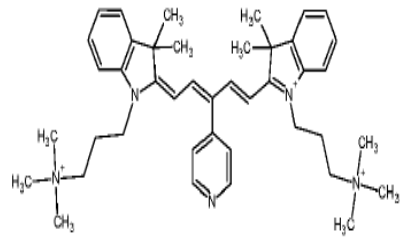
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Name	Structure		Name	Structure	
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~~PTN1~~		;	~~ZK124~~		;
~~SP56~~		;	~~ZK126~~		;
~~QBN1~~		;	~~ZK101~~		;

Name	Structure		Name	Structure	
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~~ZK195~~		;	~~TG16~~		;
~~A71~~		;	~~MDL16~~		;
YY187		,	~~CNN14~~		;
~~CNN6~~		;	~~LN37~~		;

Name	Structure		Name	Structure	
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TG53		,	~~LO4~~		;
~~CNN 4~~		;	~~ZK21 1~~		;
~~CNN 5~~		;	~~ZK21 4~~		;

Name	Structure		Name	Structure	
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Name	Structure		Name	Structure	
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~~ZK190~~		;	~~YY238~~		;

Name	Structure		Name	Structure	
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~~ZK50~~		;	~~PS31~~		;
~~SP59~~		;	~~ZK239~~		;
~~JM1~~		;	~~AL11~~		;
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Name	Structure		Name	Structure	
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~~ZK38~~		;	~~CMI26~~		;
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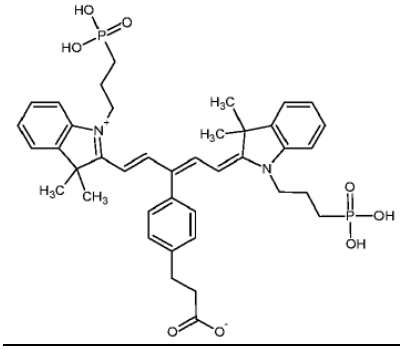
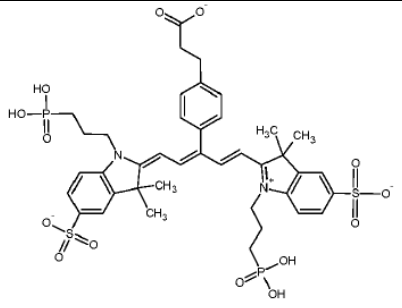
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Name	Structure		Name	Structure	
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~~AL30~~		;	~~E44~~		;
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~~AL35~~		;	~~E51~~		;

Name	Structure		Name	Structure	
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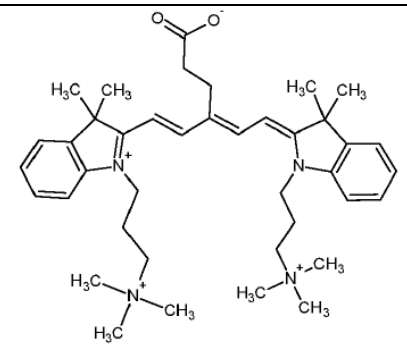
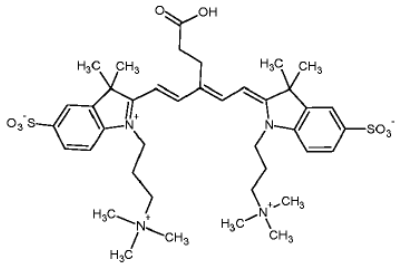
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~~SP33~~		;	~~ESS61~~		;
~~SP43~~		;	~~LO1~~		;
~~SP49~~		;	~~LO2~~		;

Name	Structure		Name	Structure	
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~~SP53~~		;	~~MHI106~~		;
~~SP79~~		;	~~MHI128~~		;
~~SP99~~		;	~~MHI84~~		;
~~SP116~~		;	~~MHI86~~		;

Name	Structure		Name	Structure	
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~~ZK185~~		;	P700H		,
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~~ZK198~~		;	~~P800H~~		;

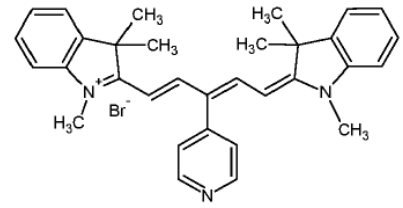
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~~TG5~~		;	~~T18~~		;
~~TG7~~		;	~~T20~~		;

