CLAIMS

1. An antibody conjugate represented by Formula I or pharmaceutically acceptable salt thereof:

$$\mathbf{Ab\text{-}(X)_y}$$

Formula I

wherein:

Ab is an anti-CD19 antibody or antigen-binding fragment thereof, or a bispecific antibody comprising a first arm that binds CD19, wherein Ab comprises a variable heavy chain complementarity determining region 1 (CDRH1), a variable heavy chain complementarity determining region 2 (CDRH2), a variable heavy chain complementarity determining region 3 (CDRH3), a variable light chain complementarity determining region 1 (CDRL1), a variable light chain complementarity determining region 2 (CDRL2), and a variable light chain complementarity determining region 3 (CDRL3); wherein,

(a) (i) CDRH1 comprises the amino acid sequence of SEQ ID NO: 23;
(ii) CDRH2 comprises the amino acid sequence of SEQ ID NO: 24;
(iii) CDRH3 comprises the amino acid sequence of SEQ ID NO: 25;
(iv) CDRL1 comprises the amino acid sequence of SEQ ID NO: 32,
(v) CDRL2 comprises the amino acid sequence of SEQ ID NO: 33; and
(vi) CDRL3 comprises the amino acid sequence of SEQ ID NO: 34;

(b) (i) CDRH1 comprises the amino acid sequence of SEQ ID NO: 23;
(ii) CDRH2 comprises the amino acid sequence of SEQ ID NO: 24;
(iii) CDRH3 comprises the amino acid sequence of SEQ ID NO: 26;
(iv) CDRL1 comprises the amino acid sequence of SEQ ID NO: 32;
(v) CDRL2 comprises the amino acid sequence of SEQ ID NO: 33; and
(vi) CDRL3 comprises the amino acid sequence of SEQ ID NO: 35;

(c) (i) CDRH1 comprises the amino acid sequence of SEQ ID NO: 23;
(ii) CDRH2 comprises the amino acid sequence of SEQ ID NO: 24;
(iii) CDRH3 comprises the amino acid sequence of SEQ ID NO: 26;
(iv) CDRL1 comprises the amino acid sequence of SEQ ID NO: 32;
(v) CDRL2 comprises the amino acid sequence of SEQ ID NO: 33; and

(vi) CDRL3 comprises the amino acid sequence of SEQ ID NO: 36;

(d) (i) CDRH1 comprises the amino acid sequence of SEQ ID NO: 23;

(ii) CDRH2 comprises the amino acid sequence of SEQ ID NO: 24;

(iii) CDRH3 comprises the amino acid sequence of SEQ ID NO: 27;

(iv) CDRL1 comprises the amino acid sequence of SEQ ID NO: 37;

(v) CDRL2 comprises the amino acid sequence of SEQ ID NO: 38; and

(vi) CDRL3 comprises the amino acid sequence of SEQ ID NO: 40;

(e) (i) CDRH1 comprises the amino acid sequence of SEQ ID NO: 23;

(ii) CDRH2 comprises the amino acid sequence of SEQ ID NO: 24;

(iii) CDRH3 comprises the amino acid sequence of SEQ ID NO: 28;

(iv) CDRL1 comprises the amino acid sequence of SEQ ID NO: 41;

(v) CDRL2 comprises the amino acid sequence of SEQ ID NO: 42; and

(vi) CDRL3 comprises the amino acid sequence of SEQ ID NO: 43; or

(f) (i) CDRH1 comprises the amino acid sequence of SEQ ID NO: 29;

(ii) CDRH2 comprises the amino acid sequence of SEQ ID NO: 30;

(iii) CDRH3 comprises the amino acid sequence of SEQ ID NO: 31;

(iv) CDRL1 comprises the amino acid sequence of SEQ ID NO: 44;

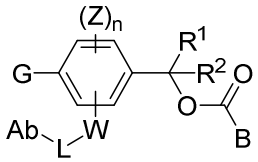
(v) CDRL2 comprises the amino acid sequence of SEQ ID NO: 45; and

(vi) CDRL3 comprises the amino acid sequence of SEQ ID NO: 46;

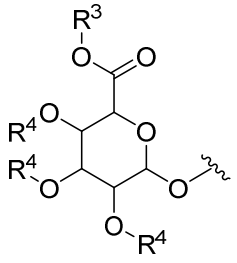
each X is, independently, a chemical moiety comprising one or more active agents and a linker, wherein the linker links Ab to the active agent(s); the linker is cleavable by enzyme-mediated hydrolysis;

y is an integer from 1 to 20;

wherein the antibody conjugate is represented by Formula II:



Formula II

G is a glucuronic acid moiety or , wherein R^3 is hydrogen or a carboxyl protecting group, and each R^4 is independently hydrogen or a hydroxyl protecting group;

B is an active agent;

R^1 and R^2 are each independently hydrogen, C_{1-8} alkyl, or C_{3-8} cycloalkyl; or

W is -C(O)-, -C(O)NR'-, -C(O)O-, -SO_2NR'-, -P(O)R''NR'-, -SONR'-, or -PO_2NR'-, wherein the C, S, or P is directly bound to the phenyl ring, and R' and R" are each independently hydrogen, C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{1-8} alkoxy, C_{1-8} alkylthio, mono- or di-C_{1-8} alkylamino, C_{3-20} heteroaryl or C_{6-20} aryl;

each instance of Z is, independently, C_{1-8} alkyl, halogen, cyano, or nitro;

n is an integer of 0 to 3; and

L is a linker connecting Ab and W.

2. The antibody conjugate of claim 1, wherein Ab further comprises a combination of a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 2, 6, 12, 16, or 20, and a variable light chain comprising the amino acid sequence of SEQ ID NO: 4, 8, 10, 14, 18, or 22.

3. The antibody conjugate of claim 1, wherein Ab further comprises a combination of a variable heavy chain sequence and a variable light chain sequence selected from:

(a) a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 2 and a variable light chain comprising the amino acid sequence of SEQ ID NO: 4;

(b) a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 6, and a variable light chain comprising the amino acid sequence of SEQ ID NO: 8;

(c) a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 6 and a variable light chain comprising the amino acid sequence of SEQ ID NO: 10;

(d) a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 12 and a variable light chain comprising the amino acid sequence of SEQ ID NO: 14;

(e) a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 16 and a variable light chain comprising the amino acid sequence of SEQ ID NO: 18; and

(f) a variable heavy chain comprising the amino acid sequence of SEQ ID NO: 20 and a variable light chain comprising the amino acid sequence of SEQ ID NO: 22.

4. The antibody conjugate of claim 1, wherein the anti-CD19 antibody is 5F5, 7F11, 9G8, F6, 7F1 or 10D8.

5. The antibody conjugate of any one of the preceding claims, wherein the CD19 is human CD19.

6. The antibody conjugate of any one of the preceding claims, wherein Ab is a monoclonal antibody, a domain antibody (dAb), a single chain antibody (scAb), a Fab fragment, a $F(ab')_2$ fragment, a single chain variable fragment (scFv), a scFv-Fc fragment, a single domain heavy chain antibody, a single domain light chain antibody, a variant antibody, a multimeric antibody, or a bispecific antibody.

7. The antibody conjugate of any one of the preceding claims, wherein Ab is a rabbit, mouse, chimeric, humanized or fully human monoclonal antibody.

8. The antibody conjugate of any one of the preceding claims, wherein Ab is an IgG isotype.

9. The antibody conjugate of any one of the preceding claims, wherein Ab is an IgG1 isotype.

10. The antibody conjugate of any one of the preceding claims, wherein the link between Ab and the active agent is cleavable.

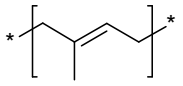
11. The antibody conjugate of any one of claims 1-10, wherein L is C_{1-50} alkylene or 1-50 atom heteroalkylene.

12. The antibody conjugate of claim 11, wherein L comprises:
(i) at least one unsaturated bond;
(ii) a heteroarylene;

(iii) a 1-50 atom heteroalkylene; or

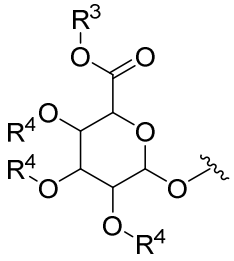
(iv) an alkylene substituted with one or more C_{1-20} alkyls.

13. The antibody conjugate of any one of claims 1-10, wherein L includes at least one isoprenyl derivative unit represented by Formula III, which is recognized by an isoprenoid transferase:



Formula III.

14. The antibody conjugate of any one of claims 1-13, wherein:

G is  ;

R^3 is hydrogen or a carboxyl protecting group; and

each R^4 is independently hydrogen or a hydroxyl protecting group.

15. The antibody conjugate of any one of claims 1-14, wherein R^3 is hydrogen and each R^4 is hydrogen.

16. The antibody conjugate of any one of claims 1-15, wherein each R^1 and R^2 is hydrogen.

17. The antibody conjugate of any one of claims 1-16, wherein n is 0.

18. The antibody conjugate of any one of claims 1-17, wherein W is -C(O)-, -C(O)NR'-, -C(O)O-, -SO_2NR'-, -P(O)R''NR'-, -SONR'-, or -PO_2NR'-, wherein the C, S, or P is directly bound to the phenyl ring, and R' and R" are each independently hydrogen, C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{1-8} alkoxy, C_{1-8} alkylthio, mono- or di-C_{1-8} alkylamino, C_{3-20} heteroaryl or C_{6-20} aryl.

