CLAIMS

1. An antibody-drug conjugate comprising an . antibody covalently attached to one or more drug moieties, the antibody-drug conjugate having Formula Ic:

$$Ab-\left(A_a-W_w-Y_y-D\right)_p \qquad \text{Ic}$$

or a pharmaceutically acceptable salt or solvate thereof, wherein:

Ab is an antibody which binds to one or more tumor-associated antigens selected from the group consisting of:

BMPR1B i.e. bone morphogenetic protein receptor-type IB;

E16 i.e. LAT1, SLC7A5;

STEAP1 i.e. six transmembrane epithelial antigen of prostate;

0772P i.e. CA125, MUC16;

MPF i.e. MPF, MSLN, SMR, megakaryocyte potentiating factor, mesothelin;

Napi3b i.e. NAPI-3B, NPTIIb, SLC34A2, solute carrier family 34 sodium phosphate), member 2, type II sodium-dependent phosphate transporter 3b;

Sema 5b i.e. FLJ10372, KIAA1445, Mm.42015, SEMA5B, SEMAG, Semaphorin 5b Hlog, sema domain,; seven thrombospondin repeats i.e. type 1 and type 1-like; transmembrane domain and short cytoplasmic domain, semaphorin 5B;

PSCA hlg i.e. 2700050C12Rik, C530008O16Rik, RIKEN cDNA 2700050C12, RIKEN cDNA 2700050C12 gene;

ETBR i.e. Endothelin type B receptor;

MSG783 i.e. RNF124, hypothetical protein FLJ20315;

STEAP2 i.e. HGNC_8639, IPCA-1, PCANAP1, STAMP1, STEAP2, STMP, prostate cancer associated gene 1, prostate cancer associated protein 1, six transmembrane epithelial antigen of prostate 2, six transmembrane prostate protein;

TrpM4 i.e. BR22450, FLJ20041, TRPM4, TRPM4B, transient receptor potential cation channel, subfamily M, member 4;

CRIPTO i.e. CR, CR1, CRGF, CRIPTO, TDGF1, teratocarcinoma-derived growth factor;

CD21 i.e. Complement receptor 2 or C3d/Epstein Barr virus receptor or Hs.73792 ;

CD79b i.e. immunoglobulin-associated beta, B29;

FcRH2 i.e. IFGP4, IRTA4; SPAP1A i.e. SH2 domain containing phosphatase anchor protein 1a; SPAP1B, SPAP1C;

HER2 ;

NCA ;

MDP ;

IL20Rα ;

Brevican ;

Ephb2R ;

ASLG659 ;

PSCA ;

GEDA ;

BAFF-R ;

CD22 ;

CD79a i.e..CD79A, CD79α, immunoglobulin-associated alpha;

CXCR5 i.e. Burkitt's lymphoma receptor 1;

HLA-DOB i.e. Beta subunit of MHC class II molecule Ia antigen that binds peptides and presents them to CD4+ T lymphocytes;

P2X5 i.e. Purinergic receptor P2X ligand-gated ion channel 5;

CD72 i.e. B-cell differentiation antigen CD72, Lyb-2;

LY64 i.e. Lymphocyte antigen 64 i.e. RP105; type I membrane protein of the leucine rich repeat family;

FCRH1 i.e. Fc receptor-like protein 1; and

IRTA2 i.e. Immunoglobulin superfamily receptor translocation associated 2,

A is a Stretcher unit,

a is 0 or 1,

each W is independently an Amino Acid unit,

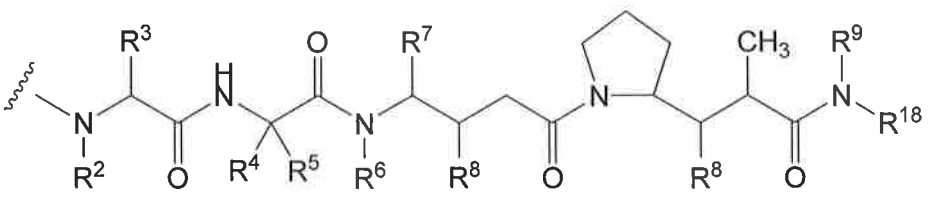
w is an integer ranging from 0 to 12,

Y is a Spacer unit, and

y is 0, 1 or 2,

p ranges from 1 to 20, and

D is a drug moiety having Formulae D_E:



D_E

wherein the wavy line of D_E indicates the covalent attachment site to A, W, or Y, and independently at each location:

R^2 is C_1-C_8 alkyl;

R^3 is C_1-C_8 alkyl;

R^4 is C_1-C_8 alkyl;

R^5 is H;

R^6 is C_1-C_8 alkyl;

R^7 is C_1-C_8 alkyl;

each R^8 is independently O-C_1-C_8 alkyl;

R^9 is H ; and

R^{18} is–$CH(CH_3)$-CH(OH)-phenyl.

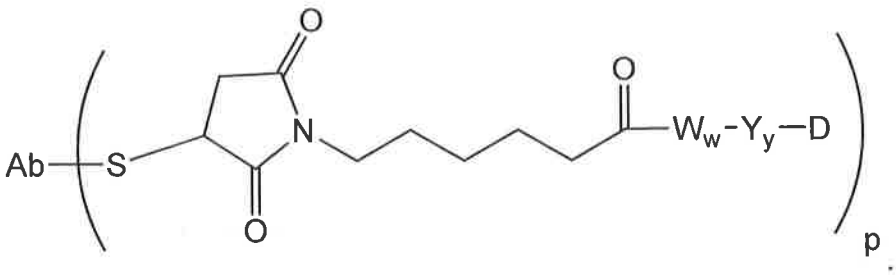
2. The antibody-drug conjugate of claim **1**, wherein the antibody is attached to the drug moiety through a cysteine residue of the antibody.

3. The antibody-drug conjugate of claim **2**, wherein p is 1 to 4.

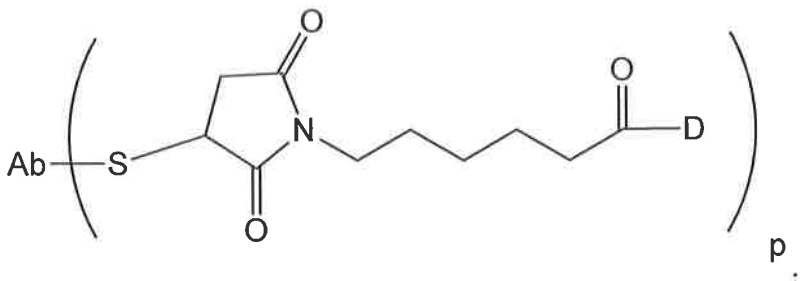
4. The antibody-drug conjugate of claim **1**, wherein p is 2 to 8.

5. The antibody-drug conjugate of claim **1**, wherein p is 2 to 5.

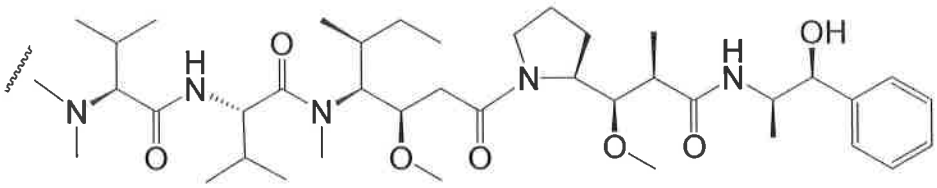
6. The antibody-drug conjugate of claim **2**, having the formula:



