CLAIMS

What is claimed:

1. A conjugate of formula I or a pharmaceutically acceptable salt thereof

   $POL_n – (L – A)_b$ I

   wherein:

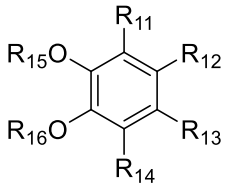
   POL is a water-soluble polymer;

   n represents the number of repeating units in the polymer and is 1-1000;

   b is 1 to 50, provided that n is always greater than or equal to b;

   L is a linkage comprising a first cleavable moiety, linking A and POL; and

   A is a compound comprising a catechol moiety, the catechol moiety comprising at least a first and a second phenolic hydroxyl group, wherein the compound is linked to the polymer via the first phenolic hydroxyl group and the second phenolic hydroxyl group is linked to a blocking group comprisin a second cleavable moiety.
2. The conjugate of claim 1, wherein the water-soluble polymer is a poly(oxazoline) polymer.
3. The conjugate of claim 1, wherein the water-soluble polymer is co-polymer, and wherein the co-polymer comprises 50% to 99.5% (by weight of the total polymer components) of a poly(oxazoline) polymer.
4. The conjugate of any one of claims 1-3, wherein the first cleavable moiety and the second cleavable moiety are each independently an ester, a carboxylate ester linkage (-C(O)-O-), a carbonate ester linkage (-O-C(O)-O-), a carbamate linkage (-O-C(O)-NH-), an amide linkage (-C(O)-NH-), or a disulfide linkage (S-S).
5. The conjugate of any one of claims 1-4, wherein the first cleavable moiety and the second cleavable moiety are the same.
6. The conjugate of any one of claims 1-5, wherein A is a compound of the formula III or a pharmaceutically acceptable salt thereof



III

   wherein:

   R_{11}, R_{12}, R_{13} and R_{14} are independently selected from H, OH, halogen, alkoxy, NO_2, unsubstituted alkyl, heteroalkyl, alkenyl, or alkynyl, substituted alkyl, heteroalkyl, alkenyl, or alkynyl, aryl, substituted aryl, cycloalkyl, substituted cycloalkyl,

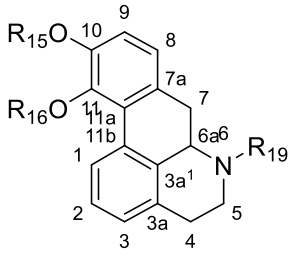
heterocyclyl, substituted heterocyclyl, heteroaryl, substituted heteroaryl, heterocyclylalkyl, substituted heterocyclylalkyl, heteroarylalkyl, substituted heteroarylalkyl, or any two of R_{11}, R_{12}, R_{13} and R_{14} that are adjacent to one another, taken together with the carbons to which they are attached, may form an optionally substituted aryl, heteroaryl, heterocyclyl ring; and

one of R_{15} or R_{16} is L; and

the other of R_{15} or R_{16} is the blocking group.

7. The conjugate of claim 6, wherein the compound is arbutamine, carbidopa, dobutamine, dopamine, entacapone, epinephrine, fenoldopam, isoetharine, isoproterenol, levopoda, levonordefrin, masaprocol, methyldopa, methyldopate, norepinephrine, protokylol, tolcapone, or (r)-(+)-fenoldopam.

8. The conjugate of any one of claims 1-5, wherein the compound is a compound of the formula IV or a pharmaceutically acceptable salt thereof



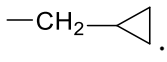
IV

wherein:

one of R_{15} or R_{16} is L;

the other of R_{15} or R_{16} is the blocking group; and

R_{19} is H, unsubstituted alkyl, alkenyl, or alkynyl, substituted alkyl, alkenyl, or alkynyl, benzyl, substituted benzyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, acyl, tetrahydrofuranyl, tetrahydropyranyl, nicotinyl or a 1-aryltetrazolyl.

9. The conjugate of claim 8, wherein R_{19} is selected from the group consisting of -H, -CH_3, -CH_2-CH_3, -CH_2-CH_2-CH_3, -$CH(CH_3)_2$ -CH_2-CH_2-CH_2-CH_3, and .

10. The conjugate of claims 6 or 9, wherein:

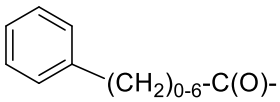
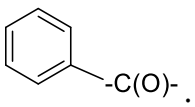
the blocking group is -R_{17}-R_{18};

R_{17} is -C(O)-, -C(O)-O-, -C(O)-NH-cyclic-O-C(O)-, -C(O)-NH-(C_6H_4)-O-C(O)-, $CH_3(CH_2)_{1\text{-}4}$-O-C(O)-$(CH_2)_{1\text{-}4}$-C(O)- or -O-P(O)(OR_9)(O)-;

cyclic represents substituted or unsubstituted aryl, heterocylalkyl, heteroaryl, heterocyclyl or cycloalkyl;

R_9 is H or a substituted or unsubstituted C1-C5 alkyl; and

R_{18} is an unsubstituted or substituted alkyl, an unsubstituted or substituted alkenyl, an unsubstituted or substituted aralkyl or an unsubstituted or substituted aryl group.