19. The antibody conjugate of any one of claims 1-18, wherein W is -C(O)-, -C(O)NR'-, or -C(O)O-.

20. The antibody conjugate of any one of claims 1-10, wherein L is a nitrogen-containing 1-50 atom heteroalkylene, and further comprises at least two atoms of a hydrophilic amino acid; and the nitrogen forms a peptide bond with a carbonyl of the hydrophilic amino acid.

21. The antibody conjugate of claim 20, wherein W represents -C(O)NR'-, and the nitrogen of W is a nitrogen atom of the hydrophilic amino acid.

22. The antibody conjugate of claim 20 or 21, wherein L further comprises an oxime and the hydrophilic amino acid bonds the oxime to a polyethylene glycol unit of L.

23. The antibody conjugate of any one of claims 20-22, wherein the hydrophilic amino acid is arginine, aspartate, asparagine, glutamate, glutamine, histidine, lysine, ornithine, proline, serine, or threonine.

24. The antibody conjugate of any one of claims 20-23, wherein the hydrophilic amino acid is an amino acid that comprises a side chain having a moiety that bears a charge at neutral pH in aqueous solution.

25. The antibody conjugate of claim 24, wherein the hydrophilic amino acid is aspartate or glutamate.

26. The antibody conjugate of claim 24, wherein the hydrophilic amino acid is ornithine or lysine.

27. The antibody conjugate of claim 24, wherein the hydrophilic amino acid is arginine.

28. The antibody conjugate of any one of claims 1-10, wherein L comprises a peptide and the peptide comprises at least one hydrophilic amino acid, preferably an amino acid having a side chain having a moiety that bears a charge at neutral pH in aqueous solution.

29. The antibody conjugate of claim 28, wherein each amino acid of the peptide is independently selected from alanine, aspartate, asparagine, glutamate, glutamine, glycine, lysine, ornithine, proline, serine, and threonine.

30. The antibody conjugate of claim 28 or 29, wherein the peptide comprises at least one aspartate or glutamate.

31. The antibody conjugate of any one of claims 28-30, wherein W represents -C(O)NR'-, and the nitrogen of W is a nitrogen of the N-terminal amino acid in the peptide.

32. The antibody conjugate of any one of claims 28-31, wherein L further comprises an oxime and the peptide bonds the oxime to a polyethylene glycol unit of L.

33. The antibody conjugate of any one of claims 28-32, wherein the peptide comprises 2 to 20 amino acids.

34. The antibody conjugate of any one of the preceding claims, wherein L is covalently bound to Ab by a thioether bond, and the thioether bond comprises a sulfur atom of a cysteine of the Ab.

35. The antibody conjugate of claim 34, wherein:
Ab comprises an amino acid motif, preferably at a C-terminus of Ab, that is recognized by an isoprenoid transferase; and
the thioether bond comprises a sulfur atom of a cysteine of the amino acid motif.

36. The antibody conjugate of claim 35, wherein:
the amino acid motif has a sequence of CYYX;
C is cysteine;
each Y is an aliphatic amino acid;
X is selected from glutamine, glutamate, serine, cysteine, methionine, alanine, and leucine.

37. The antibody conjugate of claim 36, wherein:
each Y is independently selected from alanine, isoleucine, leucine, methionine, and valine.

38. The antibody conjugate of any one of claims 35-37, wherein the amino acid motif has a sequence of CVIM or CVLL.

39. The antibody conjugate of any one of claims 35-38, wherein at least one of the seven amino acids preceding the amino acid motif is glycine.

40. The antibody conjugate of any one of claims 35-38, wherein at least three of the seven amino acids preceding the amino acid motif are each independently selected from glycine, aspartic acid, arginine, and serine.

41. The antibody conjugate of any one of claims 35-38, wherein at least three of the seven amino acids preceding the amino acid motif are each independently selected from glycine and proline.

42. The antibody conjugate of any one of claims 35-41, wherein each of the one, two, three, four, five, six, seven, eight, nine, or ten amino acids preceding the amino acid motif is glycine.

43. The antibody conjugate of any one of claims 35-42, wherein Ab comprises the amino acid sequence GGGGGGGCVIM, preferably at a C-terminus.

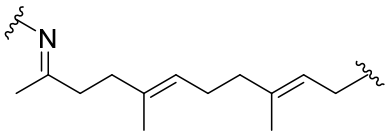
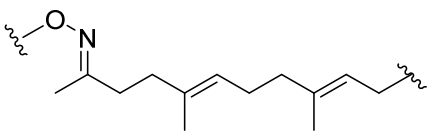
44. The antibody conjugate of any one of claims 1-10, wherein L is a 3-50 heteroalkylene comprising an oxime, wherein:

the oxygen atom of the oxime is on the side of L that is linked to W and the carbon atom of the oxime is on the side of L that is linked to Ab; or

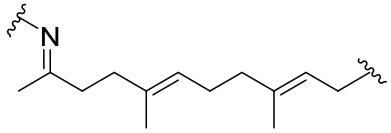
the carbon atom of the oxime is on the side of L that is linked to W and the oxygen atom of the oxime is on the side of L that is linked to Ab.

45. The antibody conjugate of claim 44, wherein L comprises at least one isoprenyl unit that covalently links the oxime to Ab.

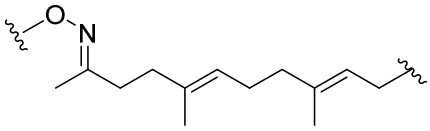
46. The antibody conjugate of any one of claims 1-10, wherein L comprises:

47. The antibody conjugate of any one of claims 1-10, wherein L comprises:



48. The antibody conjugate of any one of claims 1-10, wherein L comprises:



49. The antibody conjugate of any one of claims 1-48, wherein L further comprises a connection unit represented by Formula VIII or IX:

$$-(CH_2)_r(V(CH_2)_p)_q-$$

Formula VIII,

$$-(CH_2CH_2X)_w-$$

Formula IX;

V is a single bond, -O-, -S-, $-NR^{21}-$, $-C(O)NR^{22}-$, $-NR^{23}C(O)-$, $-NR^{24}SO_2-$, or $-SO_2NR^{25}-$;
X is -O-, C_{1-8} alkylene, or $-NR^{21}-$;
R^{21} to R^{25} are each independently hydrogen, C_{1-6} alkyl, C_{1-6} alkyl C_{6-20} aryl, or C_{1-6} alkyl C_{3-20} heteroaryl;
r is an integer of 1 to 10;
p is an integer of 0 to 12;
q is an integer of 1 to 20; and
w is an integer of 1 to 20.

50. The antibody conjugate of claim 49, wherein q is an integer from 4 to 20.

51. The antibody conjugate of claim 49, wherein q is an integer from 2 to 12.

52. The antibody conjugate of claim 49, wherein q is an integer from 6 to 20.

53. The antibody conjugate of claim 49, wherein q is 2, 5 or 11.

54. The antibody conjugate of any one of claims 49-53, wherein r is 2.

55. The antibody conjugate of any one of claims 49-54, wherein p is 2.

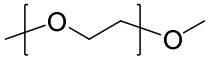
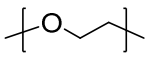
56. The antibody conjugate of any one of claims 49-55, wherein V is -O-.

57. The antibody conjugate of claim 49, wherein:
r is 2;
p is 2;
q is 2, 5, or 11; and
V is -O-.

58. The antibody conjugate of any one of claims 49-57, wherein X is -O-.

59. The antibody conjugate of any one of claims 49-58, wherein w is an integer from 6 to 20.

60. The antibody conjugate of any one of claims 49-57, wherein X is -O- and w is an integer from 6 to 20.

61. The antibody conjugate of any one of claims 1-10, wherein L comprises at least one polyethylene glycol unit, represented by either  or .

62. The antibody conjugate of claim 61, wherein L comprises 1to 12 -OCH_2CH_2- units.

63. The antibody conjugate of claim 61, wherein L comprises 3 to 12 -OCH_2CH_2- units.

64. The antibody conjugate of claim 61, wherein L comprises 5 to 12 -OCH_2CH_2- units.

65. The antibody conjugate of claim 61, wherein L comprises 6 or 12 -OCH_2CH_2- units.

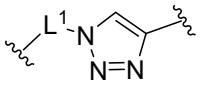
66. The antibody conjugate of claim 61, wherein L comprises 3 $-OCH_2CH_2-$ units.

67. The antibody conjugate of any one of claims 1-10, wherein L comprises an oxime, and the at least one polyethylene glycol unit covalently links the oxime to the active agent.

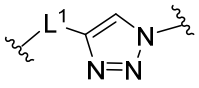
68. The antibody conjugate of any one of claims 1-10, wherein L further comprises a binding unit formed by a 1,3-dipolar cycloaddition reaction, hetero-Diels-Alder reaction, nucleophilic substitution reaction, non-aldol type carbonyl reaction, addition to carbon-carbon multiple bond, oxidation reaction, or click reaction.

