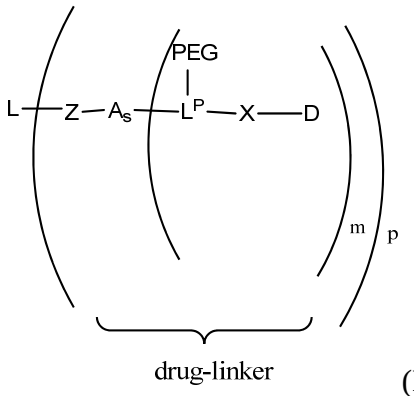
WHAT IS CLAIMED IS

1. A Ligand-Drug Conjugate compound wherein the Ligand-Drug Conjugate compound is represented by the structure of Formula I:



(I)

or a pharmaceutically acceptable salt thereof, wherein subscript s is 0 and subscript m is 1, or subscript s is 1 and subscript m is 2, 3 or 4;

L is a Ligand Unit;

D is a Drug Unit;

PEG is a Polyethylene Glycol Unit;

Z is a Stretcher Unit;

X is a Releasable Assembly Unit;

L^P is a Parallel Connector Unit;

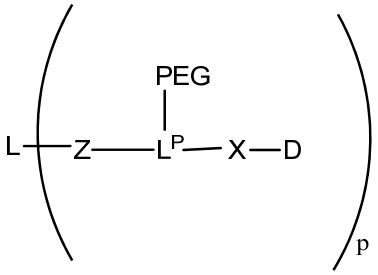
A is an optional Branching Unit;

AD is a Drug Attachment Unit;

subscript p is an integer ranging from 1 to 14, 2 to 12, 6 to 14, 6 to 12, 8 to 14 or 8 to 12;

wherein the Polyethylene Glycol Unit in parallel orientation relative to the Drug Units of

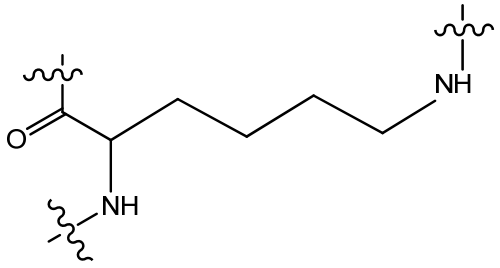
2. The Ligand-Drug Conjugate compound of claim 1, wherein the Ligand-Drug Conjugate compound has the structure represented by formula Ib:



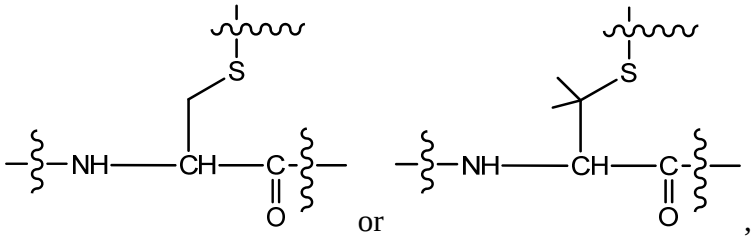
Ib

or a pharmaceutically acceptable salt thereof, wherein the Parallel Connector Unit (L^P) comprises an amino acid, an amino alcohol, an amino aldehyde or a polyamine.

3. The Ligand-Drug Conjugate compound of claim 2 wherein each Parallel Connector (L^P) Unit has the structure of:



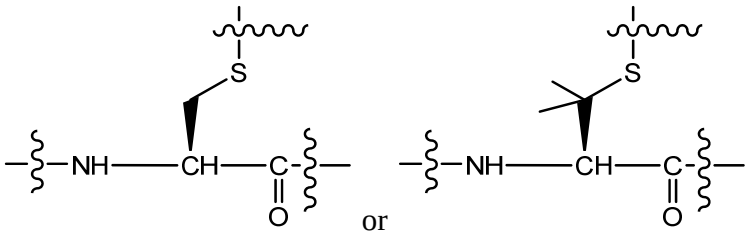
,



,

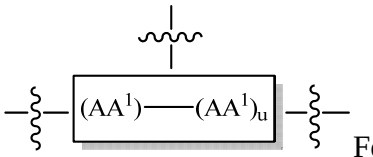
wherein the wavy lines indicates covalent attachment sites of L^P within the Ligand-Drug Conjugate compound.

4. The Ligand-Drug Conjugate compound of claim 3 wherein the Ligand Drug the Parallel Connector (L^P) Unit has the structure of



wherein the wavy line adjacent to the sulfur atom indicates covalent attachment to a Releasable Assembly Unit.

5. The Ligand-Drug Conjugate compound of claim 2 wherein the structure of the Parallel Connector (L^p) Unit is represented by Formula A:



Formula A

wherein

AA^1 of each Parallel Connector Unit (L^p) is independently selected from an amino acid, optionally substituted C_{1-20} heteroalkylene, optionally substituted C_{3-8} heterocyclo, optionally substituted C_{6-14} arylene, or optionally substituted C_3-C_8 carbocyclo; and

subscript u is an integer ranging from 0 to 4; wherein at least one AA^1 of each L^p Unit has a functionalized side chain that provides for an attachment site to a PEG, AD, A or Z unit or an X-D moiety, or

AA^1 of each Parallel Connector Unit (L^p) is an independently selected amino acid or is an optionally substituted C_{1-20} heteroalkylene, optionally substituted C_{3-8} heterocyclo, optionally substituted C_{6-14} arylene, or optionally substituted C_3-C_8 carbocyclo, provided that no more than 2 of AA^1 is an optionally substituted C_{1-20} heteroalkylene, optionally substituted C_{3-8} heterocyclo, optionally substituted C_{6-14} arylene, or optionally substituted C_3-C_8 carbocyclo;

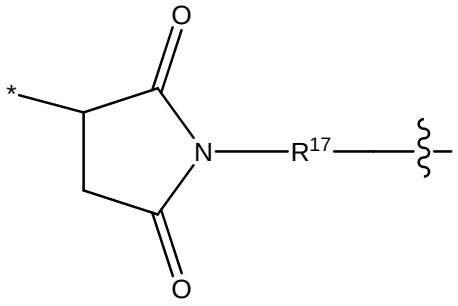
and

each optional Branching Unit (A), when present, is one to 10 independently selected amino acids, amino alcohols or amino aldehydes or polyamines, or a combination thereof, covalently bonded to one another; and

each Drug Attachment Unit (AD), when present, is one to 10 independently selected amino acids or amino alcohols or amino aldehydes or polyamines, or a combination thereof, covalently bonded to one another,

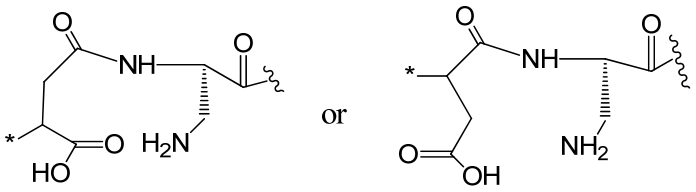
wherein the wavy lines indicates the covalent attachment sites of L^p within the Ligand-Drug Conjugate compound.