7. The antibody-drug conjugate of claim **6**, having the formula:

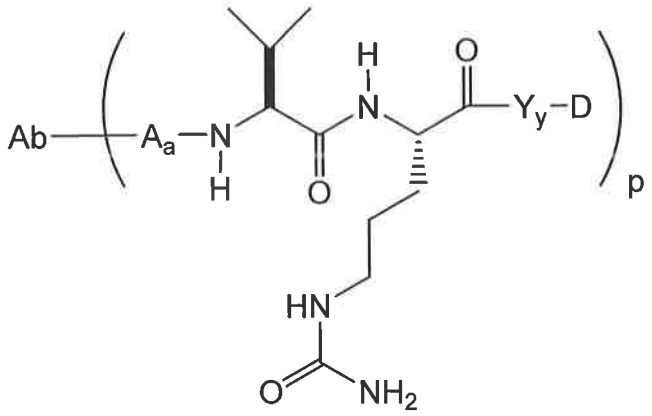


8. The antibody-drug conjugate of claim **7**, wherein D has the formula:

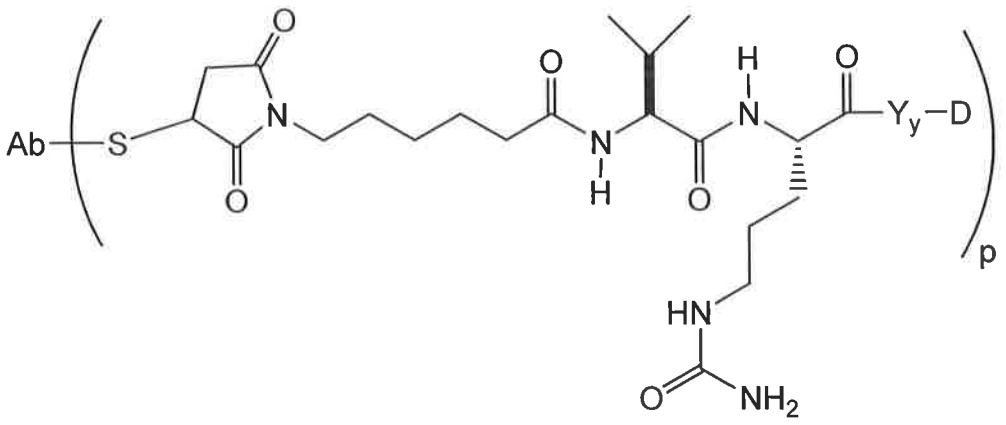


and pharmaceutically acceptable salts and solvates thereof.

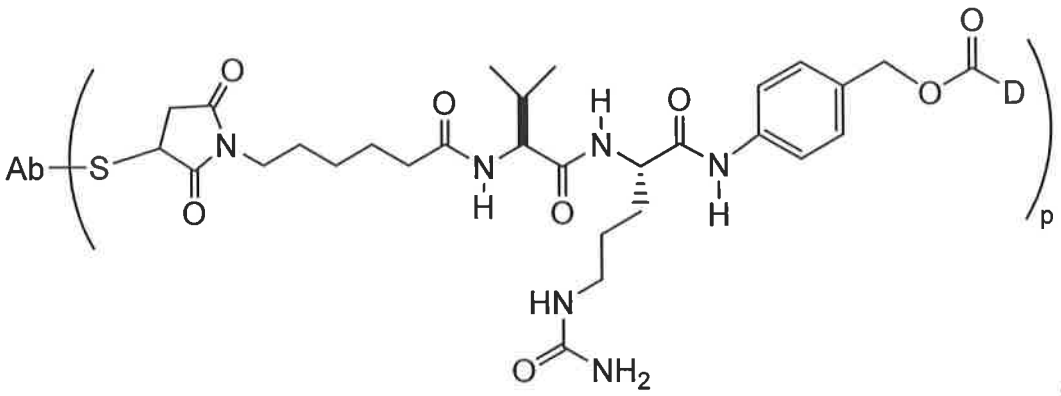
9. The antibody-drug conjugate of claim **1**, having the formula:



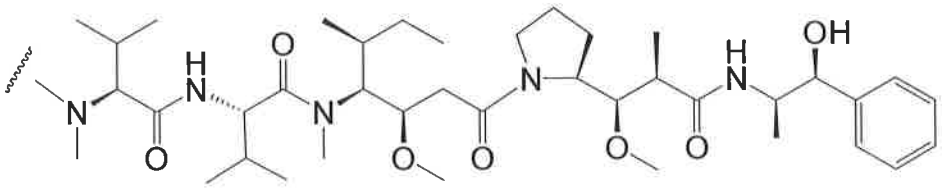
10. The antibody-drug conjugate of claim **9**, having the formula:



11. The antibody-drug conjugate of claim **10**, having the formula:



12. The antibody-drug conjugate of claim **11**, wherein Formula D_E has the formula:



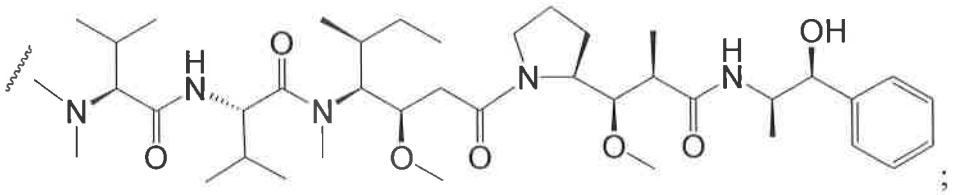
or a pharmaceutically acceptable salt or solvate thereof.

13. The antibody-drug conjugate of claim **1**, wherein w is an integer ranging from 2 to 12.

14. The antibody-drug conjugate of claim **1**, wherein w is 2.

15. The antibody-drug conjugate of claim **1**, wherein W_w is -valine-citrulline-.

16. The antibody-drug conjugate of claim **1**, wherein D is:



;

or a pharmaceutically acceptable salt or solvate thereof.

17. The antibody-drug conjugate of claim **1**, wherein the antibody specifically binds to a HER2 receptor.

18. The antibody-drug conjugate of claim **17**, which specifically binds to the extracellular domain of the HER2 receptor and inhibits growth of tumor cells which overexpress HER2 receptor.

19. The antibody-drug conjugate of claim **1**, wherein the antibody is selected from the group consisting of a monoclonal antibody, a bispecific antibody, a chimeric antibody, a humanized antibody, and an antibody fragment.

20. The antibody-drug conjugate of claim **19**, wherein the antibody fragment is a Fab fragment.

21. The antibody-drug conjugate of claim **19**, wherein the humanized antibody is selected from the group consisting of huMAb4D5-1, huMAb4D5-2, huMAb4D5-3, huMAb4D5-4, huMAb4D5-5, huMAb4D5-6, huMAb4D5-7 and huMAb4D5-8 i.e. trastuzumab.

22. The antibody-drug conjugate of claim **21**, wherein the antibody is huMAb4D5-8 i.e. trastuzumab.

23. A pharmaceutical composition comprising an effective amount of the antibody-drug conjugate of any of claims **1-22**, or a pharmaceutically acceptable salt or solvate thereof, and a pharmaceutically acceptable diluent, carrier or excipient.

24. The pharmaceutical composition of claim **23**, further comprising a therapeutically effective amount of chemotherapeutic agent selected from a tubulin-forming inhibitor, a topoisomerase inhibitor, and a DNA binder.

25. A use of the antibody-drug conjugate of any of claims **1-22**, in the manufacture of a medicament for treating cancer selected from the group consisting of a lymphoma, breast cancer, non-small cell lung cancer and kidney cancer.

26. The use of claim **25**, wherein the cancer is breast cancer.

27. The use of claim **25**, wherein the medicament further comprises an effective amount of an additional anticancer agent, an immunosuppressant agent or an anti-infectious agent.

28. The use of claim **25**, wherein the cancer is a lymphoma.

29. The use of claim **28**, wherein the lymphoma is a non-Hodgkin's Lymphoma.

30. A method of inhibiting cellular proliferation comprising:

exposing mammalian cells in a cell culture medium to the antibody-drug conjugate of any of claims **1-22**, and

measuring a cytotoxic activity of the antibody-drug conjugate,

whereby proliferation of the cells is inhibited.

31. The use of claim **25**, wherein the cancer is kidney cancer.

32. The use of claim **25**, wherein the antibody-drug conjugate specifically binds to a receptor encoded by an ErbB2 gene.

33. The use of claim **25**, wherein said antibody-drug conjugate is formulated with a pharmaceutically acceptable parenteral vehicle.