69. The antibody conjugate of claim 68, wherein the binding unit is formed by a reaction between acetylene and azide, or a reaction between an aldehyde or ketone group and a hydrazine or alkoxyamine.

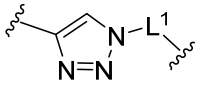
70. The antibody conjugate of any one of claims 1-10, wherein L further comprises a binding unit represented by Formula IV, V, VI, or VII:



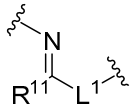
Formula IV



Formula V



Formula VI



Formula VII

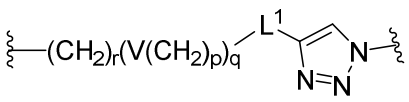
L^1 is a single bond or C_{1-30} alkylene; and
R^{11} is hydrogen or C_{1-10} alkyl.

71. The antibody conjugate of claim 70, wherein L^1 is a single bond.

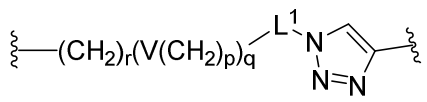
72. The antibody conjugate of claim 70, wherein L^1 is a C_{11} alkylene.

73. The antibody conjugate of claim 70, wherein L^1 is a C_{12} alkylene.

74. The antibody conjugate of any one of claims 1-10, wherein L further comprises:



or



;

V is a single bond, -O-, -S-, -NR^{21}-, -$C(O)NR^{22}$-, -$NR^{23}C(O)$-, -$NR^{24}SO_2$-, or -SO_2NR^{25}-, preferably -O-;

R^{21} to R^{25} are each independently hydrogen, C_{1-6} alkyl, C_{1-6} alkyl C_{6-20} aryl, or C_{1-6} alkyl C_{3-20} heteroaryl;

r is an integer from 1 to 10;

p is an integer from 0 to 10;

q is an integer from 1 to 20; and

L_1 is a single bond.

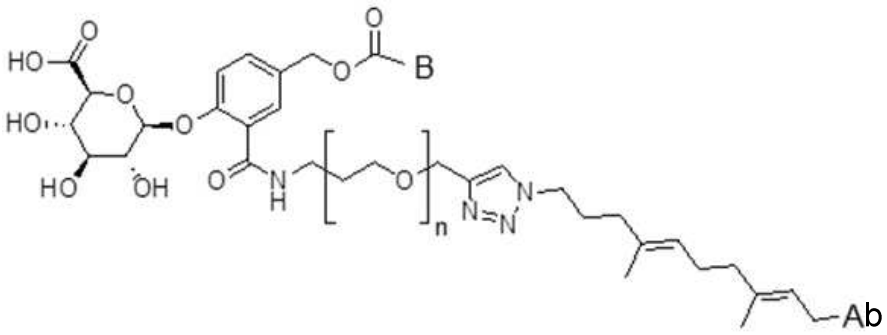
75. The antibody conjugate of claim 74, wherein r is 2 or 3.

76. The antibody conjugate of claim 74 or 75, wherein p is 1 or 2.

77. The antibody conjugate of any one of claims 74-76, wherein q is 1 to 6.

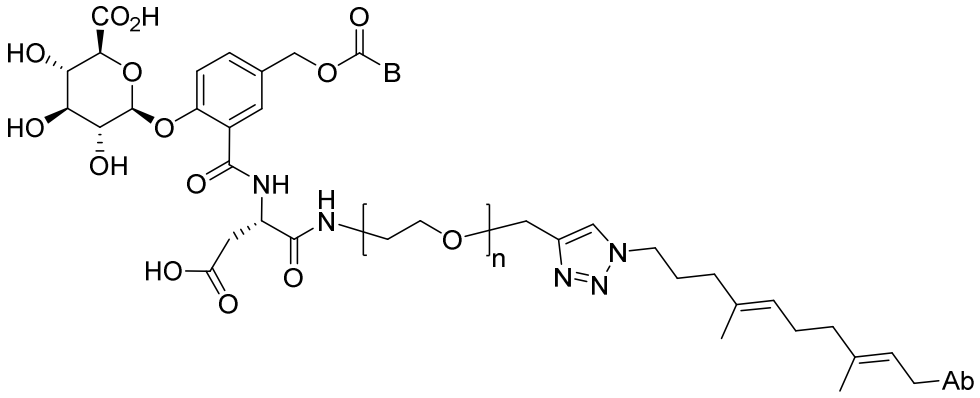
78. The antibody conjugate of claim 74, wherein r is 2 or 3; p is 1 or 2; and q is 1 to 6.

79. The antibody conjugate of any one of claims 1-10, comprising the structure:



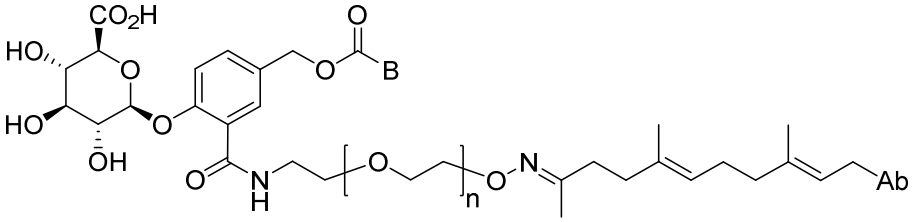
wherein n is an integer from 1 to 20.

80. The antibody conjugate of any one of claims 1-10, comprising the structure:



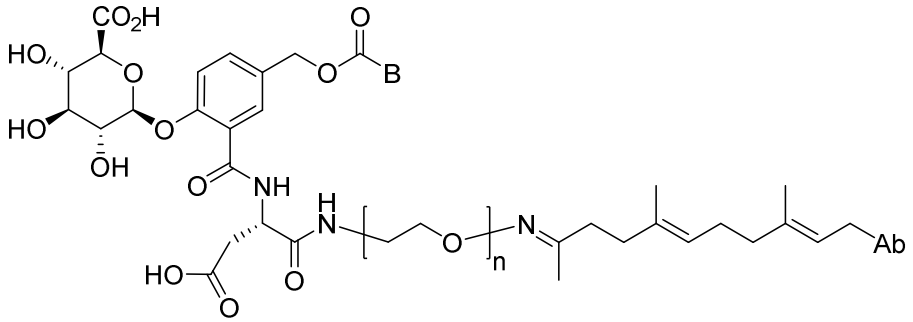
wherein n is an integer from 1 to 20.

81. The antibody conjugate of any one of claims 1-10, comprising the structure:



wherein n is an integer from 0 to 20.

82. The antibody conjugate of any one of claims 1-10, comprising the structure:



wherein n is an integer from 1 to 20.

83. The antibody conjugate of claim 13 or 35, wherein the isoprenoid transferase is farnesyl protein transferase (FTase) or geranylgeranyl transferase (GGTase).

84. The antibody conjugate of any one of claims 1-10, wherein L comprises one or more branched linkers covalently coupled to Ab, wherein:

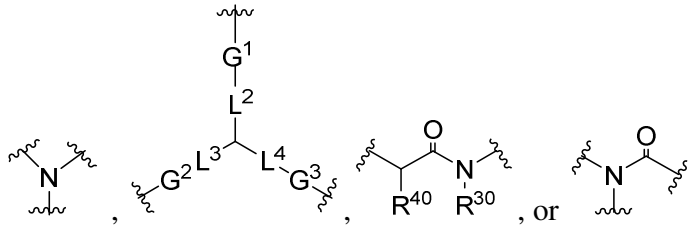
i) each branched linker comprises a branching unit (BR) covalently coupled to Ab by a primary linker (PL);

ii) each branched linker comprises a first branch (B1), which couples a first active agent to the branching unit and comprises a secondary linker (SL) and a cleavage group (CG); and

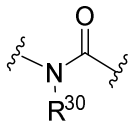
iii) each branched linker further comprises a second branch (B2), in which either a) a second active agent is covalently coupled to the branching unit by a secondary linker (SL) and a cleavage group (CG); or b) a polyethylene glycol moiety is covalently coupled to the branching unit, and

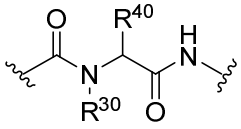
wherein each cleavage group can be hydrolyzed to release the active agent from the antibody conjugate.

85. The antibody conjugate of claim 84, wherein at least one branching unit has the structure

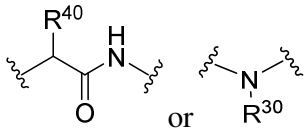


wherein L^2, L^3, L^4 is each independently a direct bond or $-C_nH_{2n}-$ where n is an integer of 1to 30,

wherein G^1, G^2, G^3 is each independently a direct bond, 

, 

,



,

wherein R^{30} is hydrogen or C_{1-30} alkyl; and

wherein R^{40} is L^5-$COOR^{50}$, wherein L^5 is a direct bond or C_{1-10} alkylene, and R^{50} is hydrogen or C_{1-30} alkyl.

86. The antibody conjugate of claim 84 or 85, wherein the antibody conjugate comprises Ab; at least one branched linker covalently coupled to Ab; and at least two active agents covalently coupled to the branched linker.