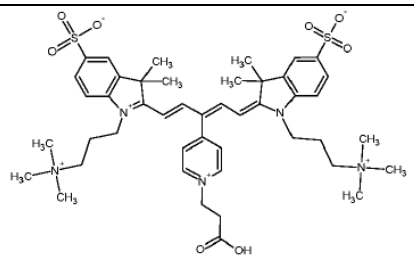
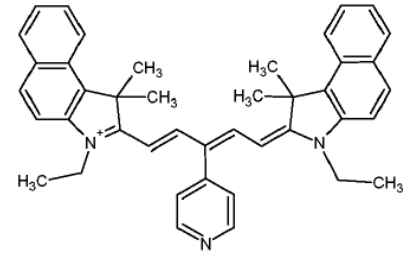
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~~QBN 14~~		;	~~T27~~		;
~~CNN 154~~		;	~~T29~~		;

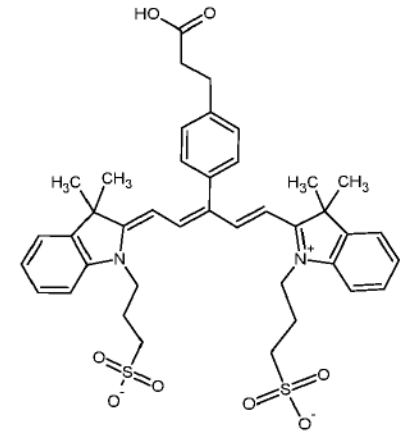
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~~ZK14 8~~		;	A104		,

Name	Structure		Name	Structure	
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~~E72~~		;	~~A134~~		;
~~ZK159~~		;	~~A138~~		;
~~E70~~		;	~~A146~~		;
~~ZK153~~		;	~~A148~~		;
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Name	Structure		Name	Structure	
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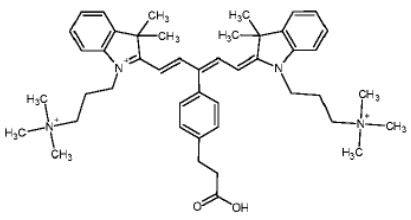
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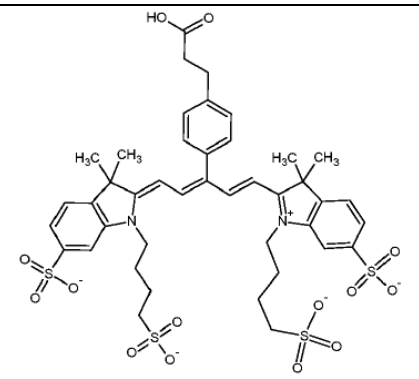
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~~ZK15~~		;	~~A64~~		;
WuA108		,	~~MHI85~~		;

Name	Structure		Name	Structure	
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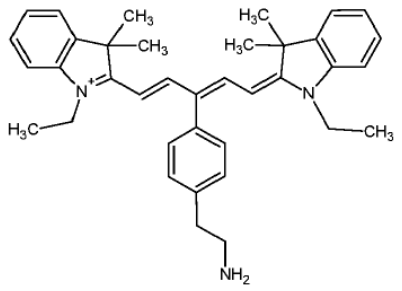
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~~CNN3~~		;	~~EAO76~~		;
~~AL20~~		;	~~PS101A~~		;
~~TG115~~		;	~~PS35~~		;

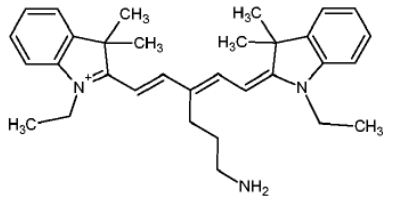
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~~ZK48~~		;	~~PS52~~		;
TG44		,	~~PS62~~		;
~~ZK27~~		;	~~PS73~~		;

Name	Structure		Name	Structure	
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~~ZK79~~		;	~~YY260~~		;
~~WuA38~~		;	~~YY261~~		;
~~LN68~~		;	~~YY269~~		;