6. The Ligand-Drug Conjugate compound of claim 2 wherein Z has the structure of



wherein R^{17} is -$(CH_2)_5C(=O)$-, the asterisk indicates covalent attachment of each Z to the Ligand Unit and the wavy line indicates covalent attachment of each Z to the remainder of a Linker-Drug moiety within the Ligand-Drug Conjugate compound.

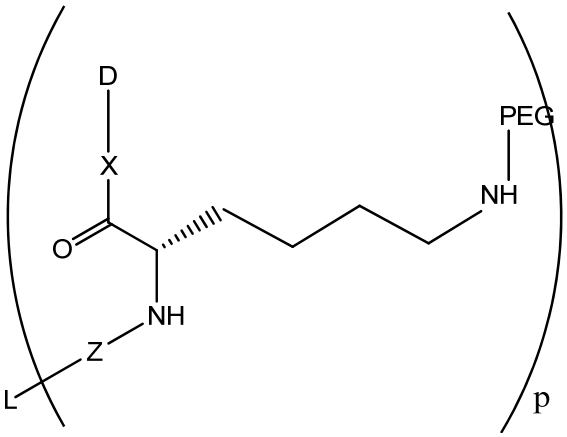
7. The Ligand-Drug Conjugate compound of claim 2 wherein Z has the structure of



wherein the asterisk indicates attachment of each Z to the Ligand Unit and the wavy line indicates covalent attachment of each Z to the remainder of a Linker-Drug moiety within the Ligand-Drug Conjugate compound.

8. The Ligand-Drug Conjugate compound of claim 2 wherein subscript p is an integer ranging from 6 to 14.

9. The Ligand-Drug Conjugate compound of claim 1 wherein the Ligand-Drug Conjugate compound is represented by the structure of:

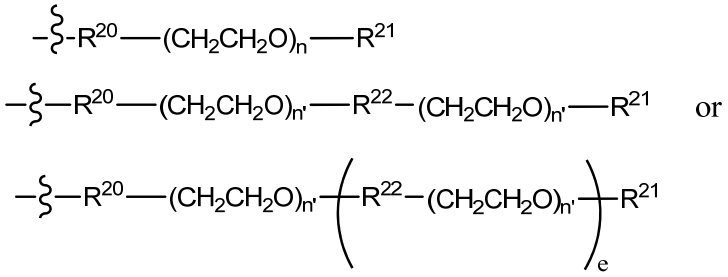


or a pharmaceutically acceptable salt thereof.

10. The Ligand-Drug Conjugate compound of claim 9 wherein the Polyethylene Glycol Unit (PEG) comprises no more than about 72 (OCH_2CH_2) subunits, or no more than about 36 (OCH_2CH_2) subunits.

11. The Ligand-Drug Conjugate compound of claim 9, wherein the Polyethylene Glycol Unit (PEG) comprises one or more linear polyethylene glycol chains having a combined total of 8 to 72, 8 to 60, 8 to 48, 8 to 36 or 8 to 24 (OCH_2CH_2) subunits, a combined total of 10 to 72, 10 to 60, 10 to 48, 10 to 36 or 10 to 24 (OCH_2CH_2) subunits, or a combined total of 12 to 72, 12 to 60, 12 to 48, 12 to 36 or 12 to 24 (OCH_2CH_2) subunits.

12. The Ligand-Drug Conjugate compound of claim 9 wherein the Polyethylene Glycol Unit (PEG) has the structure of:



wherein the wavy line indicates site of attachment of the Polyethylene Glycol Unit (PEG) to the Parallel Connector Unit;

R^{20} is a PEG Attachment Unit;

R^{21} is a PEG Capping Unit;

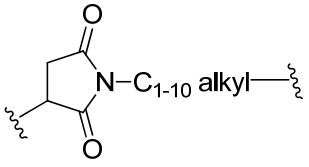
R^{22} is a PEG Coupling Unit;

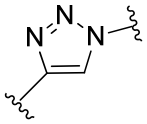
subscript n independently ranges from 4 to 72, 6 to 72, 8 to 72, 10 to 72 or 12 to 72;

subscript e independently ranges from 2 to 5; and

each subscript n' independently ranges from 1 to 72, provided that there are at least 4, at least 6, at least 8, at least 10, or at least 12 polyethylene glycol (OCH_2CH_2) subunits in the Polyethylene Glycol Unit.

13. The Ligand-Drug Conjugate compound of claim 12 wherein

R^{20} is –C(O)-, -O-, -S-, -S(O)-, -NH-, -C(O)O-, -C(O)C_{1-10}alkyl, -C(O)C_{1-10}alkyl-O-, -C(O)C_{1-10}alkyl-CO_2-, -C(O)C_{1-10}alkyl-NH-, -C(O)C_{1-10}alkyl-S-, -C(O)C_{1-10}alkyl-C(O)-NH-, -C(O)C_{1-10}alkyl-NH-C(O)-, -C_{1-10}alkyl, -C_{1-10}alkyl-O-, -C_{1-10}alkyl-CO_2-, -C_{1-10}alkyl-NH-, -C_{1-10}alkyl-S-, -C_{1-10}alkyl-C(O)-NH-, -C_{1-10}alkyl-NH-C(O)-, -$CH_2CH_2SO_2$-C_{1-10}alkyl-, -CH_2C(O)-C_{1-10} alkyl-, =N-(O or N)-C_{1-10}alkyl-O-, =N-(O or N)-C_{1-10}alkyl-NH-, =N-(O or N)-C_{1-10}alkyl-CO_2-, =N-(O or N)-C_{1-10}alkyl-S-, 

, or 

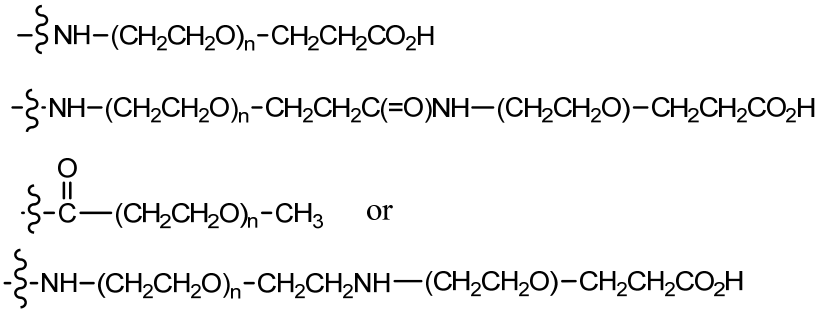
, or R^{20} is -NH- or -C(O)-;

and

each R^{21} is independently selected from the group consisting of -C_{1-10} alkyl, -C_{2-10} alkyl-CO_2H, -C_{2-10} alkyl-OH, -C_{2-10} alkyl-NH_2, C_{2-10} alkyl-NH(C_{1-3} alkyl), and C_{2-10} alkyl-N(C_{1-3} alkyl)$_2$; and

each R^{22} is independently selected from the group consisting of -C_{1-10} alkyl-C(O)-NH-, -C_{1-10} alkyl-NH-C(O)-, -C_{2-10} alkyl-NH-, -C_{2-10} alkyl-O-, -C_{1-10} alkyl-S-, and –C_{2-10} alkyl-NH-.