87. The antibody conjugate of any one of claims 84-86, wherein at least two branched linkers are coupled to Ab, and each branched linker is coupled to at least two active agents.

88. The antibody conjugate of claim 87, wherein three branched linkers are coupled to Ab.

89. The antibody conjugate of claim 87, wherein four branched linkers are coupled to Ab.

90. The antibody conjugate of any one of claims 84-86, wherein exactly one branched linker is coupled to Ab.

91. The antibody conjugate of any one of claims 84-90, wherein each branched linker is coupled to exactly two active agents.

92. The antibody conjugate of any one of claims 84-91, wherein the conjugate comprises at least two different active agents.

93. The antibody conjugate of any one of claims 84-92, wherein at least one branched linker is coupled to two different active agents.

94. The antibody conjugate of any one of claims 84-93, wherein each active agent is coupled to a branched linker by a cleavable bond.

95. The antibody conjugate of any one of claims 84-94, wherein each branched linker comprises a branching unit, and each active agent is coupled to the branching unit through a secondary linker and the branching unit is coupled to Ab by a primary linker.

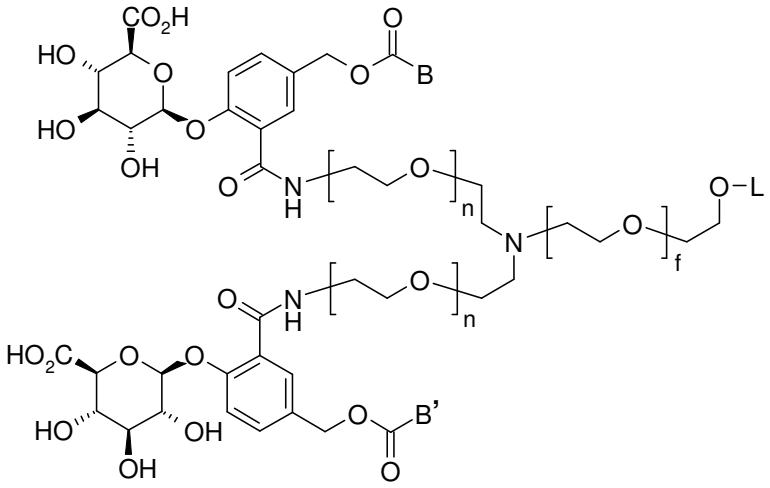
96. The antibody conjugate of claim 95, wherein the branching unit is a nitrogen atom.

97. The antibody conjugate of claim 95 or 96, wherein the branching unit is an amide and the primary linker comprises the carbonyl of the amide.

98. The antibody conjugate of claim 95 or 96, wherein the branching unit is an amide and the secondary linker comprises the carbonyl of the amide.

99. The antibody conjugate of claim 95, wherein the branching unit is a lysine unit.

100. The antibody conjugate of claim 84, comprising the structure:



wherein:

B and B' represent active agents, which may be the same or different;

n, independently for each occurrence, represents an integer from 0 to 30;

f, independently for each occurrence, represents an integer from 0 to 30; and

L represents a linkage to the Ab.

101. The antibody conjugate of claim 100, wherein n is an integer from 1 to 10.

102. The antibody conjugate of claim 100, wherein n is an integer from 4 to 20.

103. The antibody conjugate of any one of claims 1-102, wherein the active agent is independently selected from chemotherapeutic agents and toxins.

104. The antibody conjugate of claim 103, wherein the active agent is a chemotherapeutic agent.

105. The antibody conjugate of claim 103 or 104, wherein the active agent is an immunomodulatory compound, an anticancer agent, an antiviral agent, an antibacterial agent, an antifungal agent, an antiparasitic agent, or a combination thereof.

106. The antibody conjugate of any one of claims 1-102, wherein the active agent is independently selected from:

(a) erlotinib, bortezomib, fulvestrant, sunitinib, letrozole, imatinib mesylate, PTK787/ZK 222584, oxaliplatin, 5-fluorouracil, leucovorin, rapamycin, lapatinib, lonafarnib, sorafenib, gefitinib, AG1478, AG1571, thiotepa, cyclophosphamide, busulfan, improsulfan, piposulfan, benzodopa, carboquone, meturedopa, uredopa, ethylenimine, altretamine, triethylenemelamine, trietylenephosphormide, triethiylenethiophosphoramide, trimethylolomelamine, bullatacin, bullatacinone, camptothecin, topotecan, bryostatin, callystatin, CC-1065, adozelesin, carzelesin, bizelesin, cryptophycin 1, cryptophycin 8, dolastatin, duocarmycin, KW-2189, CB1-TM1, eleutherobin, pancratistatin, sarcodictyin, spongistatin, chlorambucil, chlornaphazine, cholophosphamide, estramustine, ifosfamide, mechlorethamine, melphalan, novembichin, phenesterine, prednimustine, trofosfamide, uracil mustard, carmustine, chlorozotocin, fotemustine, lomustine, nimustine, ranimnustine, calicheamicin, calicheamicin gamma 1, calicheamicin omega 1, dynemicin, dynemicin A, clodronate, esperamicin, neocarzinostatin chromophore, aclacinomysins, actinomycin, antimycin, azaserine, bleomycins, cactinomycin, carabicin, carninomycin, carzinophilin, chromomycins, dactinomycin, daunorubicin, 6-diazo-5-oxo-L-norleucine, doxorubicin, morpholino-doxorubicin, cyanomorpholino-doxorubicin, 2-pyrrolino-doxorubucin, liposomal doxorubicin, deoxydoxorubicin, epirubicin, esorubicin, marcellomycin, mitomycin C, mycophenolic acid, nogalamycin, olivomycins, peplomycin, potfiromycin, puromycin, quelamycin, rodorubicin, streptomigrin, streptozocin, tubercidin, ubenimex, zinostatin, zorubicin, denopterin, methotrexate, pteropterin, trimetrexate, fludarabine, 6-mercaptopurine, thiamiprine, thiguanine, ancitabine, azacitidine, 6-azauridine, carmofur, cytarabine, dideoxyuridine, doxifluridine, enocitabine, floxuridine, calusterone, dromostanolone propionate, epitiostanol, mepitiostane, testolactone, aminoglutethimide, mitotane, trilostane, folinic acid, aceglatone, aldophosphamide glycoside, aminolevulinic acid, eniluracil, amsacrine, bestrabucil, bisantrene, edatraxate, demecolcine, diaziquone, elfornithine, elliptinium acetate, etoglucid, gallium nitrate, hydroxyurea, lentinan, lonidainine, maytansine, ansamitocins, mitoguazone, mitoxantrone, mopidanmol, pentostatin, phenamet, pirarubicin, losoxantrone, 2-ethylhydrazide, procarbazine, polysaccharide-k, razoxane, rhizoxin, sizofiran, spirogermanium, tenuazonic acid, triaziquone, 2,2',2''-trichlorotriethylamine, T-2 toxin, verracurin A, roridin A, and anguidine, urethane, vindesine, dacarbazine, mannomustine, mitobronitol, mitolactol,

pipobroman, gacytosine, arabinoside, cyclophosphamide, paclitaxel, albumin-engineered nanoparticle formulation of paclitaxel, doxetaxel, chlorambucil, gemcitabine, 6-thioguanine, mercaptopurine, cisplatin, carboplatin, vinblastine, platinum, etoposide, mitoxantrone, vincristine, vinorelbine, novantrone, teniposide, edatrexate, daunomycin, aminopterin, ibandronate, CPT-11, topoisomerase inhibitor RFS 2000, difluoromethylornithine, retinoic acid, capecitabine, or pharmaceutically acceptable salts, solvates or acids of any of the foregoing;

(b) monokine, a lymphokine, a traditional polypeptide hormone, parathyroid hormone, thyroxine, relaxin, prorelaxin, a glycoprotein hormone, follicle stimulating hormone, thyroid stimulating hormone, luteinizing hormone, hepatic growth factor, fibroblast growth factor, prolactin, placental lactogen, tumor necrosis factor-α, tumor necrosis factor-β, mullerian-inhibiting substance, mouse gonadotropin-associated peptide, inhibin, activin, vascular endothelial growth factor, thrombopoietin, erythropoietin, an osteoinductive factor, an interferon, interferon-α, interferon-β, interferon-γ, a colony stimulating factor ("CSF"), macrophage-CSF, granulocyte-macrophage-CSF, granulocyte-CSF, an interleukin ("IL"), IL-1, IL-1α, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-11, IL-12, a tumor necrosis factor, TNF-α, TNF-β, a polypeptide factor, LIF, kit ligand, or a combination of any of the foregoing;

(c) diphtheria toxin, botulium toxin, tetanus toxin, dysentery toxin, cholera toxin, amanitin, α-amanitin, pyrrolobenzodiazepine, tetrodotoxin, brevetoxin, ciguatoxin, ricin, AM toxin, auristatin, tubulysin, geldanamycin, maytansinoid, calicheamicin, daunomycin, doxorubicin, methotrexate, vindesine, SG2285, dolastatin, cryptophycin, camptothecin, rhizoxin, CC-1065, duocarmycin, an enediyne antibiotic, esperamicin, epothilone, azonafide, aplidine, a toxoid, or a combination of any of the foregoing;

(d) an affinity ligand, wherein the affinity ligand is a substrate, an inhibitor, a stimulating agent, a neurotransmitter, a radioisotope, or a combination of any of the foregoing;

(e) a radioactive label, ^{32}P, ^{35}S, a fluorescent dye, an electron dense reagent, an enzyme, biotin, streptavidin, digoxigenin, a hapten, an immunogenic protein, a nucleic acid molecule with a sequence complementary to a target, or a combination of any of the foregoing;

(f) an immunomodulatory compound, an anti-cancer agent, an anti-viral agent, an anti-bacterial agent, an anti-fungal agent, and an anti-parasitic agent, or a combination of any of the foregoing;

(g) tamoxifen, raloxifene, droloxifene, 4-hydroxytamoxifen, trioxifene, LY117018, onapristone, or toremifene;

(h) 4(5)-imidazoles, aminoglutethimide, megestrol acetate, exemestane, letrozole, or anastrozole;

(i) flutamide, nilutamide, bicalutamide, leuprolide, goserelin, or troxacitabine;

(j) an aromatase inhibitor;

(k) a protein kinase inhibitor;

(l) a lipid kinase inhibitor;

(m) an antisense oligonucleotide;

(n) a ribozyme;

(o) a vaccine; and

(p) an anti-angiogenic agent.