34. The use of claim **25**, wherein said antibody-drug conjugate is formulated in a unit dosage injectable form.

35. The use of claim **25**, further comprising the administration of a second antibody which binds a tumor-associated antigen selected from:

BMPR1B i.e. bone morphogenetic protein receptor-type IB;

E16 i.e. LAT1, SLC7A5;

STEAP1 i.e. six transmembrane epithelial antigen of prostate;

0772P i.e. CA125, MUC16, Genbank accession no. AF361486;

MPF i.e. MPF, MSLN, SMR, megakaryocyte potentiating factor, mesothelin;

Napi3b i.e. NAPI-3B, NPTIIb, SLC34A2, solute carrier family 34 sodium phosphate), member 2, type II sodium-dependent phosphate transporter 3b

Sema 5b i.e. FLJ10372, KIAA1445, Mm.42015, SEMA5B, SEMAG, Semaphorin 5b Hlog, sema domain,; seven thrombospondin repeats i.e. type 1 and type 1-like; transmembrane domain and short cytoplasmic domain, semaphorin 5B;

PSCA hlg i.e. 2700050C12Rik, C530008O16Rik, RIKEN cDNA 2700050C12, RIKEN cDNA 2700050C12 gene;

ETBR i.e. Endothelin type B receptor;

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TrpM4 i.e. BR22450, FLJ20041, TRPM4, TRPM4B, transient receptor potential cation channel, subfamily M, member 4;

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CD21 i.e. Complement receptor 2 or C3d/Epstein Barr virus receptor or Hs.73792;

CD79b i.e. immunoglobulin-associated beta, B29;

FcRH2 i.e. IFGP4, IRTA4; SPAP1A i.e. SH2 domain containing phosphatase anchor protein 1a; SPAP1B, SPAP1C;

HER2 ;

NCA ;

MDP ;

IL20Rα ;

Brevican ;

Ephb2R ;

ASLG659;

PSCA;

GEDA;

BAFF-R;

CD22 ;

CD79a i.e. CD79A, CD79α, immunoglobulin-associated alpha;

CXCR5 i.e. Burkitt's lymphoma receptor 1;

HLA-DOB i.e. Beta subunit of MHC class II molecule Ia antigen that binds peptides and presents them to CD4+ T lymphocytes;

P2X5 i.e. Purinergic receptor P2X ligand-gated ion channel 5;

CD72 i.e. B-cell differentiation antigen CD72, Lyb-2;

LY64 i.e. Lymphocyte antigen 64 i.e. RP105; type I membrane protein of the leucine rich repeat family;

FCRH1 i.e. Fc receptor-like protein 1; and

IRTA2 i.e. Immunoglobulin superfamily receptor translocation associated 2.

36. The use of claim **35**, wherein said second antibody is conjugated with a cytotoxic agent.

37. The use of claim **25**, further comprising an additional chemotherapeutic agent.

38. An article of manufacture comprising:

an antibody-drug conjugate of any of claims **1-22**,

a container; and

a package insert or label indicating that the antibody-drug conjugate can be used for the detection of cancer cells.

39. The article of manufacture of claim **38**, wherein the cells are breast tumor cells.

40. The article of manufacture of claim **38**, wherein the detection is determined by measuring levels of tumor-associated antigen-encoding nucleic acid by fluorescent *in situ* hybridization.

41. The article of manufacture of claim **38**, wherein the detection is determined by immunohistochemistry.

42. An article of manufacture comprising:

an antibody-drug conjugate of any of claims **1-22**;

a container; and

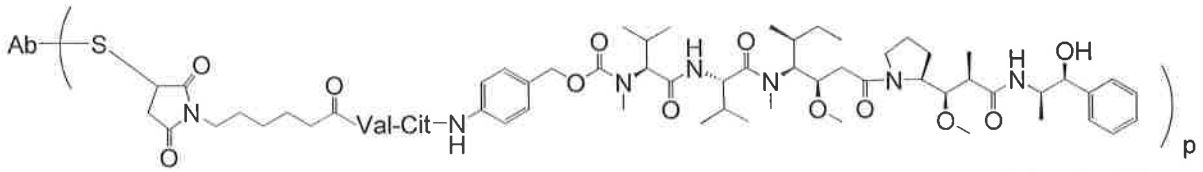
a package insert or label indicating that the antibody-drug conjugate can be used to treat cancer.

43. The article of manufacture of claim **38**, wherein said package insert or label indicates that the antibody-drug conjugate can be used to treat cancer characterized by the overexpression of an ErbB2 receptor.

44. The article of manufacture of claim **38**, wherein the cancer is breast cancer.

45. The use of claim **25**, wherein the cancer is further characterized by the overexpression of an ErbB2 (HER2) receptor and does not respond, or responds poorly, to treatment with an anti-ErbB2 antibody.

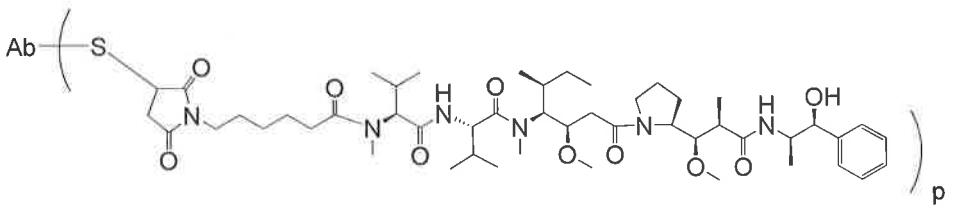
46. The antibody-drug conjugate of claim **1**, having the formula:



Ab-MC-vc-PAB-MMAE;

or a pharmaceutically acceptable salt thereof, wherein Val is valine, and Cit is citrulline.

47. The antibody-drug conjugate of claim **1**, having the formula:



Ab-MC-MMAE.

48. The use of an antibody-drug conjugate of any one of claims **1-22**, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat a hematopoietic cancer.

49. The use of claim **48**, wherein the hematopoietic cancer is Non-Hodgkins lymphoma.

CLAIMS

1. A compound having the formula:

$$L\text{-}(LU\text{-}D_F)_p$$

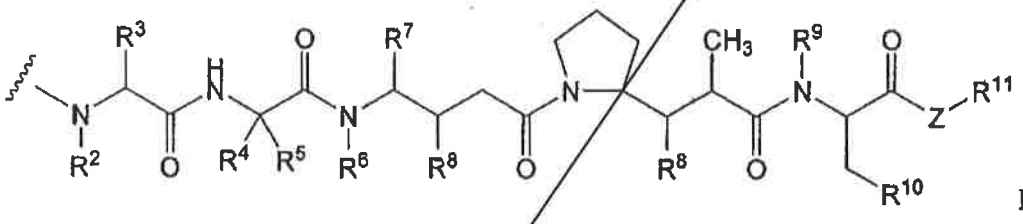
or a pharmaceutically acceptable salt or solvate thereof,

wherein

L- is a Ligand unit selected from the group consisting of a protein, polypeptide and a peptide,

LU is a Linker unit,

D_F has the formula:



D_F

or a pharmaceutically acceptable salt of the compound of formula D_F,

wherein the wavy line of D_F indicates a covalent attachment site, and 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 $-(CR^aR^b)_{n1}-$ 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 n1 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;

R^{10} is selected from the group consisting of aryl and C_3-C_8 heterocycle;

Z is O, S, NH, or NR^{12}, wherein R^{12} is C_1-C_8 alkyl;

R^{11} is selected from the group consisting of H, C_1-C_{20} alkyl, aryl, C_3-C_8 heterocycle, $-(R^{13}O)_m-R^{14}$, and $-(R^{13}O)_m-CH(R^{15})_2$;

m is an integer ranging from 11 to 1000;

R^{13} is C_2-C_8 alkyl;

R^{14} is H or C_1-C_8 alkyl;

each occurrence of R^{15} is independently H, COOH, $-(CH_2)_{n2}-N(R^{16})_2$, $-(CH_2)_{n2}-SO_3H$, or $-(CH_2)_{n2}-SO_3-C_1$-C_8 alkyl;

each occurrence of R^{16} is independently H, C_1-C_8 alkyl, or $-(CH_2)_{n2}-COOH$; and

n2 is an integer ranging from 0 to 6;

p ranges from 1 to about 20;

and the Linker unit can be present or absent.

2. The conjugate of claim 1 having the formula:

$L-(D_F)_p$

or a pharmaceutically acceptable salt or solvate thereof,

wherein

L- is a Ligand unit, and

p ranges from 1 to about 20.