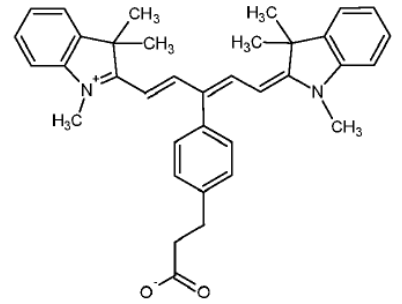
Name	Structure		Name	Structure	
~~ESS13~~		;	~~ZK243~~		;
WuA110		,	~~ZK2515~~		;
~~YY161~~		;	~~ZK2525~~		;
~~E71~~		;	~~ZK2565~~		;
~~CNN8~~		;	~~ZK2566~~		;

Name	Structure		Name	Structure	
~~CNN10~~		;	~~ZK258~~		;
~~LN68Boc~~		;	~~ZK2615~~		;
~~TG60~~		;	~~A71-NHS~~		;
~~ZK78~~		;	~~LN15-NHS~~		;
~~ZK133~~		;	~~PS126~~		;

Name	Structure		Name	Structure	
~~CNN 7~~		;	~~PS127~~		;
~~ZK23~~		;	~~PS128~~		;
~~MDL 17~~		;	~~PS129~~		;
~~TG11 A~~		;	~~PS130~~		;
~~TG11 B~~		;	PS131		,

Name	Structure		Name	Structure	
~~TP2~~		;	~~PS132~~		;
~~LN50~~		;	PS133		,
~~TG17~~		;	~~YY283~~		;
~~TG22~~		;	~~YY284~~		;
~~LN34~~		;	~~YY285~~		;
~~CNN16~~		;	~~YY294~~		;

Name	Structure		Name	Structure	
~~CNN12~~		;	~~YY295~~		;
~~CNN145~~		;	~~YY2102~~		;
~~ZK203~~		;	~~YY2103~~		;
~~ZK204~~		;	~~YY2106~~		;
~~ZK208~~		;	~~YY2107~~		;
~~ZK196~~		;	~~L700-1A~~		;

Name	Structure		Name	Structure	
~~WuA 67~~		;	L700-1C		;
~~WuA 76~~		;	~~L800-1A~~		;
		;	~~L800-1C~~		;

27. The near-infrared imaging agent of ~~C~~claim 1~~6~~, represented by the formula:~~LN15, CNN4, AL71, CNN6, SP56, LN50,~~ P700SO3, or~~P800SO3, T14, E16, MHI96, NRB1, ZK211, PS31, AH34, QBN1, PS62, LN65, TG66, E24, AL29, ZK198, ZK166, A106, AL30, ZK189, ZK214, SP66, MHI86, PS127, PS126, LN15-NHS, A71-NHS, Dex70k-LN15, Dex70k-ZW800-1, CNN2, AL31, CNN4, LN50, LN66, Zk48; L700-1A,~~ L700-1C.~~, L800-1A, or L800-1C~~

3. The near-infrared imaging agent of claim 1 or 2, represented by the formula: P700SO3.

4. The near-infrared imaging agent of claim 1, represented by the formula: TG42.

58. A method of imaging tissue, lumens, or cells, the method comprising:

(a) contacting the tissue, lumen, or cells with an imaging agent according to any one of Claims 1-~~47~~47;

(b) irradiating the tissue, lumen, or cells at a wavelength absorbed by the compound;

(c) and detecting a signal from the compound, thereby imaging the tissue, lumen, or cells.

~~9. The method of Claim 8, wherein the imaging agent is: A104, A106, A146, A148, A149, A150, A160, A161, A20, A24, A64, A71, A80, AC2, AC8, AH34, AL11, AL12, AL20, AL22, AL25, AL27, AL29, AL30, AL31, AL33, AL79, CMI24, CMI26, CNN10, CNN12, CNN13, CNN14, CNN145, CNN16, CNN17, CNN2, CNN3, CNN4, CNN5, DL17, E16, E24, E27, E36, E37, E38, E39, E43, E44, E45, E50, E51, E58, E59, E60, E70, E72, E77, E78, E79, E80, E81, EAO40, EAO42, ES17, ES21, ESS61, JM1, LN15, LN50, LN63, LN65, LN66, LN68, LO1, LO2, LO3, LO4, LS1, MDL16, MDL17, MHI103, MHI106, MHI128, MHI184, MHI186, MHI84, MHI86, MHI96, MHI97, MM21, MM25, NRB1, NRB2, Ox170, Ox4, Ox750, P700H, P700SO3, P800H, P800SO3, PS31, PS37, PS62, PTN1, PTN11, PTN12, PTN6, QBN1, QBN14, SP116, SP117, SP27, SP28, SP29, SP30, SP33, SP34, SP43, SP49, SP51, SP53, SP56, SP59, SP60, SP64, SP66, SP67, SP72, SP79, SP99, SR89, SR94, SRA89, T14, T17, T18, T20, T23, T24, T25, T27, T29, TG115, TG42, TG5, TG66, TP1, TP5, WuA108, WuA110, WuA38, WuA71, WuA96, YY161, YY163, YY165, YY180, YY187, YY261, YY269, ZK101, ZK104, ZK106, ZK126, ZK133, ZK134, ZK135, ZK14, ZK140, ZK143, ZK148, ZK150, ZK153, ZK154, ZK155, ZK156, ZK159, ZK166, ZK169, ZK172, ZK184, ZK185, ZK189, ZK190, ZK195, ZK197, ZK198, ZK204, ZK208, ZK211, ZK214, ZK215, ZK23, ZK240, ZK244, ZK26, ZK27, ZK29, ZK46, ZK48, ZK50, ZK59, ZK78, or ZK79.~~