107. The antibody conjugate of any one of claims 1-106, wherein:

the active agent is a pyrrolobenzodiazepine dimer; and

the linker links Ab to the N10 or N'10 position of the pyrrolobenzodiazepine dimer.

108. The antibody conjugate of claim 1-107, wherein:

the active agent is a pyrrolobenzodiazepine dimer;

the pyrrolobenzodiazepine dimer is substituted at the N10 position with X or at the N'10 position with X', wherein X or X' links the pyrrolobenzodiazepine dimer to the linker;

X and X' are each independently selected from -C(O)O-*, -S(O)O-*, -C(O)-*, -C(O)NR^X-*, -$S(O)_2NR^X$-*, -$(P(O)R^{X'})NR^X$-*, -S(O)NR^X-*, and -PO_2NR^X-*;

R^X is H, C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{3-20} heteroaryl, or C_{5-20} aryl;

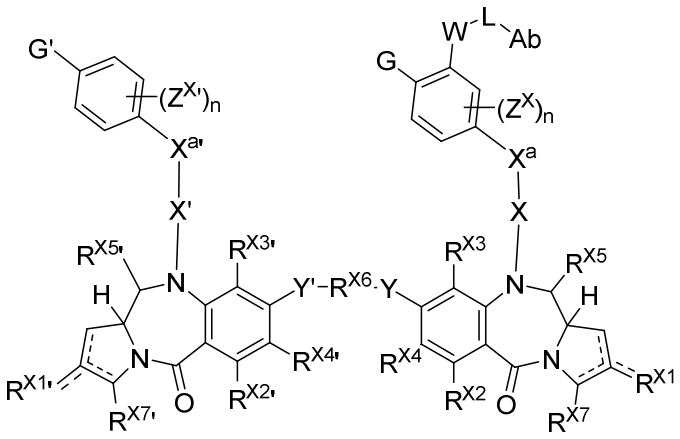
$R^{X'}$ is OH, N_3, CN, SH, C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{1-8} alkoxy, C_{1-8} alkylthio, C_{3-20} heteroaryl, C_{5-20} aryl, or amino; and

* represents the attachment point between the pyrrolobenzodiazepine dimer and the linker.

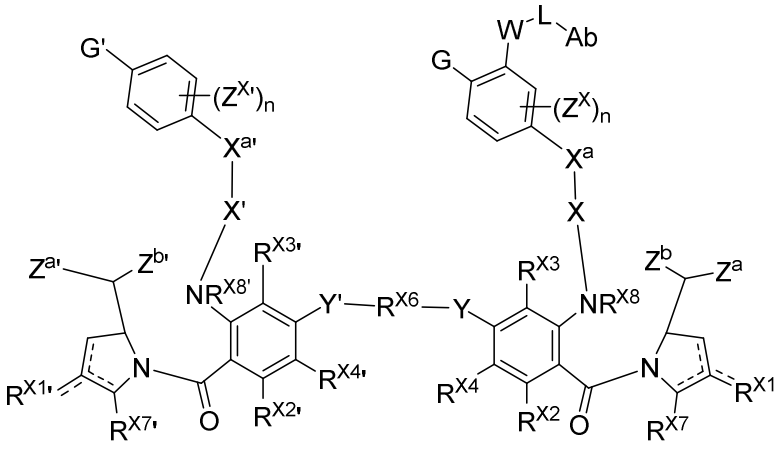
109. The antibody conjugate of claim 108, wherein:

X and X' are each independently selected from -C(O)O-*, -C(O)-* and -C(O)NR^X-*.

110. The antibody conjugate of any one of any one of claims 1-10, wherein the antibody conjugate has a structure represented by Formula XII or Formula XIII:



Formula XII



Formula XIII

wherein:

X and X' are each independently selected from -C(O)O-, -S(O)O-, -C(O)-, -C(O)NR^X-, -$S(O)_2NR^X$-, -$P(O)R^{X'}NR^X$-, -S(O)NR^X-, and -PO_2NR^X-;

R^{X1} and $R^{X1'}$ are independently selected from H, OH, =O, =CH_2, CN, R^m, OR^m, =CH-$R^{m'}$ =$C(R^{m'})_2$, O-SO_2-R^m, CO_2R^m, COR^m, halo and dihalo;

$R^{m'}$ is independently selected from R^m, CO_2R^m, COR^m, CHO, CO_2H, and halo;

each R^m is independently selected from C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{5-20} aryl, C_{5-20} heteroaryl, C_{3-6} cycloalkyl, 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, and 5- to 7-membered heteroaryl;

R^{X2}, $R^{X2'}$, R^{X3}, $R^{X3'}$, R^{X5}, and $R^{X5'}$ are each independently selected from H, R^m, OH, OR^m, SH, SR^m, NH_2, NHR^m, $NR^m{}_2$, NO_2, Me_3Sn and halo;

R^{X4} and $R^{X4'}$ are independently selected from H, R^m, OH, OR^m, SH, SR^m, NH_2, NHR^m, $NR^m{}_2$, NO_2, Me_3Sn, halo, C_{1-6} alkyl, C_{1-6} alkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-12} aryl, 5- to 7-membered heteroaryl, -CN, -NCO, -OR^n, -$OC(O)R^n$, -$OC(O)NR^nR^{n'}$, -$OS(O)R^n$, -$OS(O)_2R^n$, -SR^n, -$S(O)R^n$, -$S(O)_2R^n$, -$S(O)NR^nR^{n'}$, -$S(O)_2NR^nR^{n'}$, -$OS(O)NR^nR^{n'}$, -$OS(O)_2NR^nR^{n'}$, -$NR^nR^{n'}$, -$NR^nC(O)R^o$, -$NR^nC(O)OR^o$, -$NR^nC(O)NR^oR^{o'}$, -$NR^nS(O)R^o$, -$NR^nS(O)_2R^o$, -$NR^nS(O)NR^oR^{o'}$, -$NR^nS(O)_2NR^oR^{o'}$, -$C(O)R^n$, -$C(O)OR^n$ and -$C(O)NR^nR^{n'}$;

R^X and $R^{X'}$ are independently selected from H, OH, and C_{1-8} alkyl;

Y and Y' are independently selected from O, S, and N(H);

R^{X6} is C_{3-12} alkylene, C_{3-12} alkenylene, or C_{3-12} heteroalkylene;

R^{X7} and $R^{X7'}$ are independently selected from H, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{6-10} aryl, 5- to 7-membered heteroaryl, -OR^r, -$OC(O)R^r$, -$OC(O)NR^rR^{r'}$, -$OS(O)R^r$, -$OS(O)_2R^r$, -SR^r, -$S(O)R^r$, -$S(O)_2R^r$, -$S(O)NR^rR^{r'}$, -$S(O)_2NR^rR^{r'}$, -$OS(O)NR^rR^{r'}$, -$OS(O)_2NR^rR^{r'}$, -$NR^rR^{r'}$, -$NR^rC(O)R^s$, -$NR^rC(O)OR^s$, -$NR^rC(O)NR^sR^{s'}$, -$NR^rS(O)R^s$, -$NR^rS(O)_2R^s$, -$NR^rS(O)NR^sR^{s'}$, -$NR^rS(O)_2NR^sR^s$, -$C(O)R^r$, -$C(O)OR^s$ or -$C(O)NR^rR^{r'}$;

each R^r, $R^{r'}$, R^s, and $R^{s'}$ is independently selected from H, C_{1-7} alkyl, C_{2-7} alkenyl, C_{2-7} alkynyl, C_{3-13} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-10} aryl, and 5- to 7-membered heteroaryl;

each R^{X8} and $R^{X8'}$ is independently selected from H, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6} alkynyl, C_{3-6} heteroalkyl, 3- to 7-membered heterocycloalkyl, C_{5-10} aryl, 5- to 7-membered heteroaryl, -$S(O)R^m$, -$S(O)_2R^m$, -$S(O)NR^mR^{m'}$, -$S(O)_2NR^mR^{m'}$, -$NR^mR^{m'}$, -$NR^mC(O)R^m$, -$NR^mC(O)OR^n$, -$NR^mC(O)NR^nR^{n'}$, -$NR^mS(O)R^n$, -$NR^mS(O)_2R^n$, -$NR^mS(O)NR^nR^{n'}$, -$NR^mS(O)_2NR^nR^{n'}$, -$C(O)R^m$, -$C(O)OR^m$ and -$C(O)NR^mR^{m'}$;