14. The Ligand-Drug Conjugate compound of claim 12 wherein the Polyethylene Glycol Unit (PEG) has the structure of:



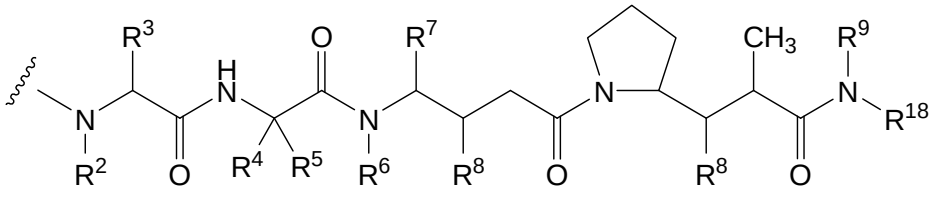
wherein the wavy line indicates site of attachment to the Parallel Connector Unit, and each subscript n is independently an integer ranging from 4 to 72, or each subscript n is independently an integer ranging from 6 to 24, or from 8 to 24.

15. The Ligand-Drug Conjugate compound of claim 12 wherein the Polyethylene Glycol Unit (PEG) has at least 6 $–CH_2CH_2O-$ subunits and no more than 72 $–CH_2CH_2O-$ subunits, or has at least 8 $-CH_2CH_2O-$ subunits and no more than 36 $-CH_2CH_2O-$ subunits.

16. The Ligand-Drug Conjugate compound of claim 15 wherein the Drug Unit is hydrophobic or is that of a drug having a SlogP value of 2.5 or greater.

17. The Ligand-Drug Conjugate compound of claim 16 wherein the Drug Unit is an auristatin.

18. The Ligand-Drug Conjugate compound of claim 17 wherein the auristatin Drug Unit is represented by the structure of formula D_E:



D_E

wherein, independently at each location:

R^2 is selected from the group consisting of H and C_1-C_8 alkyl;

R^3 is selected from the group consisting of H, C_1-C_8 alkyl, C_3-C_8 carbocycle, aryl, C_1-C_8 alkyl-aryl, C_1-C_8 alkyl-(C_3-C_8 carbocycle), C_3-C_8 heterocycle and C_1-C_8 alkyl-(C_3-C_8 heterocycle);

R^4 is selected from the group consisting of H, C_1-C_8 alkyl, C_3-C_8 carbocycle, aryl, C_1-C_8 alkyl-aryl, C_1-C_8 alkyl-(C_3-C_8 carbocycle), C_3-C_8 heterocycle and C_1-C_8 alkyl-(C_3-C_8 heterocycle);

R^5 is selected from the group consisting of H and methyl;

or R^4 and R^5 jointly form a carbocyclic ring and have the formula $-(CR^aR^b)_n-$ wherein R^a and R^b are independently selected from the group consisting of H, C_1-C_8 alkyl and C_3-C_8 carbocycle and n is selected from the group consisting of 2, 3, 4, 5 and 6;

R^6 is selected from the group consisting of H and C_1-C_8 alkyl;

R^7 is selected from the group consisting of H, C_1-C_8 alkyl, C_3-C_8 carbocycle, aryl, C_1-C_8 alkyl-aryl, C_1-C_8 alkyl-(C_3-C_8 carbocycle), C_3-C_8 heterocycle and C_1-C_8 alkyl-(C_3-C_8 heterocycle);

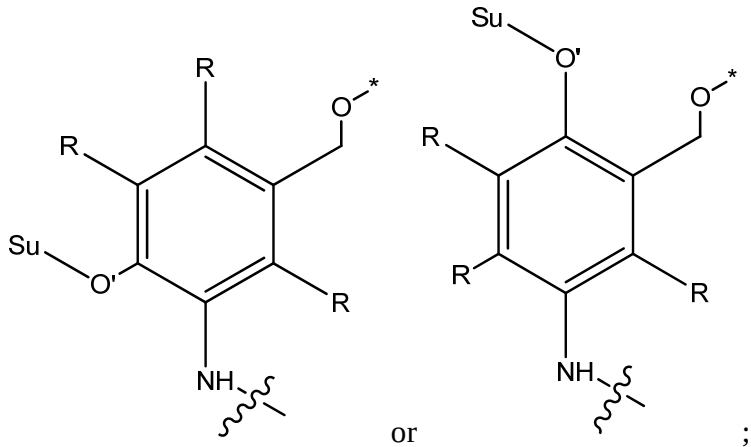
each R^8 is independently selected from the group consisting of H, OH, C_1-C_8 alkyl, C_3-C_8 carbocycle and O-(C_1-C_8 alkyl);

R^9 is selected from the group consisting of H and C_1-C_8 alkyl; and

R^{18} is selected from the group consisting of $-C(R^8)_2-C(R^8)_2-$aryl, $-C(R^8)_2-C(R^8)_2-(C_3$-C_8 heterocycle), and $-C(R^8)_2-C(R^8)_2-(C_3$-C_8 carbocycle).

19. The Ligand-Drug Conjugate compound of claim 1 wherein the Releasable Assembly Unit comprises a sugar moiety linked to a self-immolative group via a glycosidic bond to which the Drug Unit is bonded so that cleavage of the glycosidic bond by a glycosidase at the site targeted by the Ligand Unit results in release of free drug from the Ligand-Drug Conjugate compound.

20. The Ligand-Drug Conjugate compound of claim 19 wherein the Releasable Assembly Unit comprises a glucuronide unit represented by the formula:



or ;

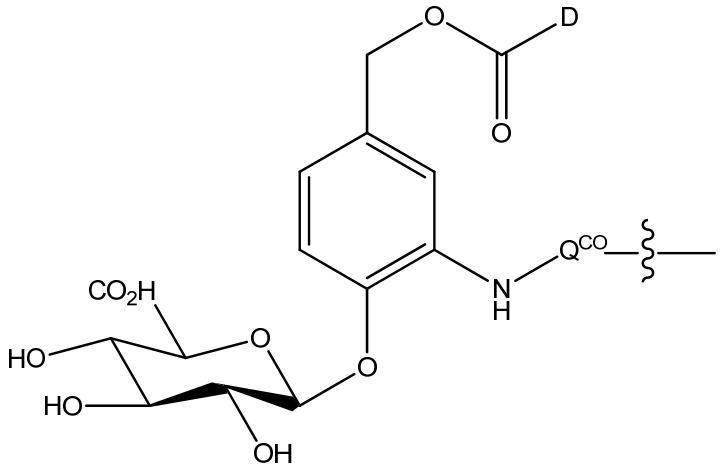
wherein Su is the sugar moiety, -O'- represents an oxygen atom of a glycosidic bond;

each R is independently selected from the group consisting of hydrogen, a halogen, -CN, and -NO_2; and wherein the wavy line indicates attachment of the self-immolative group to L^P, AD or A, (either directly or indirectly through a Covalent Attachment Unit); and

the asterisk indicates attachment of the self-immolative group to the Drug Unit (either directly or indirectly via a Spacer Unit).