~~10. The method of Claim 8, wherein the imaging agent is: LN15, A104, TG42, or A71.~~

611. The method of ~~any one of~~ claim~~s~~ 5~~8-10~~, wherein the tissue or cells are blood vessels, lumens, ureters, cartilage, bone, thyroid, parathyroids, adrenal gland, salivary gland, white adipose tissue, brown adipose tissue, ovarian cells, testicular cells, seminal vesicles, prostate, pancreas, spleen, gallbladder, bile ducts, Peyer's patches, brain grey matter, brain white matter, brain vasculature, choroid plexus, cerebrospinal fluid, nerves, thoracic duct, pan lymph nodes, sentinel lymph nodes, vulnerable plaque, stem cells, or neuroendocrine tumors.

712. The method of ~~any one of~~ claim~~s~~ 5~~8-10~~, wherein the imaging agent is to be administered to an organism comprising the tissue, lumen, or cells~~.~~

~~13. The method of claim 12~~, wherein the organism preferably is human.

814. The method of any one of claims 5-7~~8-13~~, wherein the imaging agent has peak absorbance at about 600 nm to 850 nm.

~~15. The method of any one of claims 8-14, wherein the imaging agent is: LN15, A104, or TG42; and the wavelength in the 660-700 nm range.~~

~~16. The method of any one of claims 8-14, wherein the imaging agent is A71; and the wavelength in the 760-800 nm, range.~~

917. The method of any one of claims 5-8~~-16~~, wherein the tissue or cells is imaged *ex vivo*.

~~18. The method of any one of claims 8-17, where the imaging agent further comprises a PEG-moiety.~~

19. The method of any one of claims 8-18, where the imaging agent further comprises a radioisotope for either single-photon emission computed tomography (SPECT) or positron emission tomography (PET).

20. The method of any one of claims 8-19, wherein the compound comprises a reactive linking group, such as NHS ester, sulfo-NHS ester, or a TFP ester.

21. The method of any one of claims 8-20, wherein the compound comprises a chelator moiety capable of chelating a metal atom.

22. The method of claim 21, wherein the chelator moiety is a DOTA, DTPA, HYNIC, or desferoxime, or a derivative thereof.

23. A method for imaging lumens, the method comprising:

(a) contacting the lumen with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the lumen.

24. The method according to Claim 18, wherein the imaging agent is LN15, A104, or TG42; and the irradiating wavelength is in the 660-700 nm range.

25. The method according to Claim 18, wherein the imaging agent is A71 or WuA71; and the irradiating wavelength is in the 760-800 nm range.

26. A method for imaging ureters, the method comprising:

(a) contacting the ureters with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the ureters.

~~27. The method according to Claim 21, wherein the imaging agent is LN15, A104, or TG42; and the irradiating wavelength is in the 660-700 nm range.~~

~~28. The method according to Claim 21, wherein the imaging agent is A71 or WuA71; and the irradiating wavelength is in the 760-800 nm, range.~~

~~29 A method for imaging cartilage cells and/or their products, the method comprising:~~

~~(a) contacting the cartilage cells and/or their products with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the tissue at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the cartilage cells and/or their products.~~

~~30. The method according to Claim 23, wherein the imaging agent is SP56, YY180, E58, E59, E60, A196, E71, E72, or ZK15; and the irradiating wavelength is in the 660-700 nm range.~~