Z^a is selected from OR^{X12a}, $NR^{X12a}R^{X12a}$, or SR^{X12a};

Z^b is selected from OR^{X13a}, $NR^{X13a}R^{X13a}$, or SR^{X13a};

$Z^{a'}$ is selected from $OR^{X12a'}$, $NR^{X12a'}R^{X12a'}$, or $SR^{X12a'}$;

$Z^{b'}$ is selected from $OR^{X13a'}$, $NR^{X13a'}R^{X13a'}$, or $SR^{X13a'}$;

each of R^{X12a}, $R^{X12a'}$, R^{X13a}, and $R^{X13a'}$ is independently selected from absent, H, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-10} aryl, 5- to 7-membered heteroaryl, -$C(O)R^{X15a}$, -$C(O)OR^{X15a}$ and -$C(O)NR^{X15a}R^{X15a'}$;

each R^{X15a} and $R^{X15a''}$ is independently selected from C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{5-20} aryl, C_{5-20} heteroaryl, C_{3-6} cycloalkyl, 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, and 5- to 7-membered heteroaryl;

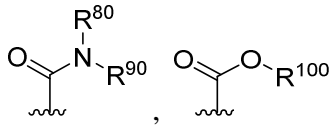
R^{X12a} and R^{X13a} optionally join the atoms to which they are attached to form a 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, or 3- to 7-membered heteroaryl, and

$R^{X12a'}$ and $R^{X13a'}$ optionally join the atoms to which they are attached to form a 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, or 3- to 7-membered heteroaryl; and

wherein each R^n, $R^{n'}$, R^o, $R^{o'}$, R^p, and $R^{p'}$ is independently selected from H, C_{1-7} alkyl, C_{2-7} alkenyl, C_{2-7} alkynyl, C_{3-13} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-10} aryl, and 5- to 7-membered heteroaryl;

X^a and $X^{a'}$ are independently selected from a bond or C_{1-6} alkylene;

$Z^{X'}$ and Z^X are each independently selected from hydrogen, C_{1-8} alkyl, halogen, cyano, nitro,



, and $-(CH_2)_m-OCH_3$;

R^{80} and R^{90} are each independently selected from hydrogen, C_{1-8} alkyl, C_{2-6} alkenyl, C_{1-6} alkoxy, and methoxyethyl;

R^{100} is selected from hydrogen, C_{1-8} alkyl, C_{2-6} alkenyl, and C_{1-6} alkoxy; and

m is 1 to 12.

111. The antibody conjugate of claim 110, wherein each R^m is independently selected from C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{5-20} aryl, C_{5-20} heteroaryl, C_{3-6} cycloalkyl, 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, and 5- to 7-membered heteroaryl; and

wherein the respective hydrogen atoms in the C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{5-20} aryl, C_{3-6} heteroaryl, C_{3-6} cycloalkyl, 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, or 5- to 7-membered heteroaryl are each optionally substituted with one or more C_{1-12} alkyl, C_{2-12} alkenyl, C_{2-12} alkynyl, C_{5-20} aryl, C_{5-20} heteroaryl, C_{3-6} cycloalkyl, 3- to 7-membered heterocyclyl, 3- to 7-membered heterocycloalkyl, or 5- to 7-membered heteroaryl.

112. The antibody conjugate of claim 110, wherein R^{X4} and $R^{X4'}$ are independently selected from H, R^m, OH, OR^m, SH, SR^m, NH_2, NHR^m, $NR^mR^{m'}$, NO_2, Me_3Sn, halo, C_{1-6} alkyl, C_{1-6}

alkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-12} aryl, 5- to 7-membered heteroaryl, -CN, -NCO, -OR^n, -$OC(O)R^n$, -$OC(O)NR^nR^{n'}$, -$OS(O)R^n$, -$OS(O)_2R^n$, -SR^n, -$S(O)R^n$, -$S(O)_2R^n$, -$S(O)NR^nR^{n'}$, -$S(O)_2NR^nR^{n'}$, -$OS(O)NR^nR^{n'}$, -$OS(O)_2NR^nR^{n'}$, -$NR^nR^{n'}$, -$NR^nC(O)R^o$, -$NR^nC(O)OR^o$, -$NR^nC(O)NR^oR^{o'}$, -$NR^nS(O)R^o$, -$NR^nS(O)_2R^o$, -$NR^nS(O)NR^oR^{o'}$, -$NR^nS(O)_2NR^oR^{o'}$, -$C(O)R^n$, -$C(O)OR^n$ and -$C(O)NR^nR^{n'}$,

wherein, when R^{X4} or $R^{X4'}$ is C_{1-6} alkyl, C_{1-6} alkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-12} aryl, 5- to 7-membered heteroaryl, the hydrogen atoms in the C_{1-6} alkyl, C_{1-6} alkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-12} aryl, and 5- to 7-membered heteroaryl are each optionally substituted with C_{1-6} alkyl, C_{1-6} alkoxy, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-10} aryl, 5- to 7-membered heteroaryl, -OR^p, -$OC(O)R^p$, -$OC(O)NR^pR^{p'}$, -$OS(O)R^p$, -$OS(O)_2R^p$, -SR^p, -$S(O)R^p$, -$S(O)_2R^p$, -$S(O)NR^pR^{p'}$, -$S(O)_2NR^pR^{p'}$, -$OS(O)NR^pR^{p'}$, -$OS(O)_2NR^pR^{p'}$, -$NR^pR^{p'}$, -$NR^pC(O)R^q$, -$NR^pC(O)OR^q$, -$NR^pC(O)NR^qR^{q'}$, -$NR^pS(O)R^q$, -$NR^pS(O)_2R^q$, -$NR^pS(O)NR^qR^{q'}$, -$NR^pS(O)_2NR^qR^{q'}$, -$C(O)R^p$, -$C(O)OR^p$ or -$C(O)NR^pR^p$.

113. The antibody conjugate of claim 110, wherein R^{X7} and $R^{X7'}$ are independently selected from H, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{6-10} aryl, 5- to 7-membered heteroaryl, -OR^r, -$OC(O)R^r$, -$OC(O)NR^rR^{r'}$, -$OS(O)R^r$, -$OS(O)_2R^r$, -SR^r, -$S(O)R^r$, -$S(O)_2R^r$, -$S(O)NR^rR^{r'}$, -$S(O)_2NR^rR^{r'}$, -$OS(O)NR^rR^{r'}$, -$OS(O)_2NR^rR^{r'}$, -$NR^rR^{r'}$, -$NR^rC(O)R^s$, -$NR^rC(O)OR^s$, -$NR^rC(O)NR^sR^{s'}$, -$NR^rS(O)R^s$, -$NR^rS(O)_2R^s$, -$NR^rS(O)NR^sR^{s'}$, -$NR^rS(O)_2NR^sR^s$, -$C(O)R^r$, -$C(O)OR^s$ or -$C(O)NR^rR^{r'}$,

wherein, when R^{X7} or $R^{X7'}$ is C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{6-10} aryl, 5- to 7-membered heteroaryl, the hydrogen atoms in the C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{6-10} aryl, and 5- to 7-membered heteroaryl are each optionally substituted with C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{6-10} aryl, 5- to 7-membered heteroaryl, -OR^t, -$OC(O)R^t$, -$OC(O)NR^tR^{t'}$, -$OS(O)R^t$, -$OS(O)_2R^t$, -SR^t, -$S(O)R^t$, -$S(O)_2R^t$, -$S(O)NR^tR^{t'}$, -$S(O)_2NR^tR^{t'}$, -$OS(O)NR^tR^{t'}$, -$OS(O)_2NR^tR^{t'}$, -$NR^tR^{t'}$, -$NR^tC(O)R^u$, -$NR^tC(O)OR^u$, -$NR^tC(O)NR^uR^{u'}$, -$NR^tS(O)R^u$, -$NR^tS(O)_2R^u$, -$NR^tS(O)NR^uR^{u'}$, -$NR^tS(O)_2NR^uR^{u'}$, -$C(O)R^t$, -$C(O)OR^t$ or -$C(O)NR^tR^{t'}$,

wherein, each of R^r, $R^{r'}$, R^s, $R^{s'}$, R^t, $R^{t'}$, R^u and $R^{u'}$ is independently selected from H, C_{1-7} alkyl, C_{2-7} alkenyl, C_{2-7} alkynyl, C_{3-13} cycloalkyl, 3- to 7-membered heterocycloalkyl, C_{5-10} aryl, and 5- to 7-membered heteroaryl.

114. The antibody conjugate of claim 110, wherein:
R^{X1} and $R^{X1'}$ are independently selected from R^m; and
R^m is selected from C_{1-6} alkyl, C_{2-6} alkenyl, C_{5-7} aryl and C_{3-6} heteroaryl.