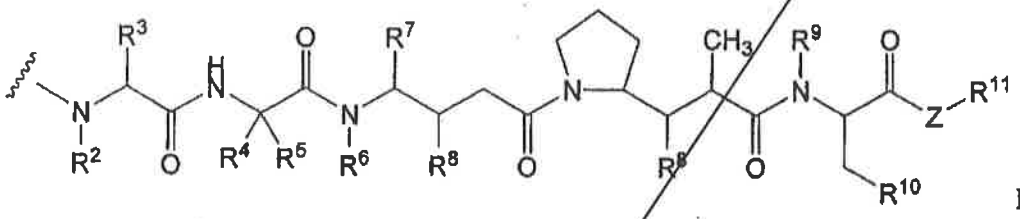
3. A compound having the formula:
LU-D_F

or a pharmaceutically acceptable salt or solvate thereof

wherein

-LU- is a Linker unit; and

D_F has the formula:



D_F

or a pharmaceutically acceptable salt of the compound of formula D_F,

wherein the wavy line of D_F indicates a covalent attachment site, and

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 -$(CR^aR^b)_{n1}$- 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 n1 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;

R^{10} is selected from the group consisting of aryl and C_3-C_8 heterocycle;

Z is O, S, NH, or NR^{12}, wherein R^{12} is C_1-C_8 alkyl;

R^{11} is selected from the group consisting of H, C_1-C_{20} alkyl, aryl, C_3-C_8 heterocycle, $-(R^{13}O)_m-R^{14}$, and $-(R^{13}O)_m-CH(R^{15})_2$;

m is an integer ranging from 11 to 1000;

R^{13} is C_2-C_8 alkyl;

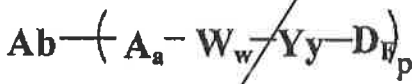
R^{14} is H or C_1-C_8 alkyl;

each occurrence of R^{15} is independently H, COOH, $-(CH_2)_{n2}-N(R^{16})_2$, $-(CH_2)_{n2}-SO_3H$, or $-(CH_2)_{n2}-SO_3-C_1-C_8$ alkyl;

each occurrence of R^{16} is independently H, C_1-C_8 alkyl, or $-(CH_2)_{n2}-COOH$; and

n2 is an integer ranging from 0 to 6.

4. The compound of claim 1, wherein the compound is an antibody-drug conjugate having formula Ia':



Ia'

or a pharmaceutically acceptable salt or solvate thereof, wherein:

Ab is an antibody,

$-A_a-W_w-Y_y-$ comprise a Linker unit,

A is a Stretcher unit,

a is 0 or 1,

each W is independently an Amino Acid unit,

w is an integer ranging from 0 to 12,

Y is a Spacer unit,

y is 0, 1 or 2, and

p ranges from 1 to about 20.

5. The antibody-drug conjugate of claim 4 having the formula:

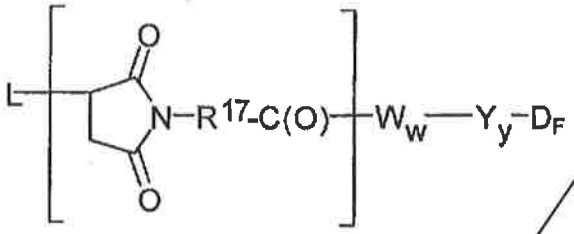
$$\mathbf{Ab\text{-}(D_F)_p}$$

wherein a, w, and y are each 0.

6. The antibody-drug conjugate of claim 4 wherein the antibody is attached to the Linker unit or the drug through a cysteine residue of the antibody.

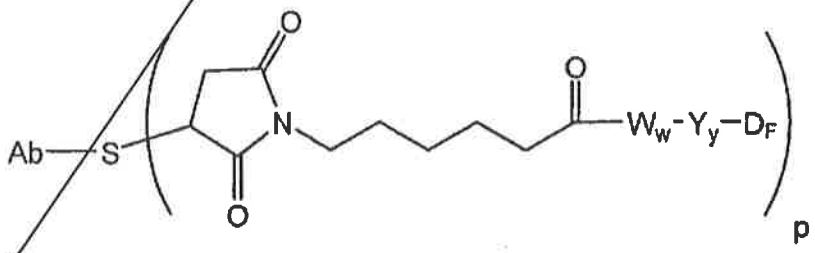
7. The antibody-drug conjugate of claim 6 wherein p is 2 to 5.

8. The antibody-drug conjugate of claim 4 or 6 having the formula:

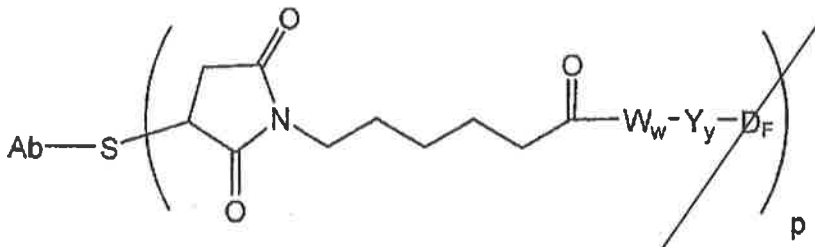


wherein L is an antibody and R^{17} is C_1-C_{10} alkylene-, -C_3-C_8 carbocyclo-, -O-(C_1-C_8 alkyl)-, -arylene-, -C_1-C_{10} alkylene-arylene-, -arylene-C_1-C_{10} alkylene-, -C_1-C_{10} alkylene-(C_3-C_8 carbocyclo)-, -(C_3-C_8 carbocyclo)-C_1-C_{10} alkylene-, -C_3-C_8 heterocyclo-, -C_1-C_{10} alkylene-(C_3-C_8 heterocyclo)-, -(C_3-C_8 heterocyclo)-C_1-C_{10} alkylene-, -$(CH_2CH_2O)_r$-, or -$(CH_2CH_2O)_r$-CH_2-; and r is an integer ranging from 1 to 10.

9. The antibody-drug conjugate of claim 8 having the formula:



10. The antibody-drug conjugate of claim 8 having the formula:



wherein w and y are each 0.

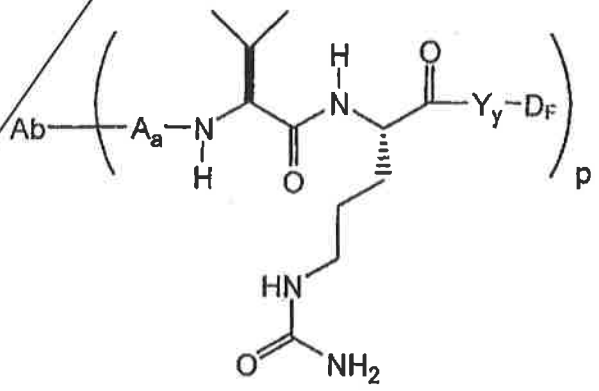
11. The antibody-drug conjugate of claim 4 wherein w is an integer ranging from 2 to 12.

12. The antibody-drug conjugate of claim 11 wherein w is 2.

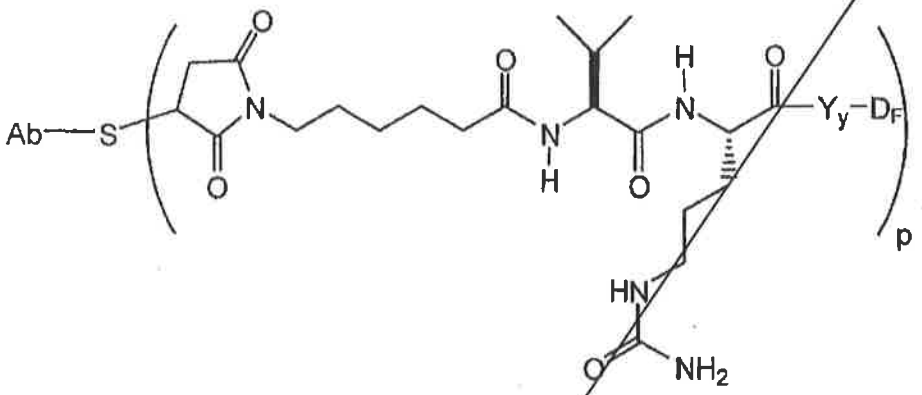
13. The antibody-drug conjugate of claim 12 wherein W_w is -valine-citrulline-, -phenylalanine-lysine-, or -*N*-methyl valine-citrulline-.

14. The antibody-drug conjugate of claim 11 wherein W_w is 5-aminovaleric acid, homo phenylalanine lysine, tetraisoquinolinecarboxylate lysine, cyclohexylalanine lysine, isonepecotic acid lysine, beta-alanine lysine, glycine serine valine glutamine or isonepecotic acid.