~~31. The method according to Claim 23, wherein the imaging agent is LN50, A64, AL30, MM25, MM21, AL31, AL33, SP79, SP99, SP116, SP117, LN65, LN68, LN63, ZK48, CNN3, or CNN4; and the irradiating wavelength is in the 760-800 nm range.~~

~~32. A method for imaging bone cells and/or their products, the method comprising:~~

~~(a) contacting the bone cells and/or their products with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the tissue at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the bone cells and/or their products.~~

33. The method according to Claim 26, wherein the imaging agent is P700SO3, P700H, CMI24, E24, E37, E38, E44, or WuA110; and the irradiating wavelength is in the 660-700 nm range.

34. The method according to Claim 26, wherein the imaging agent is P800SO3, P800H, ZK197, or WuA71; and the irradiating wavelength is in the 760-800 nm, range.

35. A method for imaging the thyroid gland, the method comprising:

(a) contacting the thyroid gland with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the thyroid gland.

36. The method according to Claim 29, wherein the imaging agent is T14, T27, T29, MHI84, T18, T20, T23, T24, T25, LO4, E27, E45, MHI106, MHI128, TP1, NRB3, SP28, SP29, SP30, SP33, SP34, SP51, SP59, SP60, SP72, PTN11, PTN12, ZK26, ZK143, ZK148, or ZK204; and the irradiating wavelength is in the 660-700 nm range.

37. The method according to Claim 29, wherein the imaging agent is QBN14, QBN1, AL20, ZK172, ZK185, ZK190, ZK208, MDL17, CNN145, ZK154, or ZK159; and the irradiating wavelength is in the 760-800 nm range.

38. A method for imaging the parathyroid gland, the method comprising:

(a) contacting the parathyroid gland with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the parathyroid gland.

~~39. The method according to Claim 32, wherein the imaging agent is T14, T27, T29, or MHI84; and the irradiating wavelength is in the 660-700 nm range.~~

~~40. The method according to Claim 32, wherein the imaging agent is QBN14, MDL17, QBN1, or AL20; and the irradiating wavelength is in the 760-800 nm range.~~

~~41. A method for imaging the adrenal gland, the method comprising:~~

~~(a) contacting the adrenal gland with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the tissue at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the adrenal gland.~~

~~42. The method according to Claim 35, wherein the imaging agent is E16, MHI96, MHI97, EAO40, MHI186, LS1, LO3, LO4, E24, E27, E36, E37, E43, E45, E50, E51, E77, E79, E80, ZK50, ZK59, ZK106, SP29, SP30, SP33, SP51, SP53, SP60, SP64, YY161, YY163, or YY165; and the irradiating wavelength is in the 660-700 nm range.~~

~~43. The method according to Claim 35, wherein the imaging agent is AL27, AL25, AL29, ZK190, ZK184, or MDL17; and the irradiating wavelength is in the 760-800 nm range.~~

~~44. A method for imaging the salivary gland, the method comprising:~~

~~(a) contacting the salivary gland with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the tissue at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the salivary gland.~~

45. The method according to Claim 38, wherein the imaging agent is NRB1, ZK195, ZK135, NRB2, YY163, ZK195, YY161, E79, TP1, SP28, SP29, SP30, SP49, SP72, ZK101, ZK133, ZK134, ZK135, ZK143, ZK150, ZK155, ZK156, ZK159, ZK185, ZK204, T29, or CNN145; and the irradiating wavelength is in the 660-700 nm range.

46. The method according to Claim 38, wherein the imaging agent is ZK211, ZK172, MDL17, ZK198, ZK190, AL22, or AL20; and the irradiating wavelength is in the 760-800 nm, range.

47. A method for imaging white adipose tissue, the method comprising:

(a) contacting the white adipose tissue with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the white adipose tissue.

48. The method according to Claim 41, wherein the imaging agent is PS31, CMI26, E24, MHI86, ZK240, or ZK244; and the irradiating wavelength is in the 660-700 nm range.

49. The method according to Claim 41, wherein the imaging agent is AH34, PS37, or ZK197; and the irradiating wavelength is in the 760-800 nm range.

50. A method for imaging brown adipose tissue, the method comprising:

(a) contacting the brown adipose tissue with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the brown adipose tissue.