11. The conjugate of claim 10, wherein R_{17} forms a bond with the oxygen of the second phenolic hydroxyl group and R_{17} and the O to which it is linked forms the second cleavable moiety.
12. The conjugate of claim 11, wherein the second cleavable moiety is –C(O)-O.
13. The conjugate of claims 6 and 8, wherein the blocking group has the structure $(CH_3)_y$-(CH_x)-$(CH_2)_{0\text{-}6}$-C(O)-, $(CH_3)_y$-(CH_x)-C(O)-, CH_3-$(CH_2)_{0\text{-}6}$-C(O)-, CH_3-$(CH_2)_{0\text{-}6}$-C(O)-$(CH_2)_{0\text{-}6}$-, wherein when y is 1, x is 2, when y is 2, x is 1, or when y is 3, x is 0.
14. The conjugate of claims 6 and 8, wherein the blocking group has the structure CH_3-C(O)-, CH_3-$(CH_2)_2$-C(O)-, CH_3-CH_2-C(O)-, $(CH_3)_2$-CH-C(O)-, $(CH_3)_3$-C-C(O)-, CH_3CH_2-O-C(O)-CH_2CH_2-C(O)-, , or .
15. The conjugate of claim 8, wherein the compound is apomorphine.
16. A conjugate of formula IIA or a pharmaceutically acceptable salt thereof



IIA

wherein:

R is an initiating group;

POZ is a polyoxazoline polymer ;

n is 1-1000 and represents the number of monomer units comprising the polyoxazoline polymer;

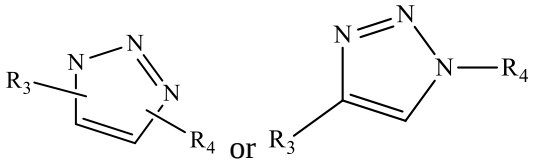
L is a linkage comprising a first cleavable moiety, linking A and the polyoxazoline polymer;

A is a compound comprising a catechol moiety, the catechol moiety comprising at least a first and a second phenolic hydroxyl group, wherein the compound is linked to the polymer via the first phenolic hydroxyl group and the second phenolic hydroxyl group is linked to a blocking group comprising a second cleavable moiety;

b is 1 to 50 and less than or equal to n; and

T is a terminating group.

17. The conjugate of claim 16, wherein L is a direct linkage or a linking group.

18. The conjugate of any one of claims 17, wherein L is a linking group having the structure  or , wherein

R_3 is a linker linking the triazole moiety to the polyoxazoline polymer; and

R_4 is a linker linking the triazole moiety to A, wherein the linker forms a bond with the first phenolic hydroxyl of A.

19. The conjugate of claim 18, wherein:

R_3 is -C(O)-R_5-,

R_5 is absent or is an unsubstituted or substituted alkyl, an unsubstituted or substituted alkenyl, an unsubstituted or substituted aralkyl or an unsubstituted or substituted heterocyclylalkyl group;

R_4 is -R_6-R_7-R_8-,

R_6 is a substituted or unsubstituted alkyl, substituted or unsubstituted aralkyl or a oligo(ethylene oxide);

R_7 is -R_a-C(O)-R_b-, -R_a-O-C(O)-R_b-, -R_a-C(O)-O-R_b, -R_a-C(O)-NH-cyclic-O-C(O)-R_b-, -R_a-C(O)-NH-(C_6H_4)-O-C(O)-R_b-, -R_a-O-C(O)-NR_{10}-R_b-, -R_a-CH(OH)-O-R_b-, –R_a-S-S-R_b-, –R_a-O-P(O)(OR_{10})-O-R_b-, or -R_a-C(O)-NR_{10}-R_b-;

cyclic represents substituted or unsubstituted aryl, heterocylalkyl, heteroaryl, heterocyclyl or cycloalkyl;

R_8 is absent or O;

R_{10} is H or a substituted or unsubstituted C1-C5 alkyl;

R_a and R_b are each independently absent or substituted or unsubstituted alkyl; and

wherein R_7 contains at least a portion of the first cleavable moiety.

20. The conjugate of any one of claims 16-17 and 19, wherein T is Z-B-Q, Z is S, O, or N, B is an optional linking group, and Q is a terminating nucleophile or a portion of a terminating nucleophile.