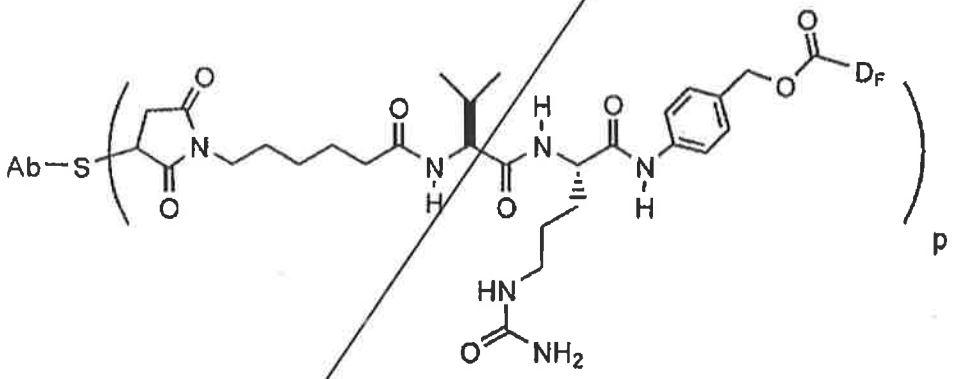
15. The antibody-drug conjugate of claim 13 having the formula:



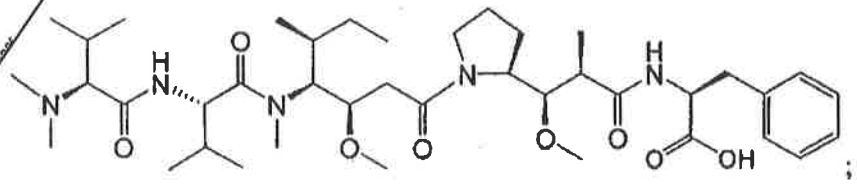
16. The antibody-drug conjugate of claim 13 having the formula:

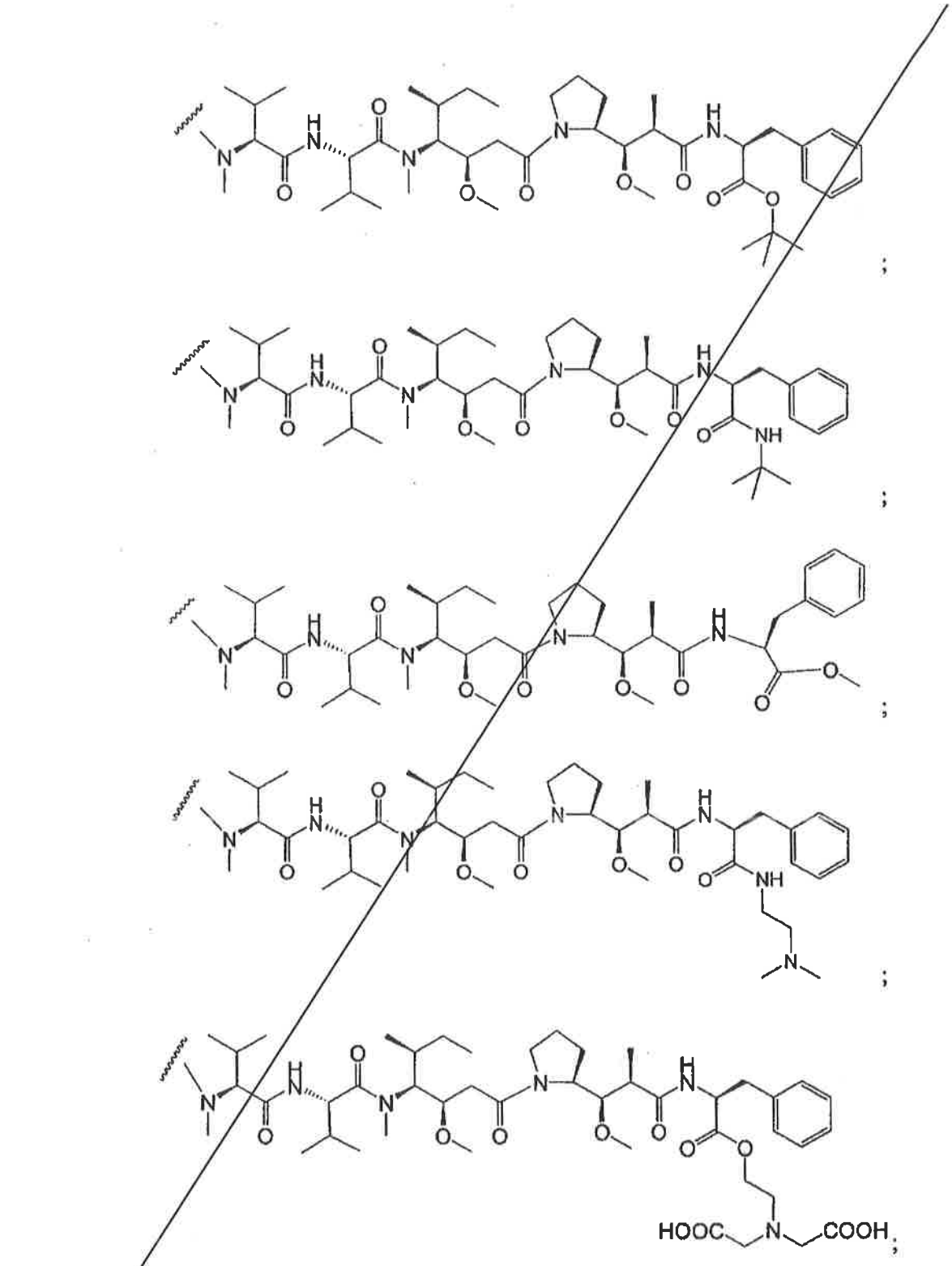


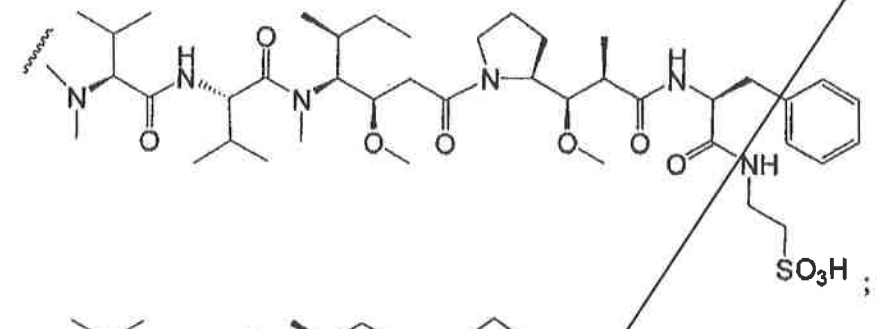
17. The antibody-drug conjugate of claim 13 having the formula:



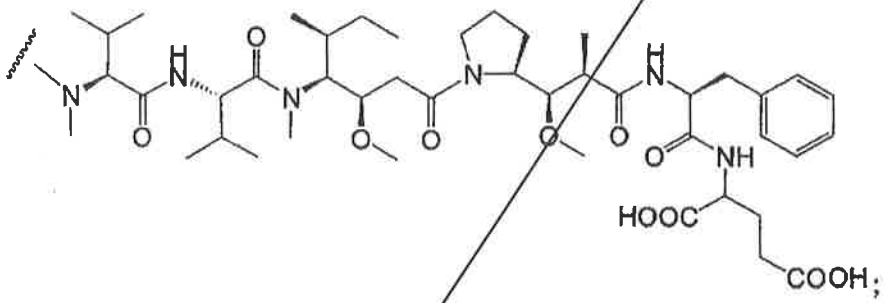
18. The antibody-drug conjugate of any of claims 4-17 wherein D_F has the formula selected from the group consisting of:



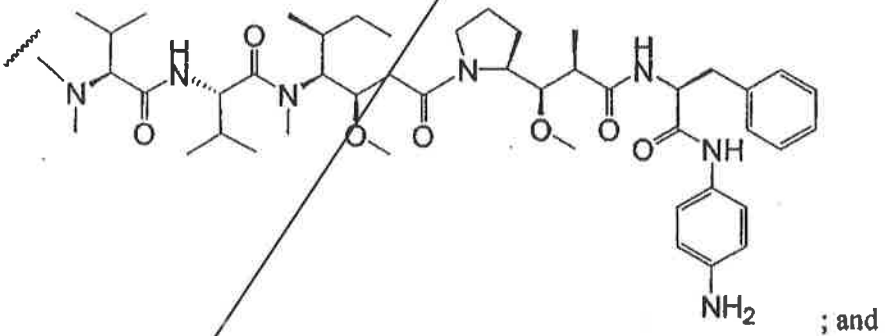




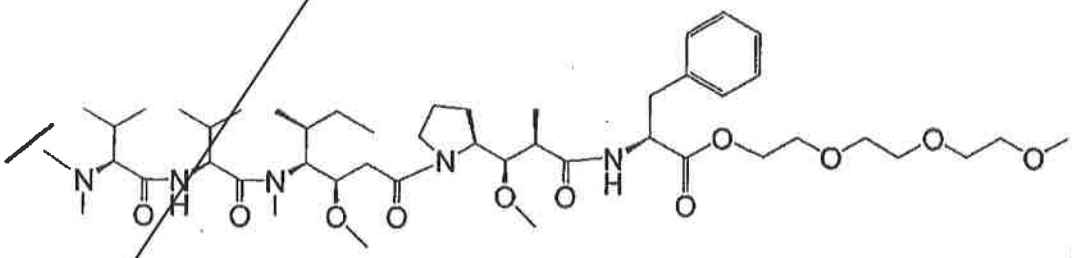
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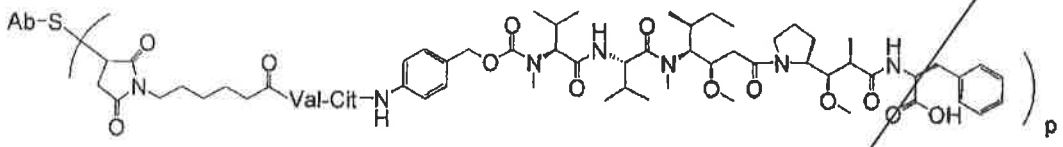