~~51. The method according to Claim 44, wherein the imaging agent is SP60, PS39, SP30, SP29, SP33, SP34, E39, E44, E51, E81, ES17, ZK27, ZK26, SP28, SP27, SP67, PS31, LO1, LO3, YY165, or YY187; and the irradiating wavelength is in the 660-700 nm range.~~

~~52. The method according to Claim 44, wherein the imaging agent is QBN1, or PS37; and the irradiating wavelength is in the 760-800 nm range.~~

~~53. A method for imaging ovarian cells, the method comprising:~~

~~(a) contacting the ovarian cells with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the cells at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the ovarian cells.~~

~~54. The method according to Claim 47, wherein the imaging agent is PS62 or E43;; and the irradiating wavelength is in the 660-700 nm range.~~

~~In another particular embodiment, the imaging agents of the invention for use in ovarian cells is AL27 or CNN5; and the irradiating wavelength is in the 760-800 nm range.~~

~~55. A method for imaging testicular cells, the method comprising:~~

~~(a) contacting the testicular cells with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the cells at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the testicular cells.~~

~~56. A method for imaging seminal vesicles, the method comprising:~~

(a) contacting the seminal vesicles with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the seminal vesicles.

57. The method according to Claim 50, wherein the imaging agent is CNN2, CNN4, ZK48, LN50, TG66, LN66, AL31, or AL30; and the irradiating wavelength is in the 660-700 nm range.

In another particular embodiment, the imaging agents of the invention for use in seminal vesicle cells is CNN4, CNN2, ZK48, LN50, TG66, LN66, AL31, or AL30 ; and the irradiating wavelength is in the 760-800 nm range.

58. A method for imaging prostate cells, the method comprising:

(a) contacting the prostate cells with an imaging agent according to any one of Claims 1-7;

(b) irradiating the cells at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the prostate cells.

59. The method according to Claim 52, wherein the imaging agent is wherein the imaging agent is PS62; and the irradiating wavelength is in the 660-700 nm range.

60. the method according to Claim 54, wherein the imaging agent is LN66 ; and the irradiating wavelength is in the 760-800 nm range.

61 The method according to claim 52, wherein the imaging agents is conjugated to a prostate-specific membrane antigen (PSMA) targeting ligand.

62. A method for imaging the pancreas, the method comprising:

(a) contacting the pancreas with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the pancreas.

63. The method according to Claim 54, wherein the imaging agent is T14, PS62, SRA94, SRA89, SP28, SP29, ESS61, or T27; and the irradiating wavelength is in the 660-700 nm range.

64. The method according to Claim 54, wherein the imaging agent is AL22, CNN145, Rh800, Ox750, WuA96, or Ox170; and the irradiating wavelength is in the 760-800 nm range.

65. A method for imaging spleen and accessory splenic tissue, the method comprising:

(a) contacting the spleen and accessory splenic tissue with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the spleen or accessory splenic tissue.

66. The method according to Claim 57, wherein the imaging agent is E24, E44, E37, E38, E39, E43, E50, E51, E78, PTN1, AL79, SP27, TG5, TP5, EAO42, PS31, SP34, TG115, MHI86, MHI96, or MHI97; and the irradiating wavelength is in the 660-700 nm range.

67. The method according to Claim 57, wherein the imaging agent is AL29, LS1, AH34, JM1, ZK166, ZK189, ZK197, ZK198, AL27, AL25, MDL16, ZK215, or ZK184; and the irradiating wavelength is in the 760-800 nm range.

~~68. A method for imaging the gallbladder, the method comprising:~~

~~(a) contacting the gallbladder with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the tissue at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the gallbladder.~~

~~69. The method according to Claim 60, wherein the imaging agent is PS62, SRA94, SRA89, AC2, ESS61, A106, YY261, SP67, P700H, CNN13, ZK140, or ZK14; and the irradiating wavelength is in the 660-760 nm range.~~

~~70. The method according to Claim 60, wherein the imaging agent is ZK198, ZK208, ZK166, WuA71, or P800H; and the irradiating wavelength is in the 760-800 nm range.~~

~~71. A method for imaging bile ducts, the method comprising:~~

~~(a) contacting the bile ducts with an imaging agent according to any one of Claims 1-7;~~

~~(b) irradiating the tissue at a wavelength absorbed by the imaging agent;~~

~~(c) and detecting a signal from the imaging agent, thereby imaging the bile duct cells.~~

~~72. The method according to Claim 63, wherein the imaging agent is A106, CNN13, ZK140, SRA89, WuA96, Ox170, Ox750, Ox4, ESS61, ZK14, CNN16, CNN145, MHI84, P700H, CNN12, or CNN14; and the irradiating wavelength is in the 660-700 nm range.~~

~~73. The method according to Claim 63, wherein the imaging agent is ZK198, ZK166, ZK208, P800H, MDL16, or WuA71; and the irradiating wavelength is in the 760-800 nm range.~~

74. A method for imaging Peyer's patches the method comprising:

(a) contacting Peyer's patches with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging Peyer's patches.