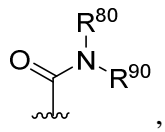
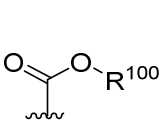
115. The antibody conjugate of claim 110, wherein R^{X2}, $R^{X2'}$, R^{X3}, $R^{X3'}$, R^{X5}, and $R^{X5'}$ are independently selected from H or OH.

116. The antibody conjugate of claim 110, wherein:
R^{X4} and $R^{X4'}$ are independently selected from R^m; and
R^m is C_{1-6} alkoxy.

117. The antibody conjugate of claim 110, wherein R^{X4} and $R^{X4'}$ are independently selected from methoxy, ethoxy, or butoxy.

118. The antibody conjugate of claim 110, wherein Y and Y' are O.

119. The antibody conjugate of claim 110, wherein:
R^{X6} is C_{3-12} alkylene, C_{3-12} alkyenylene, C_{3-12} heteroalkylene, wherein:
R^{X6} is optionally substituted with $–NH_2$, $-NHR^m$, $-NHC(O)R^m$, $-NHC(O)CH_2-[OCH_2CH_2]_n-R^{XX}$, or $-[CH_2CH_2O]_n-R^{XX}$;
wherein R^{XX} is selected from H, OH, N_3, CN, NO_2, SH, NH_2, ONH_2, $NHNH_2$, halo, C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{1-8} alkoxy, C_{1-8} alkylthio, C_{3-20} heteroaryl, C_{5-20} aryl or mono- or di-C_{1-8} alkylamino; and
n is an integer from 1 to 6.

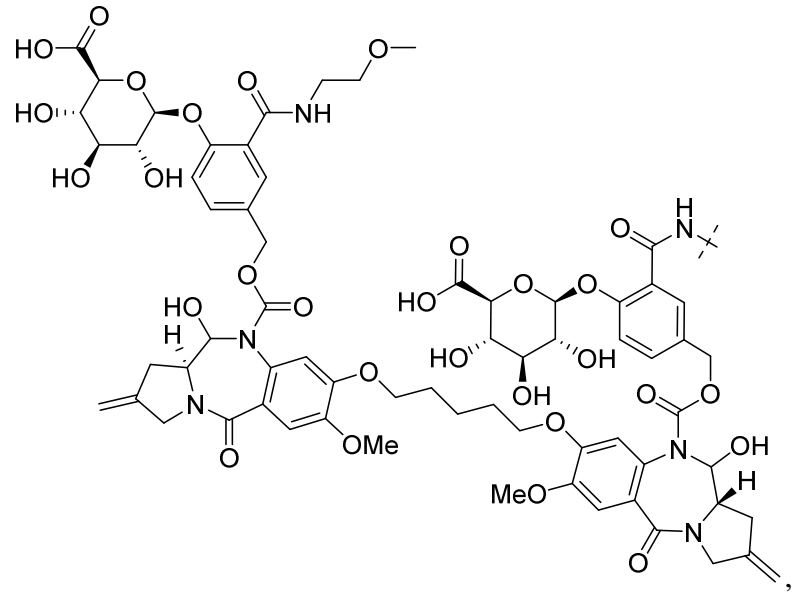
120. The antibody conjugate of any one of claims 110-119, wherein $Z^{X'}$ and Z^X are each independently selected from hydrogen, ,  and $-(CH_2)_m-OCH_3$;

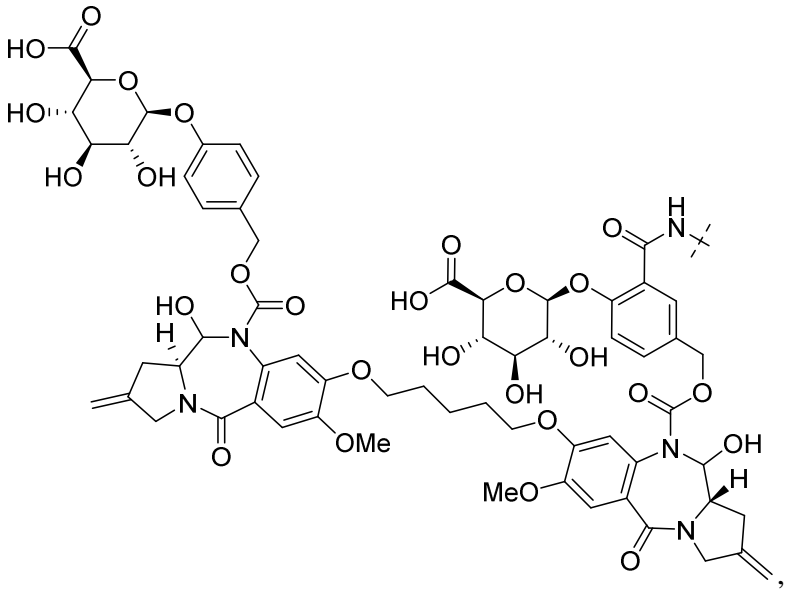
R^{80} and R^{90} are each independently selected from hydrogen, C_{1-3} alkyl, C_{1-3} alkoxy, and methoxyethyl;

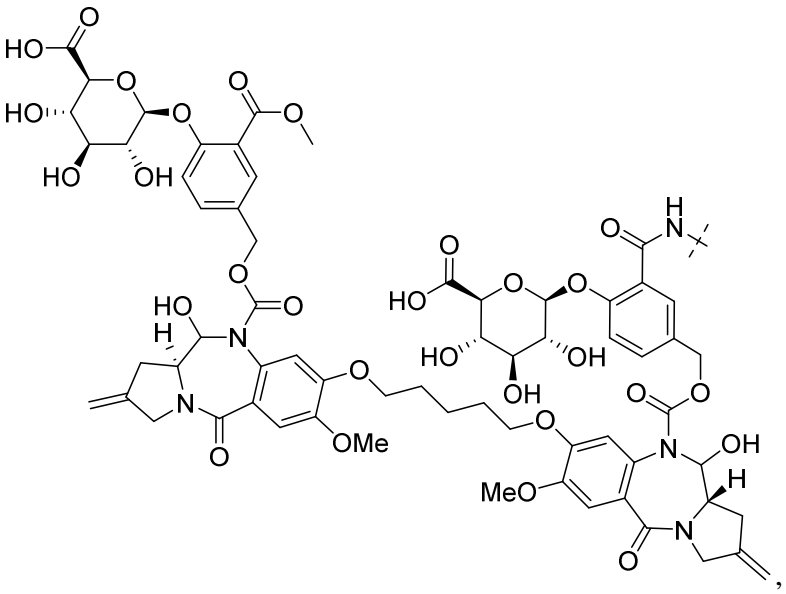
R^{100} is selected from hydrogen, C_{1-3} alkyl and C_{1-3} alkoxy;

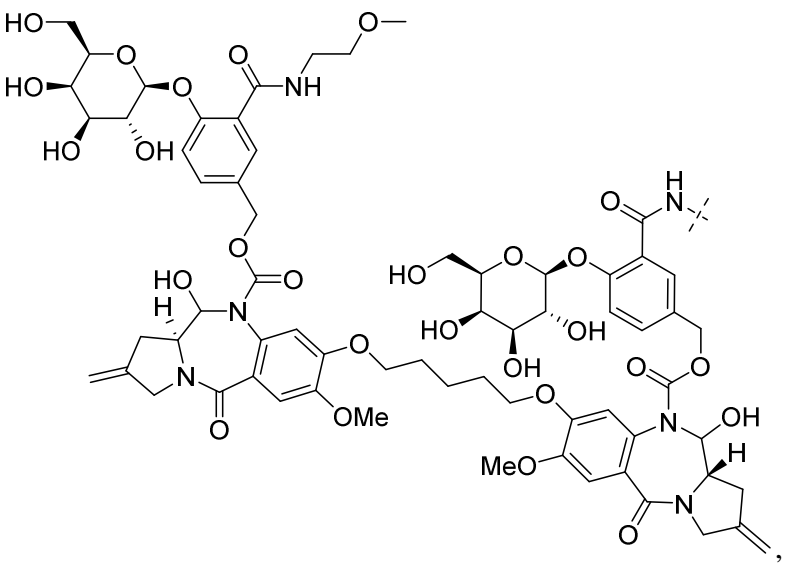
m is an integer of 1-6.