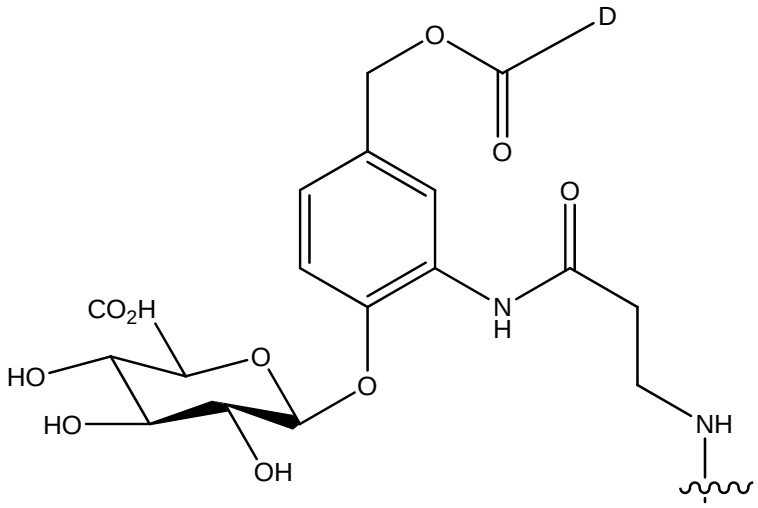
21. The Ligand-Drug Conjugate compound of claim 1 wherein the Releasable Assembly Unit comprises a peptide cleavable by cathepsin B.

22. The Ligand-Drug Conjugate compound of claim 19 wherein –X-D has the structure of:



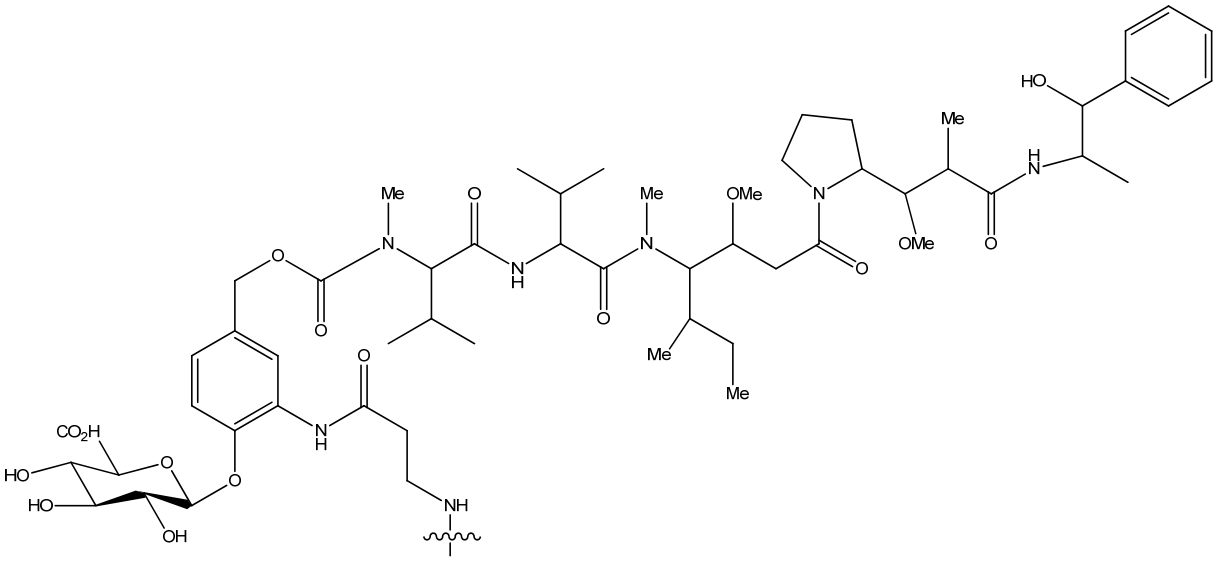
wherein Q^{CO} is an optional Covalent Attachment Unit and the wavy line indicates covalent attachment to the remainder of a Drug Linker moiety of the Ligand-Drug Conjugate compound.

23. The Ligand-Drug Conjugate compound of claim 22 wherein –X-D has the structure of:

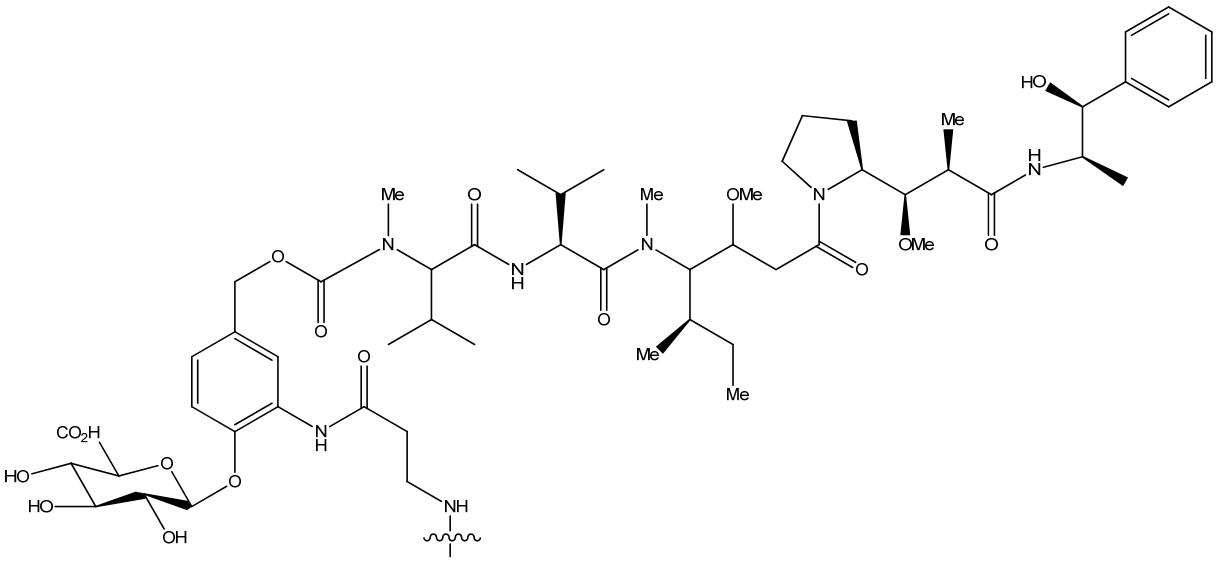


wherein the wavy line indicates covalent to the remainder of a Drug Linker moiety of the Ligand-Drug Conjugate compound.

24. The Ligand-Drug Conjugate compound of any one of claim 23 wherein –X-D has the structure of:



or



wherein the wavy line indicates covalent attachment to the to the remainder of a Drug Linker moiety of the Ligand-Drug Conjugate compound.