; and



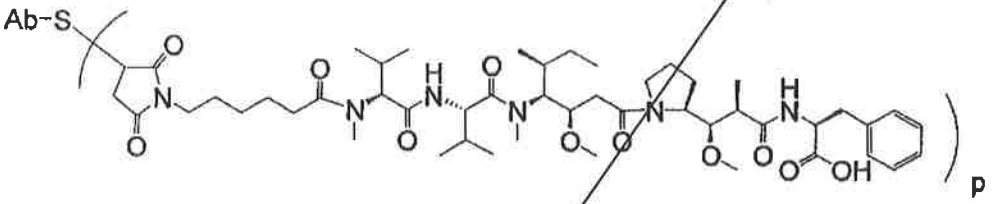
19. The antibody-drug conjugate of claim 4 wherein the antibody is selected from the group consisting of a monoclonal antibody, a bispecific antibody, a chimeric antibody, a humanized antibody, a diabody, and an antibody fragment.

20. The antibody-drug conjugate of claim 4, having the formula:



Ab-MC-vc-PAB-MMAF

or



Ab-MC-MMAF,

wherein Ab is an antibody, Val is valine, and Cit is citrulline.

21. The antibody-drug conjugate of claim 20 wherein the antibody binds to CD30, CD20, CD33, or the Lewis Y antigen.

22. A pharmaceutical composition comprising an effective amount of the conjugate of any of claims 1, 2 or 4-21, or a pharmaceutically acceptable salt or solvate thereof, and a pharmaceutically acceptable diluent, carrier or excipient.

23. The pharmaceutical composition of claim 22 further comprising a therapeutically effective amount of chemotherapeutic agent selected from the group consisting of a tubulin-forming inhibitor, a topoisomerase inhibitor, and a DNA binder.

24. The use of the conjugate of any of claims 1-21, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament.

25. The use of the conjugate of any of claims 1-21, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat a cancer.

26. The use of claim 25 for treatment of cancer with an additional anticancer agent, an immunosuppressant agent or an anti-infectious agent.

27. The use of the conjugate of any of claims 1-21, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat an autoimmune disease.

28. The use of the conjugate of any of claims 1-21, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat an infectious disease.

29. A use of the antibody-drug conjugate of any of claims 4-21, or a pharmaceutically acceptable salt or solvate thereof for the manufacture of a medicament for the treatment of cancer, wherein the antibody of the antibody-drug conjugate binds to an antigen expressed by a cell of the cancer.

30. The use of claim 29, further comprising an effective amount of an additional anticancer agent, an immunosuppressant agent or an anti-infectious agent.

31. A use of the antibody-drug conjugate of any of claims 4-21, or a pharmaceutically acceptable salt or solvate thereof for the manufacture of a medicament for the treatment of an autoimmune disease, wherein the antibody of the antibody-drug conjugate binds to an antigen expressed by a cell of the autoimmune disease.

32. A use of the antibody-drug conjugate of any of claims 4-21, or a pharmaceutically acceptable salt or solvate thereof for the manufacture of a medicament for the treatment of an infectious disease, wherein the antibody of the antibody-drug conjugate binds to an antigen expressed by a cell of the infectious disease.

33. The conjugate of claim 1 or 3, wherein the Linker unit (LU) comprises:

$-A_a-W_w-Y_y-$,

wherein

-A- is a Stretcher unit,

a is 0 or 1,

each -W- is independently an Amino Acid unit,

w is an integer ranging from 0 to 12,

-Y- is a Spacer unit, and

y is 0, 1 or 2.

34. The antibody-drug conjugate of claim 4 or 21 wherein the antibody is an antibody which binds to an ErbB receptor or to one or more of receptors (1)-(35):

(1) BMPR1B (bone morphogenetic protein receptor-type IB, Genbank accession no. NM_001203);

(2) E16 (LAT1, SLC7A5, Genbank accession no. NM_003486);

(3) STEAP1 (six transmembrane epithelial antigen of prostate, Genbank accession no. NM_012449);

(4) 0772P (CA125, MUC16, Genbank accession no. AF361486);

(5) MPF (MPF, MSLN, SMR, megakaryocyte potentiating factor, mesothelin, Genbank accession no. NM_005823);

(6) Napi3b (NAPI-3B, NPTIIb, SLC34A2, solute carrier family 34 (sodium phosphate), member 2, type II sodium-dependent phosphate transporter 3b, Genbank accession no. NM_006424);

(7) Sema 5b (FLJ10372, KIAA1445, Mm.42015, SEMA5B, SEMAG, Semaphorin 5b Hlog, sema domain, seven thrombospondin repeats (type 1 and type 1-like), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 5B, Genbank accession no. AB040878);

(8) PSCA hlg (2700050C12Rik, C530008O16Rik, RIKEN cDNA 2700050C12, RIKEN cDNA 2700050C12 gene, Genbank accession no. AY358628);

(9) ETBR (Endothelin type B receptor, Genbank accession no. AY275463);

(10) MSG783 (RNF124, hypothetical protein FLJ20315, Genbank accession no. NM_017763);

(11) STEAP2 (HGNC_8639, IPCA-1, PCANAP1, STAMP1, STEAP2, STMP, prostate cancer associated gene 1, prostate cancer associated protein 1, six transmembrane epithelial antigen of prostate 2, six transmembrane prostate protein, Genbank accession no. AF455138);

(12) TrpM4 (BR22450, FLJ20041, TRPM4, TRPM4B, transient receptor potential cation channel, subfamily M, member 4, Genbank accession no. NM_017636);

(13) CRIPTO (CR, CR1, CRGF, CRIPTO, TDGF1, teratocarcinoma-derived growth factor, Genbank accession no. NP_003203 or NM_003212);

(14) CD21 (CR2 (Complement receptor 2) or C3DR (C3d/Epstein Barr virus receptor) or Hs.73792 Genbank accession no. M26004);

(15) CD79b (IGb (immunoglobulin-associated beta), B29, Genbank accession no. NM_000626);

(16) FcRH2 (IFGP4, IRTA4, SPAP1A (SH2 domain containing phosphatase anchor protein 1a), SPAP1B, SPAP1C, Genbank accession no. NM_030764);

(17) HER2 (Genbank accession no. M11730);

(18) NCA (Genbank accession no. M18728);

(19) MDP (Genbank accession no. BC017023);

(20) IL20Rα (Genbank accession no. AF184971);

(21) Brevican (Genbank accession no. AF229053);

(22) Ephb2R (Genbank accession no. NM_004442);

(23) ASLG659 (Genbank accession no. AX092328);

(24) PSCA (Genbank accession no. AJ297436);

(25) GEDA (Genbank accession no. AY260763);

(26) BAFF-R (Genbank accession no. NP_443177.1);

(27) CD22 (Genbank accession no. NP-001762.1);

(28) CD79a (CD79A, CD79α, immunoglobulin-associated alpha, Genbank accession No. NP_001774.1);

(29) CXCR5 (Burkitt's lymphoma receptor 1, Genbank accession No. NP_001707.1);

(30) HLA-DOB (Beta subunit of MHC class II molecule (Ia antigen) that binds peptides and presents them to CD4+ T lymphocytes, Genbank accession No. NP_002111.1);

(31) P2X5 (Purinergic receptor P2X ligand-gated ion channel 5, Genbank accession No. NP_002552.2);

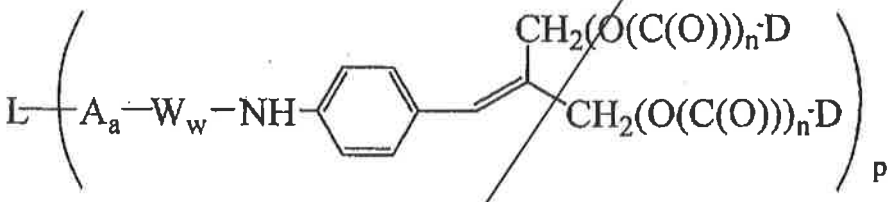
(32) CD72 (B-cell differentiation antigen CD72, Lyb-2, Genbank accession No. NP_001773.1);

(33) LY64 (Lymphocyte antigen 64 (RP105), type I membrane protein of the leucine rich repeat (LRR) family, Genbank accession No. NP_005573.1);

(34) FCRH1 (Fc receptor-like protein 1, Genbank accession No. NP_443170.1); and

(35) IRTA2 (Immunoglobulin superfamily receptor translocation associated 2Genbank accession No. NP_112571.1).