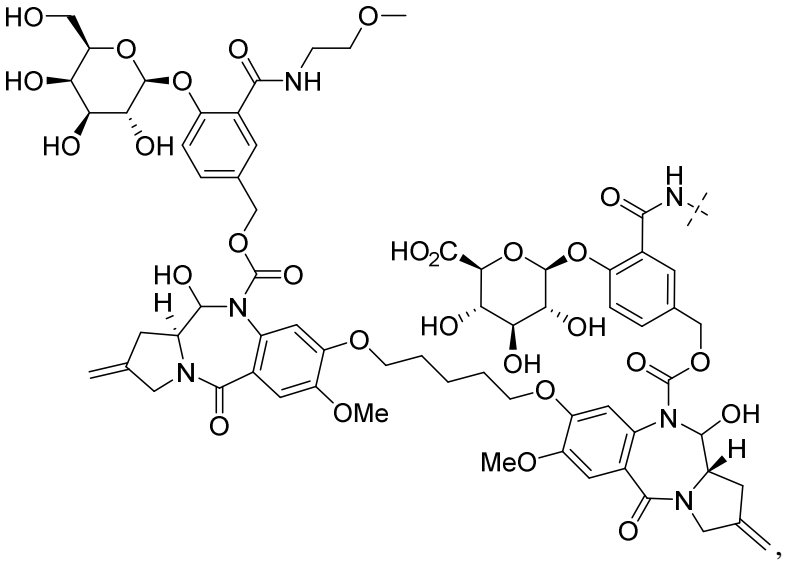
121. The antibody conjugate of any one of claims 1-10, wherein X comprises:

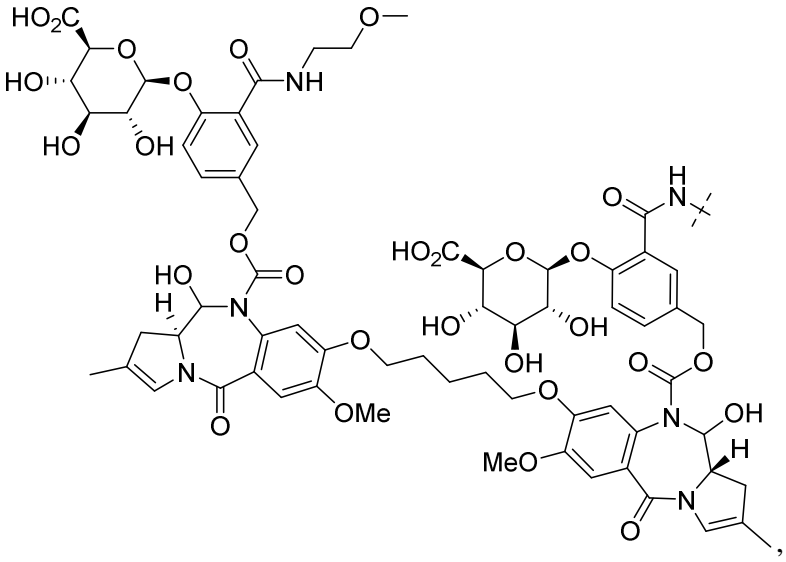


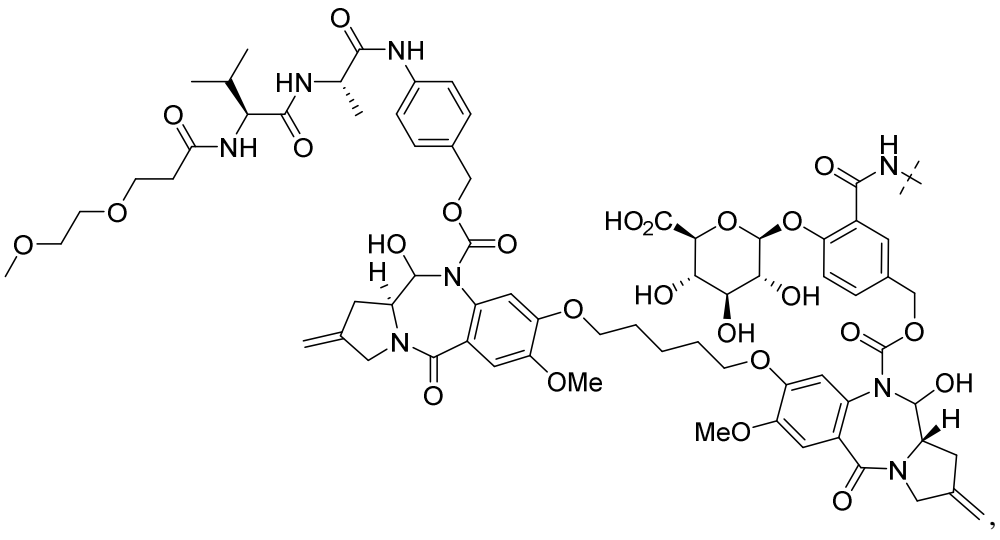


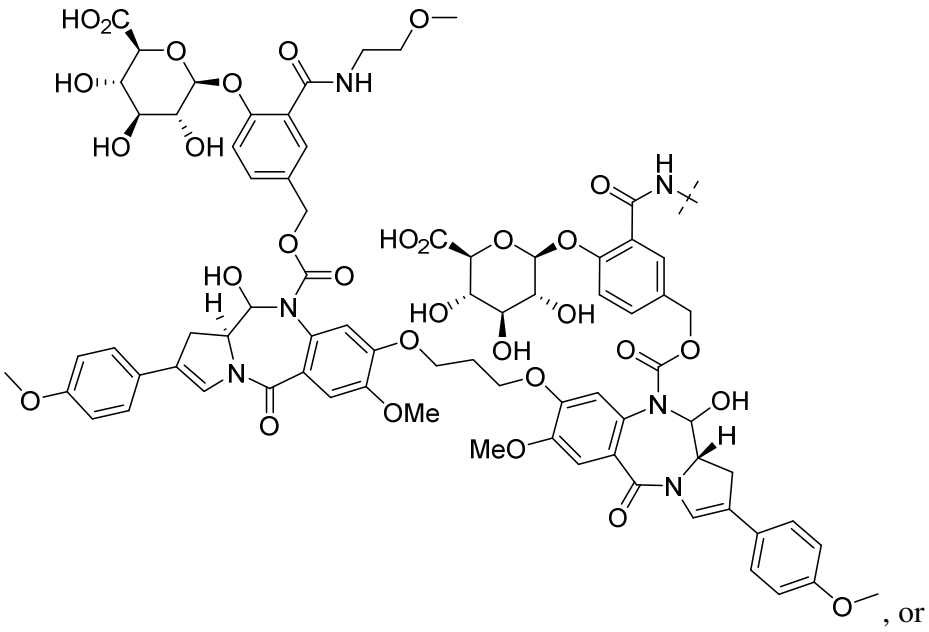




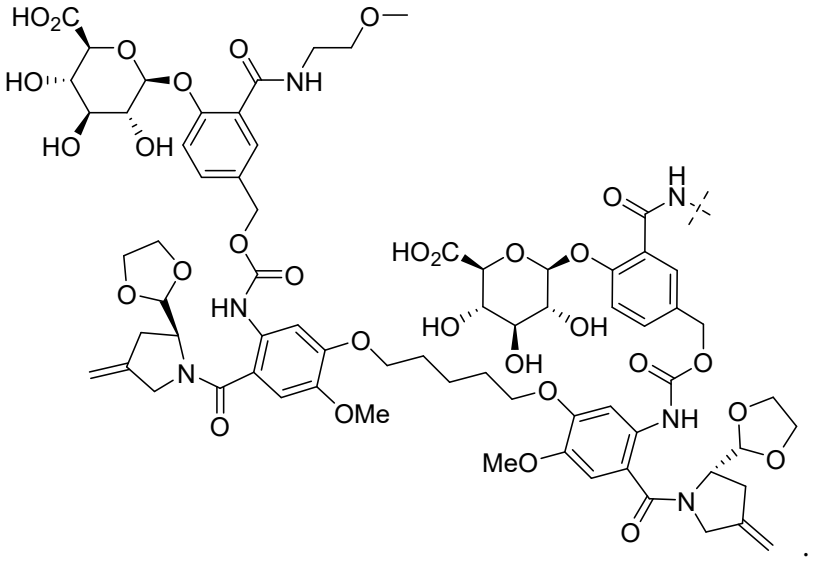






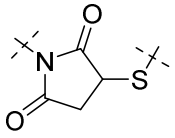


, or

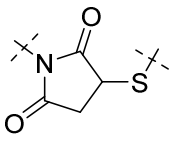


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122. The antibody conjugate of any one of claims 1-10, wherein L further comprises



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123. The antibody conjugate of claim 122, wherein  is a binding moiety.

124. A pharmaceutical composition comprising the antibody conjugate of any one of the preceding claims.

125. The pharmaceutical composition of claim 124, further comprising a therapeutically effective amount of a chemotherapeutic agent.

126. Use of an antibody conjugate of any one of claims 1-123 in the manufacture of a medicament for treating cancer.

127. The use of claim 126, wherein the cancer is selected from leukemia, lymphoma, breast cancer, colon cancer, ovarian cancer, bladder cancer, prostate cancer, glioma, lung cancer, bronchial cancer, colorectal cancer, pancreatic cancer, esophageal cancer, liver cancer, urinary bladder cancer, kidney cancer, renal pelvis cancer, oral cavity cancer, pharynx cancer, uterine corpus cancer, and melanoma.

128. Use of an antibody conjugate of any one of claims 1-123 in the manufacture of a medicament for treating an autoimmune disease or inflammatory disease.

129. The use of claim 128, wherein the autoimmune diseases or the inflammatory disease is selected from B-cell mediated autoimmune diseases or inflammatory diseases, for example, systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), idiopathic thrombocytopenic purpura (ITP), Waldenstrom's hypergammaglobulinaemia, Sjogren's syndrome, multiple sclerosis (MS), and lupus nephritis.