75. The method according to Claim 67, wherein the imaging agent is AL30; and the irradiating wavelength is in the 760-800 nm range.

76. A method for imaging brain grey matter, the method comprising:

(a) contacting brain grey matter with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging brain grey matter.

77. The method according to Claim 69, wherein the imaging agent is WuA96, or ZK104; and the irradiating wavelength is in the 660-700 nm range.

In another particular embodiment, the imaging agents of the invention for use in brain grey matter imaging agent is ZK189; and the irradiating wavelength is in the 760-800 nm range.

78. A method for imaging brain white matter, the method comprising:

(a) contacting brain white matter with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging brain white matter.

79. A method for imaging brain vasculature, the method comprising:

(a) contacting brain vasculature with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging brain vasculature.

80. The method according to Claim 72, wherein the imaging agent is ZK214 or ZK104; and the irradiating wavelength is in the 660-700 nm range.

81. A method for imaging choroid plexus, the method comprising:

(a) contacting the choroid plexus with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the choroid plexus.

82. The method according to Claim 74, wherein the imaging agent is SP28, ZK135, SP66, ZK195, SP29, SP30, SP33, SP49, SP51, ZK78, ZK134, ZK135, ZK143, ZK140, ZK26, ZK78, ZK79, ZK133, ZK23, ZK101, SP66, SP72, MHI84, T14, T18, T20, or T23; and the irradiating wavelength is in the 660-700 nm range.

83. The method according to Claim 74, wherein the imaging agent is ZK208, ZK185, AL22, ZK172, MDL16, ZK211, ZK153, ZK155, or ZK169; and the irradiating wavelength is in the 760-800 nm range.

84. A method for imaging cerebrospinal fluid, the method comprising:

(a) contacting the cerebrospinal fluid with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the cerebrospinal fluid.

85. The method according to Claim 77, wherein the imaging agent is SP66, SP43, SP72, SP28, MHI84, YY161, or YY163; and the irradiating wavelength is in the 660-700 nm range.

In another particular embodiment, the imaging agents of the invention for use in CSF imaging agent is AL20, ZK189, or ZK208; and the irradiating wavelength is in the 760-800 nm range.

86. A method for imaging the pituitary gland, the method comprising:

(a) contacting the pituitary gland with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the pituitary gland.

87. The method according to Claim 79, wherein the imaging agent is SP60, SP64, SP28, SP29, SP30, SP33, SP34, SP43, SP51, SP53, ZK159, MHI84, YY187, SP59, SP67, ZK23, ZK204, ZK106, AL11, SP66, E79, E80, ES21, or LO3; and the irradiating wavelength is in the 660-700 nm range.

88. The method according to Claim 79, wherein the imaging agent is AL22, ZK185, ZK208, ZK172, ZK190, QBN1, QBN14, ZK153, ZK156, AL25, AL29, AL20, MDL17, or MDL16; and the irradiating wavelength is in the 760-800 nm range.

89. Amethod for imaging the thoracic duct, the method comprising:

(a) contacting the thoracic duct with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the thoracic duct.

90. The method according to Claim 82, wherein the imaging agent is LN15, A104, or TG42; and the irradiating wavelength is in the 660-700 nm range.

84. The method according to Claim 82, wherein the imaging agent is A71, ZW800-1, or WuA71; and the irradiating wavelength is in the 760-800 nm range.

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91. A method for imaging lymph nodes anywhere in the body (pan-lymph node), the method comprising:

(a) contacting the lymph nodes with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the lymph nodes.

92. The method according to Claim 85, wherein the imaging agent is A150, A146, A149, A148, A160, A161, A20, SP27, SP43, SP117, ZK197, ZK134, ZK46, ZK101, AL11, AL12, EAO42, ZK148, E16, E50, E51, E77, E78, E58, E59, E60, E70, E72, LO1, LO2, PTN11, ZK143, ZK140, ZK29, WuA108, MHI86, MHI96, or MHI97; and the irradiating wavelength is in the 660-700 nm range.