35. A conjugate having the formula:



or a pharmaceutically acceptable salt or solvate thereof,

wherein

L- is a Ligand unit;

-A- is a Stretcher unit;

a is 0 or 1;

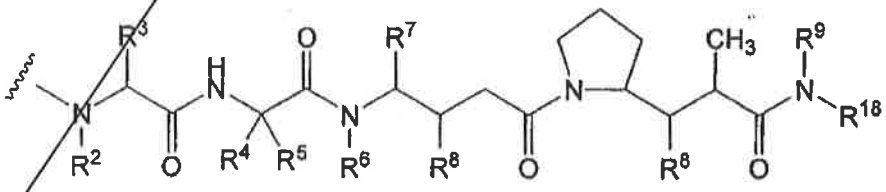
each -W- is independently an Amino Acid unit;

w is an integer ranging from 0 to 12;

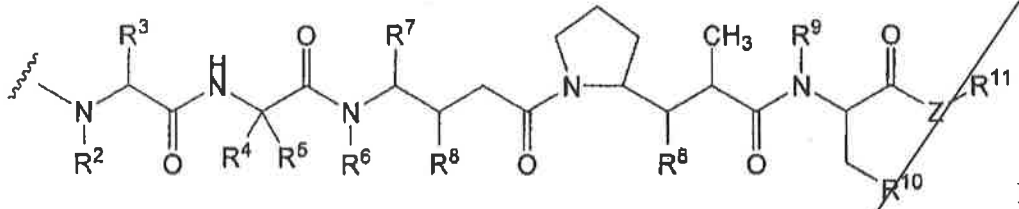
each n3 is independently 0 or 1;

p ranges from 1 to about 20; and

each occurrence of D is independently a drug moiety selected from the group consisting of Formulas D_E and D_F:



D_E



D_F

wherein

at least one D is a drug moiety of Formula D_F and 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 **n1** 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;

R^{10} is selected from the group consisting of aryl and C_3-C_8 heterocycle;

Z is O, S, NH, or NR^{12}, wherein R^{12} is C_1-C_8 alkyl;

R^{11} is selected from the group consisting of H, C_1-C_{20} alkyl, aryl, C_3-C_8 heterocycle, $-(R^{13}O)_m-R^{14}$, and $-(R^{13}O)_m-CH(R^{15})_2$;

m is an integer ranging from 1 to 1000;

R^{13} is C_2-C_8 alkyl;

R^{14} is H or C_1-C_8 alkyl;

each occurrence of R^{15} is independently H, COOH, $-(CH_2)_{n2}$-$N(R^{16})_2$, $-(CH_2)_{n2}$-SO_3H, or $-(CH_2)_{n2}$-SO_3-C_1-C_8 alkyl;

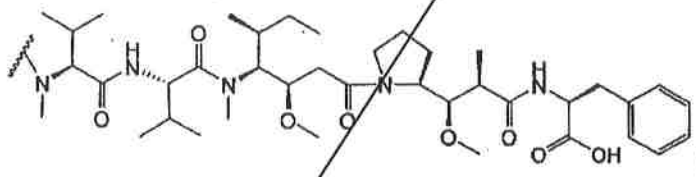
each occurrence of R^{16} is independently H, C_1-C_8 alkyl, or $-(CH_2)_{n2}$-COOH;

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); and

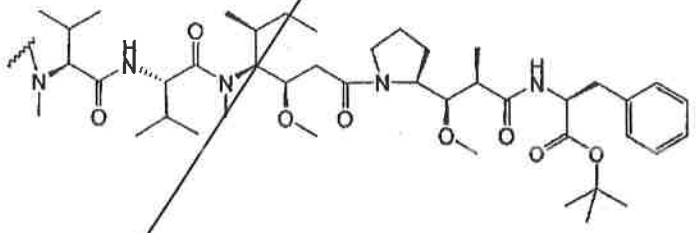
n2 is an integer ranging from 0 to 6.

36. The conjugate of claim 35 wherein w is an integer ranging from 2 to 12.

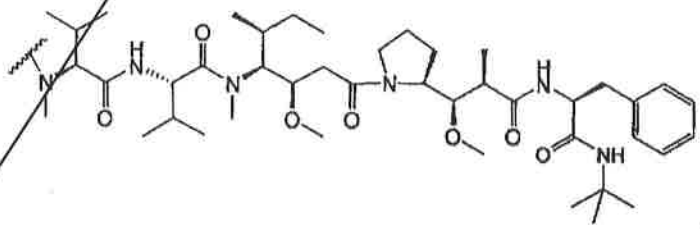
37. The conjugate of claim 35 having the formula D_F selected from the group consisting of:



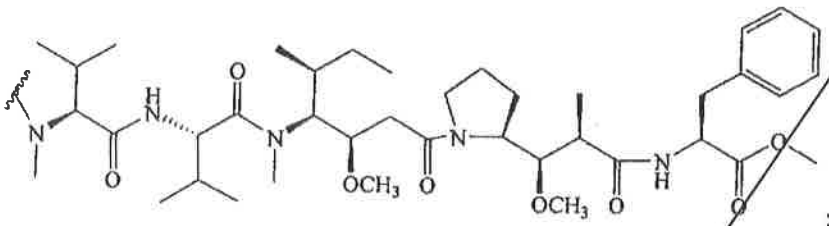
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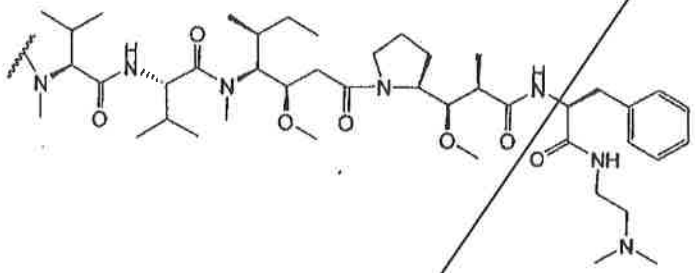


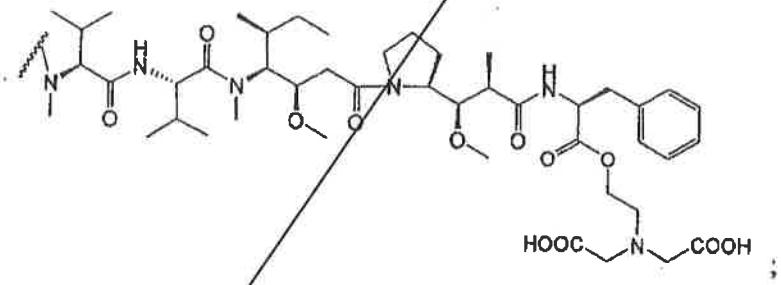
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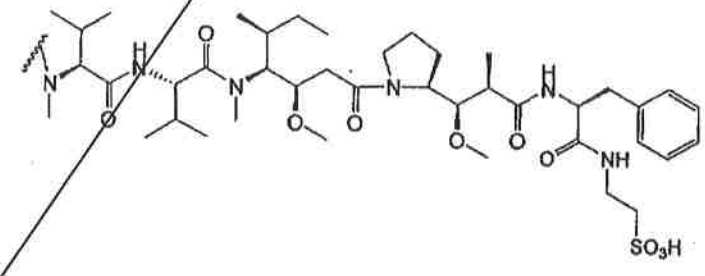