25. The Ligand-Drug Conjugate compound of claim 1 wherein the Ligand Unit is a monoclonal antibody.

26. The Ligand-Drug Conjugate compound of claim 1 wherein the Ligand Unit is an antibody and the antibody is conjugated to each Stretcher Unit (Z) via a sulfur atom of a cysteine residue of the antibody.

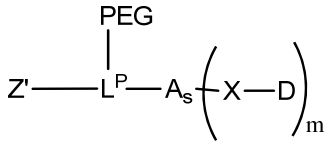
27. The Ligand-Drug Conjugate compound of claim 26 wherein the cysteine residue is naturally occurring and is from an interchain disulfide of the antibody or the cysteine residue is non-naturally occurring and is from a cysteine introduced into the antibody.

28. The Ligand-Drug Conjugate compound of claim 27 wherein subscript p is 8, and the antibody is conjugated to Stretcher Units (Z) through the sulfur atoms of the interchain disulfides of the antibody, or subscript p is an integer ranging from 10 to 14 or 10 to 12, and the antibody is conjugated to the Stretcher Units through sulfur atoms from the interchain disulfides of the antibody and cysteine residues introduced into the antibody.

29. The Ligand-Drug Conjugate compound of claim 28 wherein the cysteine residue is at position 239 according to the EU index.

30. A pharmaceutical composition comprising a population of Ligand-Drug Conjugate compounds of claim 1 wherein the average number of drug-linker moieties per Ligand Unit in the composition ranges from about 4 to about 14, from about 6 to about 14, from about 8 to about 14, or from about 8 to about 12, or the average number of molecules of Linker-Drug moieties per Ligand Unit in the composition is about 8; and a pharmaceutically acceptable carrier.

31. A Drug-Linker Compound wherein the Drug-Linker compound is represented by the structure of formula IV:



(IV)

or a pharmaceutically acceptable salt thereof, wherein

D is a Drug Unit;

PEG is a Polyethylene Glycol Unit;

Z' is a Stretcher Unit capable of forming a covalent attachment to a Ligand Unit;

X is a Releasable Assembly Unit;

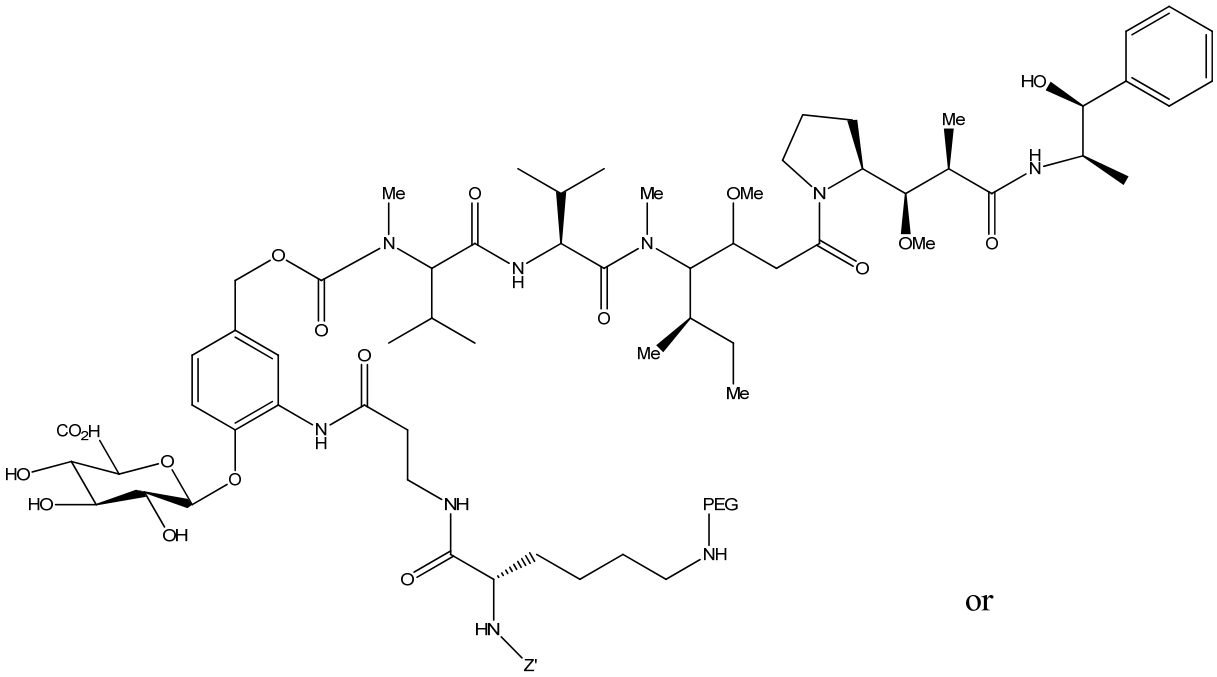
L^P is a Parallel Connector Unit;

A is an optional Branching Unit;

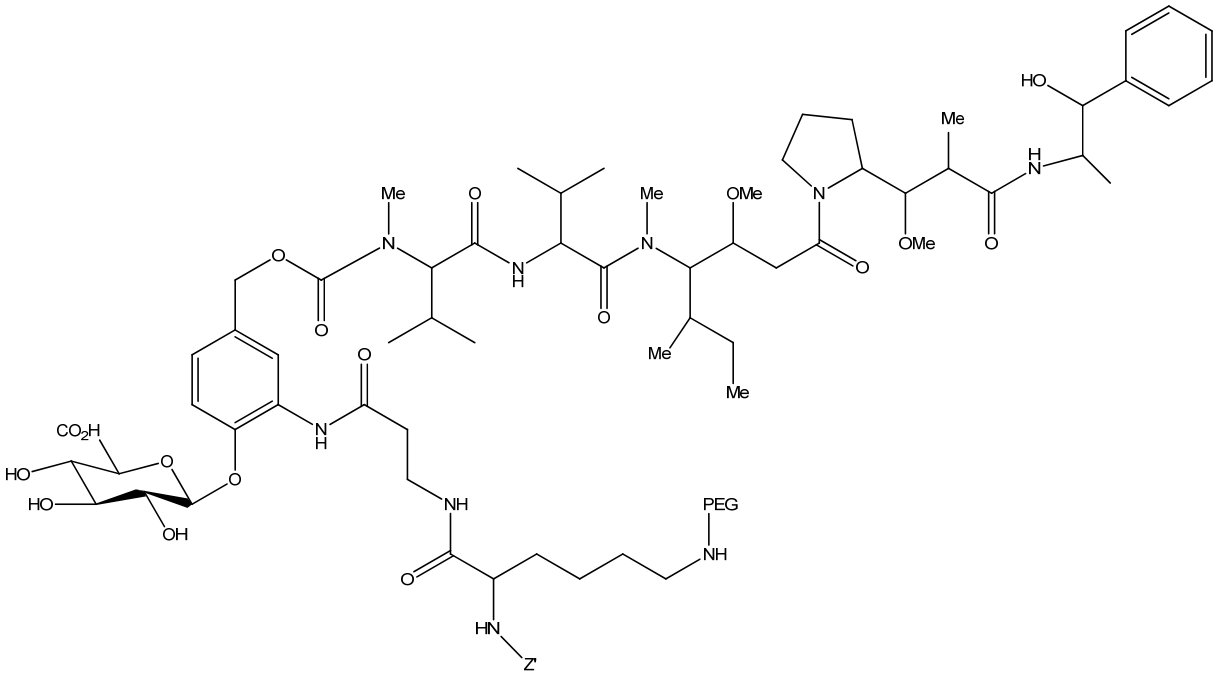
subscript m is an integer ranging from 1 to 4, or is 1 or 2; and

subscript s is 0 or 1,with the proviso that when subscript s is 0, subscript m is 1 and when subscript s is 1, subscript m is 2, 3 or 4.