93. The method according to Claim 85, wherein the imaging agent is MM25, A64, AL30, AL33, PTN6, AH34, CNN10, MM21, CNN5, A71, MDL16, ZK172, LN63, ZK154, or ZK155; and the irradiating wavelength is in the 760-800 nm range.

94. Amethod for imaging the sentinel lymph node, the method comprising:

(a) contacting the sentinel lymph node with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the sentinel lymph node.

95. The method according to Claim 88, wherein the imaging agent is MHI86, MHI96, MHI97, A150, A146, A149, A148, A160, A161, A20, E37, or E78; and the irradiating wavelength is in the 660-760 nm range.

96. The method according to Claim 88, wherein the imaging agent is MM25, A64, AL30, or AL33; and the irradiating wavelength is in the 760-800 nm range.

97. A method for imaging vulnerable plaque, the method comprising:

(a) contacting the vulnerable plaque with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging vulnerable plaque.

98. A method for imaging stem cells, the method comprising:

(a) contacting the stem cells with an imaging agent according to any one of Claims 1-7;

(b) irradiating the cells at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the stem cells.

In certain embodiments, the compounds of the invention for use in stem cells have primary or secondary amines as part of their structure, which permit covalent fixation in place after treatment with paraformaldehyde (Mannich reaction) or other amine-reactive fixatives.

99. The method according to Claim 92, wherein the imaging agent is PS127, PS129, PS131, PS133, CNN12, CNN13, CNN14, CNN16, CNN17, Ox4, Ox170, ZK126, ZK211, ZK214, or EAO40; and the irradiating wavelength is in the 660-760 nm range.

100. The method according to Claim 92, wherein the imaging agent is PS126, PS128, PS130, or PS132; and the irradiating wavelength is in the 760-800 nm range.

101. A method for imaging biodegradable tissue scaffolds, the method comprising:

(a) contacting the biodegradable tissue scaffold with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tissue at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the biodegradable tissue scaffold.

102. The method according to Claim 95, wherein the imaging agent is A71-NHS ester, MHI103, CNN12, CNN13, CNN14, CNN16, CNN17, Ox4, Ox170, ZK126, ZK211, ZK214, EAO40, E59, EAO42, PTN12, E72, E24, E27, E50, E51, E79, E80, E81, ES17, ES21, LO1, LO2, T17, T23, T25, A106, A148, A150, A161, or AC8; and the irradiating wavelength is in the 660-700 nm range.

103. The method according to Claim 95, wherein the imaging agent is LN15-NHS ester, LN68, LN50, CNN3, LN65, LN63, or ZK166; and the irradiating wavelength is in the 760-800 nm range.

In certain embodiments, the imaging agents of the invention are amine-containing or meso-brominated imaging agents which are conjugated to biodegradable scaffolds.

104. A method for imaging neuroendocrine tumors, the method comprising:

(a) contacting the neuroendocrine tumors with an imaging agent according to any one of Claims 1-7;

(b) irradiating the tumors at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the imaging agent, thereby imaging the neuroendocrine tumors.

105. The method according to Claim 98, wherein the imaging agent is ESS61, SRA89, SRA94, CNN145, MHI84, Ox4, Ox170, Ox750, WuA96, CNN16, CNN12, or CNN14; and the irradiating wavelength is in the 660-700 nm range.

106. The method according to Claim 53, wherein the imaging agent is AL20, AL22, AL33, or AL30; and the irradiating wavelength is in the 760-800 nm range.

107. A method for imaging a hydrophobic molecule in a biological system, the method comprising:

(a) conjugating an imaging agent of the invention to a hydrophobic molecule to form a conjugated agent molecule;

(b) contacting a subject biological system with the conjugated agent molecule;

(c) irradiating the conjugated agent molecule at a wavelength absorbed by the imaging agent;

(c) and detecting a signal from the conjugated agent molecule, thereby imaging the hydrophobic molecule.

108. The method according to Claim 98, wherein the imaging agent is L700-1A and L700-1C; and the irradiating wavelength is in the 660-700 nm range.

109. The method according to Claim 53, wherein the imaging agent is L800-1A and L800-1C; and the irradiating wavelength is in the 760-800 nm range.