32. The Drug-Linker Compound of claim 31 wherein the Drug-Linker Compound has the structure of:

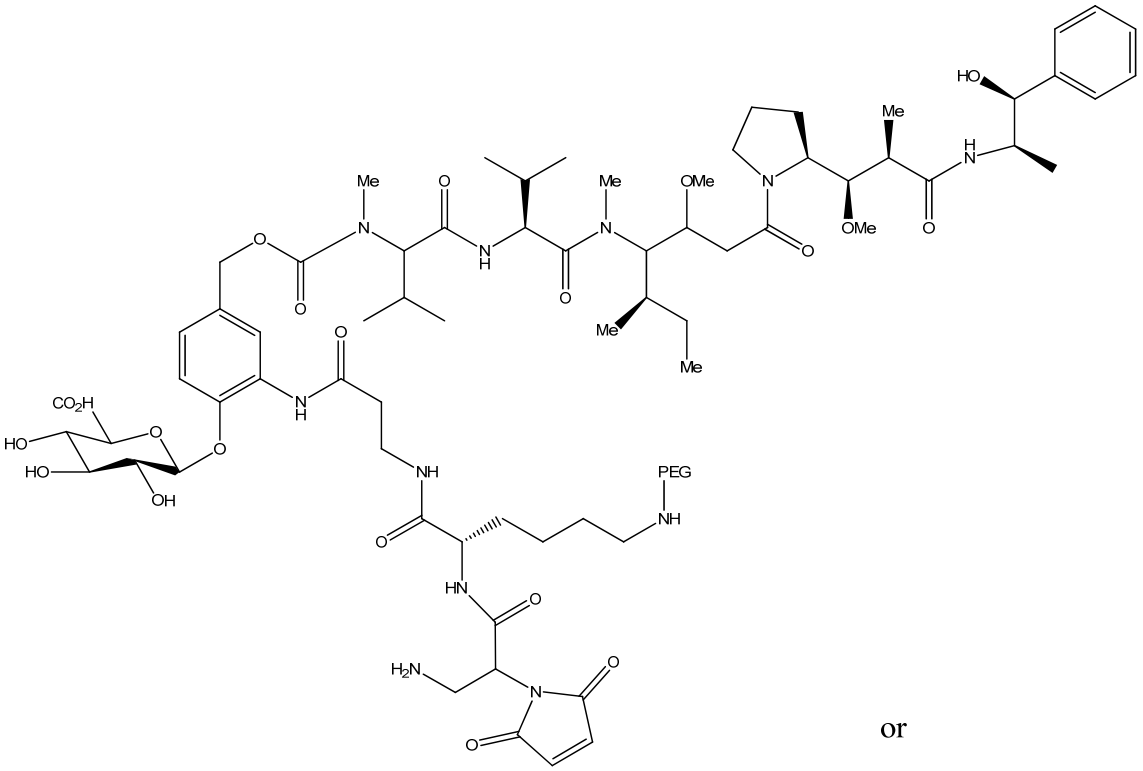


or

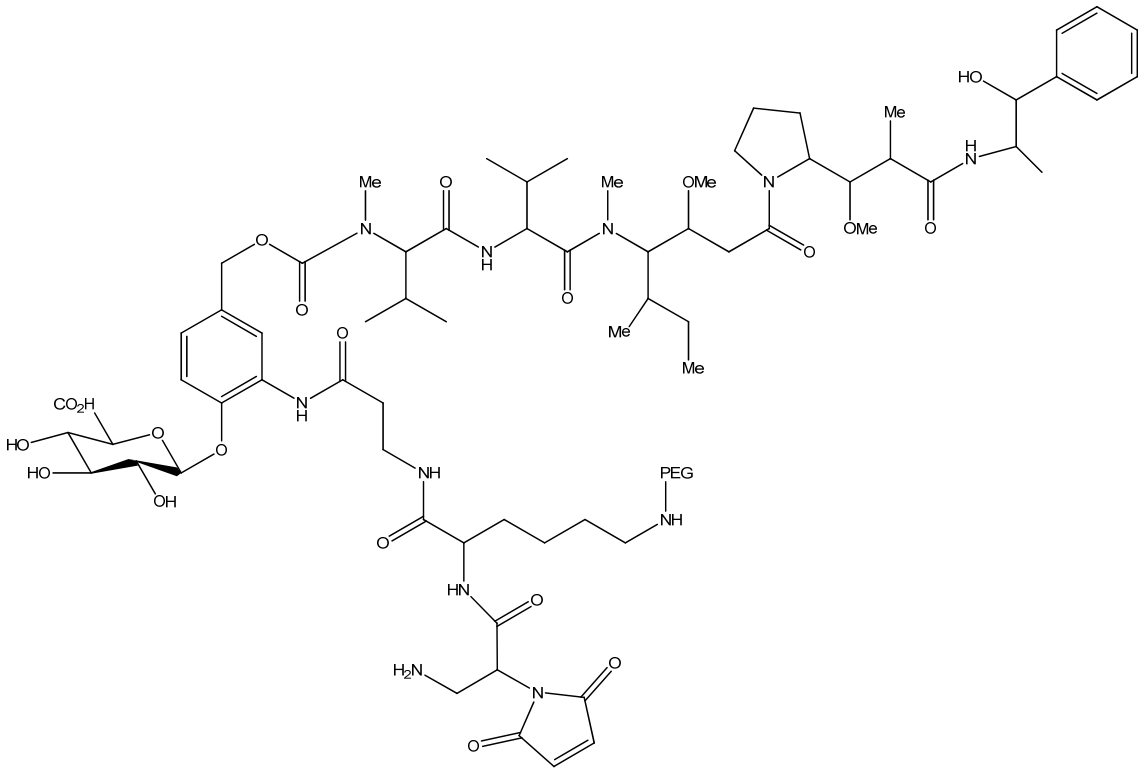


or a pharmaceutically acceptable salt thereof.

33. The Drug-Linker Compound of claim 31 wherein the Drug-Linker Compound has the structure of:

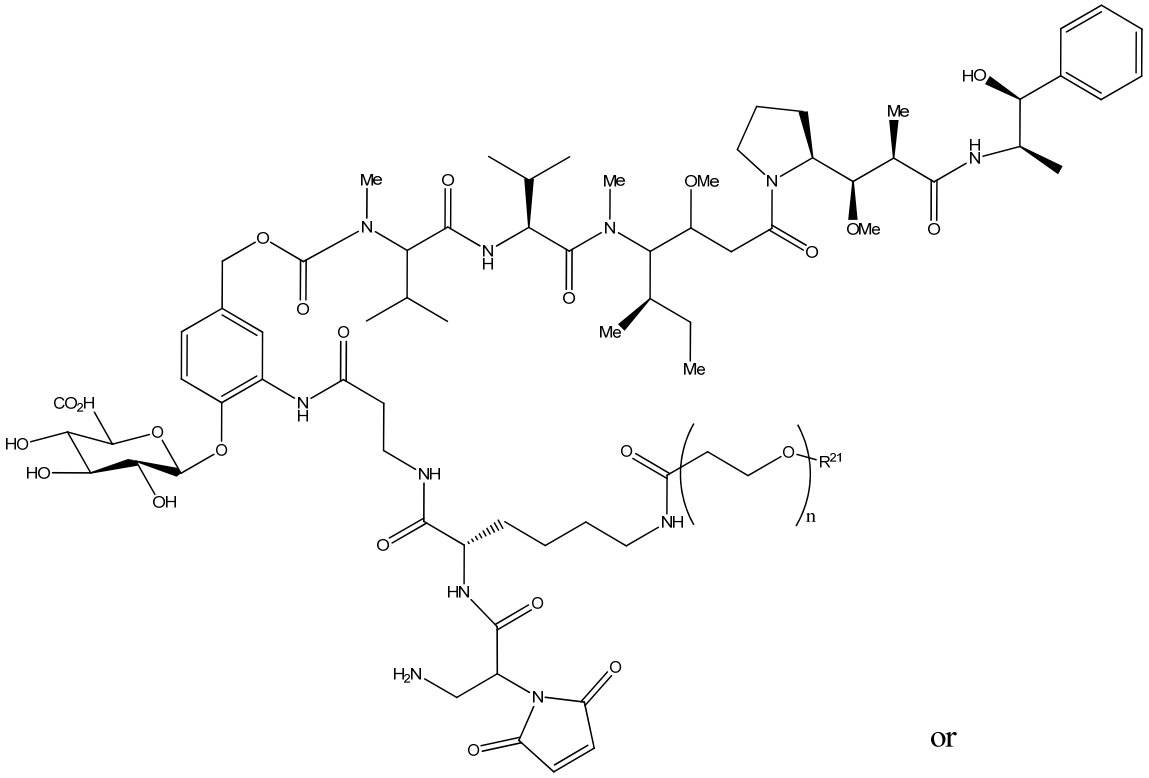


or

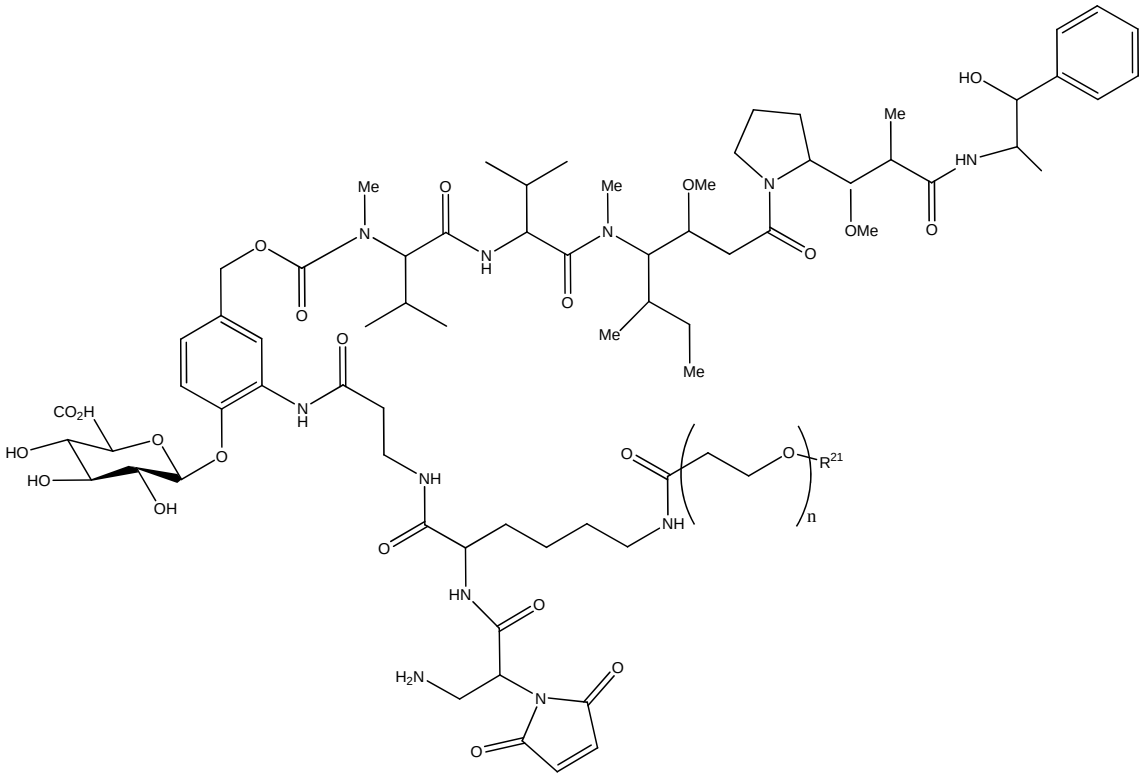


or a pharmaceutically acceptable salt thereof.

34. The Drug-Linker Compound of claim 31 wherein the Drug-Linker Compound has the structure of:

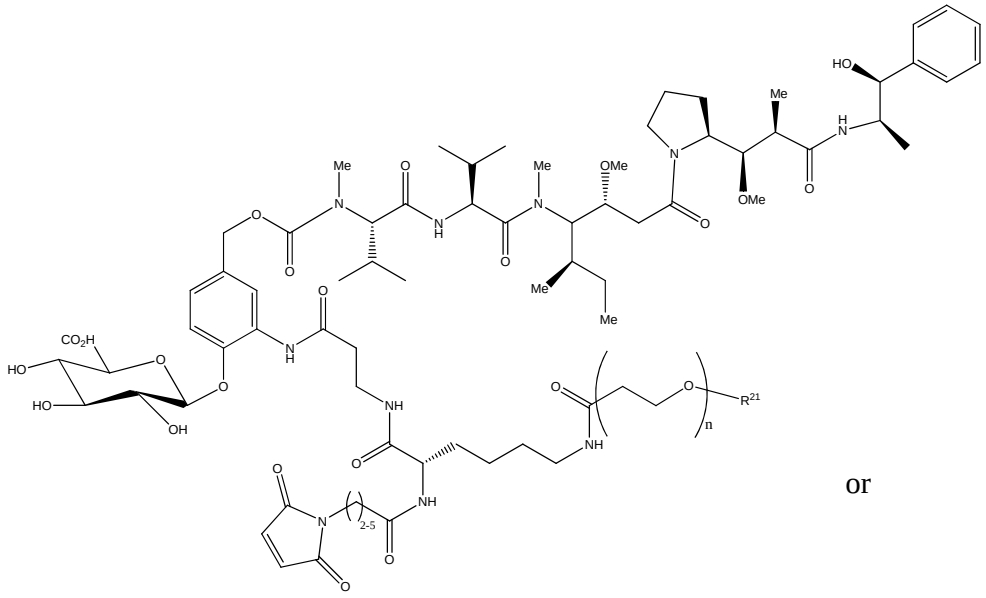


or

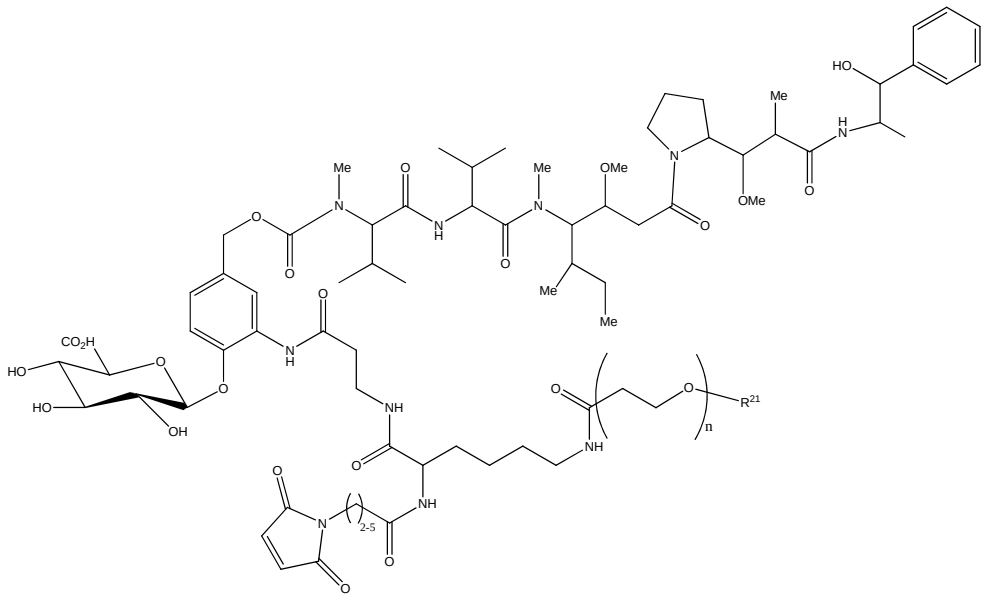


or a pharmaceutically acceptable salt thereof, wherein R^{21} is a PEG Capping Unit and n is an integer ranging from 6 to 72, 8 to 72, or 8 to 24, or subscript n is 8, 12, or 24 and R^{21} is a PEG Capping Unit, wherein the PEG Capping Unit is methyl, ethyl or propyl.

35. The Drug-Linker Compound of claim 31 wherein the Drug-Linker Compound has the structure of



or

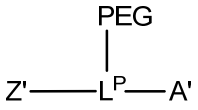


or a pharmaceutically acceptable salt thereof wherein R^{21} is a PEG Capping Unit and subscript n ranges from 6 to 72, from 8 to 72, or from 8 to 24, or subscript n is 8, 12, or 24 and R^{21} is a PEG Capping Unit, wherein the PEG Capping Unit is methyl, ethyl or propyl.

36. A pharmaceutical composition comprising a population of Ligand-Drug Conjugate compounds each having a Linker-Drug moiety corresponding in structure to a Drug-Linker compound of claim 31 conjugated to a Ligand Unit; and a pharmaceutically acceptable

carrier, wherein the average number of drug-linker moieties per Ligand Unit in the composition ranges from about 8 to about 14; and each parallel oriented PEG unit of a Ligand Drug Conjugate has at least 8 to no more than 24 PEG subunits, or has at least 12 to no more than 24 PEG subunits.

37. A Linker Compound having the formula VII:



(VII)

or a pharmaceutically acceptable salt thereof wherein

PEG is a Polyethylene Glycol Unit;

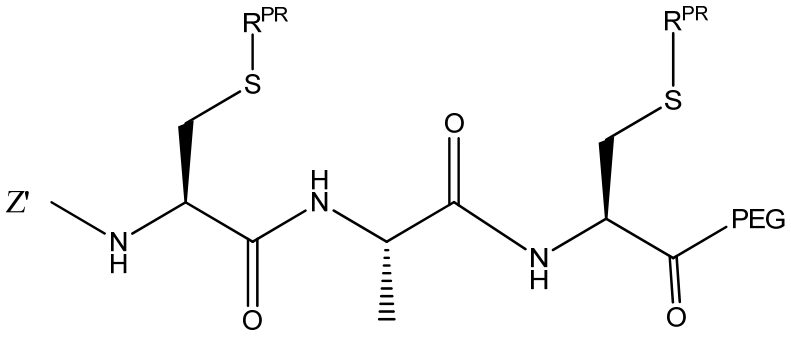
Z' is a Stretcher Unit capable of forming a covalent attachment to a Ligand Unit;

-X-D is a Releasable Assembly Unit attached to a Drug Unit;

A' is a Branching Unit capable of forming a covalent attachment to two to four X-D Units, or to two X-D moieties; and

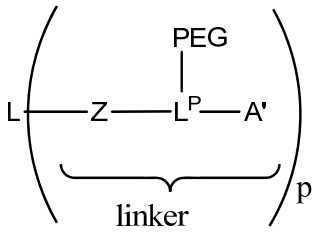
L^P is a Parallel Connector Unit.

38. The Linker Compound of claim 37 having the formula



or a pharmaceutically acceptable salt thereof, wherein R^{PR} is a thiol protecting group

39. A Ligand-Linker Compound having the formula X as follows:



(X)

or a pharmaceutically acceptable salt thereof wherein

L is a Ligand Unit;

PEG is a Polyethylene Glycol Unit;

Z- is a Stretcher Unit;

-X-D is a Releasable Assembly Unit attached to a Drug Unit;

L^P is a Parallel Connector Unit;

A' is a Branching Unit capable of forming a covalent attachment to two to four X-D moieties, or two X-D moieties; and

subscript p is an integer ranging from 1 to 14, or from about 2 to about 12, about 6 to about 14, about 6 to about 12, about 8 to about 14 or about 8 to about 12).

40. A method of treating cancer comprising administering to a subject in need thereof, an effective amount of a Ligand-Drug Conjugate compound of claim 1 wherein the Ligand Unit of the Ligand-Drug Conjugate specifically binds to a target antigen expressed by cancer cells.

41. The Ligand-Drug Conjugate of claim 1 wherein the Ligand Unit is a monoclonal antibody that specifically binds to CD19, CD20, CD30, CD33, CD70, alpha-v-beta-6, or Liv-1 antigen.

42. The Ligand-Drug Conjugate of claim 41 wherein the monoclonal antibody is a chimeric or humanized AC10 antibody.