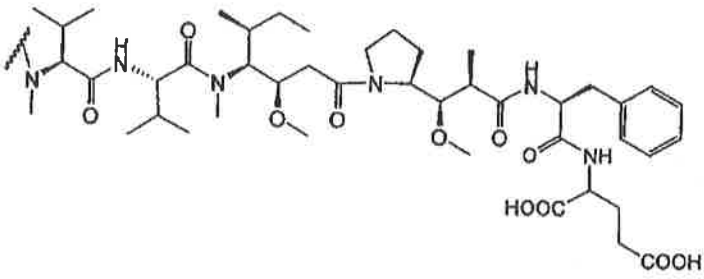
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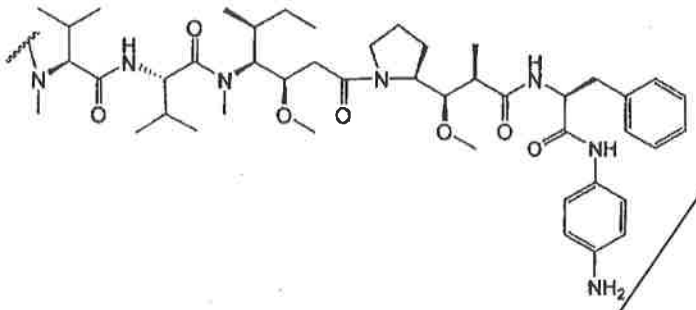

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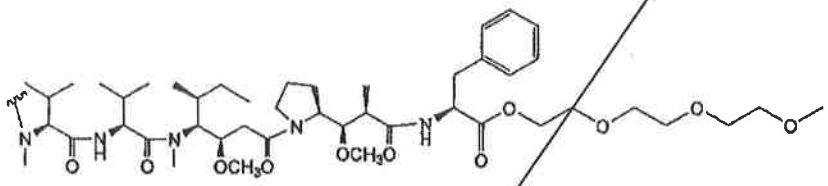

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; and



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or a pharmaceutically acceptable salt or solvate thereof.

38. The conjugate of claim 35, wherein the antibody is an antibody which binds to an ErbB receptor or to one or more of receptors (1)-(35):

(1) BMPR1B (bone morphogenetic protein receptor-type IB, Genbank accession no. NM_001203);

(2) E16 (LAT1, SLC7A5, Genbank accession no. NM_003486);

(3) STEAP1 (six transmembrane epithelial antigen of prostate, Genbank accession no. NM_012449);

(4) 0772P (CA125, MUC16, Genbank accession no. AF361486);

(5) MPF (MPF, MSLN, SMR, megakaryocyte potentiating factor, mesothelin, Genbank accession no. NM_005823);

(6) Napi3b (NAPI-3B, NPTIIb, SLC34A2, solute carrier family 34 (sodium phosphate), member 2, type II sodium-dependent phosphate transporter 3b, Genbank accession no. NM_006424);

(7) Sema 5b (FLJ10372, KIAA1445, Mm.42015, SEMA5B, SEMAG, Semaphorin 5b Hlog, sema domain, seven thrombospondin repeats (type 1 and type 1-like), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 5B, Genbank accession no. AB040878);

(8) PSCA hlg (2700050C12Rik, C530008O16Rik, RIKEN cDNA 2700050C12, RIKEN cDNA 2700050C12 gene, Genbank accession no. AY358628);

(9) ETBR (Endothelin type B receptor, Genbank accession no. AY275463);

(10) MSG783 (RNF124, hypothetical protein FLJ20315, Genbank accession no. NM_017763);

(11) STEAP2 (HGNC_8639, IPCA-1, PCANAP1, STAMP1, STEAP2, STMP, prostate cancer associated gene 1, prostate cancer associated protein 1, six transmembrane epithelial antigen of prostate 2, six transmembrane prostate protein, Genbank accession no. AF455138);

(12) TrpM4 (BR22450, FLJ20041, TRPM4, TRPM4B, transient receptor potential cation channel, subfamily M, member 4, Genbank accession no. NM_017636);

(13) CRIPTO (CR, CR1, CRGF, CRIPTO, TDGF1, teratocarcinoma-derived growth factor, Genbank accession no. NP_003203 or NM_003212);

(14) CD21 (CR2 (Complement receptor 2) or C3DR (C3d/Epstein Barr virus receptor) or Hs.73792 Genbank accession no. M26004);

(15) CD79b (IGb (immunoglobulin-associated beta), B29, Genbank accession no. NM_000626);

(16) FcRH2 (IFGP4, IRTA4, SPAP1A (SH2 domain containing phosphatase anchor protein 1a), SPAP1B, SPAP1C, Genbank accession no. NM_030764);

(17) HER2 (Genbank accession no. M11730);

(18) NCA (Genbank accession no. M18728);

(19) MDP (Genbank accession no. BC017023);

(20) IL20Rα (Genbank accession no. AF184971);

(21) Brevican (Genbank accession no. AF229053);

(22) Eph62R (Genbank accession no. NM_004442);

(23) ASLG659 (Genbank accession no. AX092328);

(24) PSCA (Genbank accession no. AJ297436);

(25) GEDA (Genbank accession no. AY260763);

(26) BAFF-R (Genbank accession no. NP_443177.1);

(27) CD22 (Genbank accession no. NP-001762.1);

(28) CD79a (CD79A, CD79α, immunoglobulin-associated alpha, Genbank accession No. NP_001774.1);

(29) CXCR5 (Burkitt's lymphoma receptor 1, Genbank accession No. NP_001707.1);

(30) HLA-DOB (Beta subunit of MHC class II molecule (Ia antigen) that binds peptides and presents them to CD4+ T lymphocytes, Genbank accession No. NP_002111.1);

(31) P2X5 (Purinergic receptor P2X ligand-gated ion channel 5, Genbank accession No. NP_002552.2);

(32) CD72 (B-cell differentiation antigen CD72, Lyb-2, Genbank accession No. NP_001773.1);

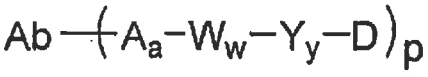
(33) LY64 (Lymphocyte antigen 64 (RP105), type I membrane protein of the leucine rich repeat (LRR) family, Genbank accession No. NP_005573.1);

(34) FCRH1 (Fc receptor-like protein 1, Genbank accession No. NP_443170.1); and

(35) IRTA2 (Immunoglobulin superfamily receptor translocation associated Genbank accession No. NP_112571.1).

39. The conjugate or compound or a pharmaceutically acceptable salt or solvate of the conjugate or compound thereof of any of claims 1-21 and 33-38 that is in isolated and purified form.

40. An antibody-drug conjugate comprising an antibody covalently attached to one or more drug moieties, the antibody-drug conjugate having Formula **Ic**:



Ic

or a pharmaceutically acceptable salt or solvate thereof, wherein:

Ab is an antibody which binds to one or more tumor-associated antigens (1)-(35):

(1) BMPR1B (bone morphogenetic protein receptor-type IB, Genbank accession no. NM_001203);

(2) E16 (LAT1, SLC7A5, Genbank accession no. NM_003486);

(3) STEAP1 (six transmembrane epithelial antigen of prostate, Genbank accession no. NM_012449);

(4) 0772P (CA125, MUC16, Genbank accession no. AF361486);

(5) MPF (MPF, MSLN, SMR, megakaryocyte potentiating factor, mesothelin, Genbank accession no. NM_005823);

(6) Napi3b (NAPI-3B, NPTIIb, SLC34A2, solute carrier family 34 (sodium phosphate), member 2, type II sodium-dependent phosphate transporter 3b, Genbank accession no. NM_006424);

(7) Sema 5b (FLJ10372, KIAA1445, Mm.42015, SEMA5B, SEMAG, Semaphorin 5b Hlog, sema domain, seven thrombospondin repeats (type 1 and type 1-like), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 5B, Genbank accession no. AB040878);

(8) PSCA hlg (2700050C12Rik, C530008O16Rik, RIKEN cDNA 2700050C12, RIKEN cDNA 2700050C12 gene, Genbank accession no. AY358628);

(9) ETBR (Endothelin type B receptor, Genbank accession no. AY275463);

(10) MSG783 (RNF124, hypothetical protein FLJ20315, Genbank accession no. NM_017763);

(11) STEAP2 (HGNC_8639, IPCA-1, PCANAP1, STAMP1, STEAP2, STMP, prostate cancer associated gene 1, prostate cancer associated protein 1, six transmembrane epithelial antigen of prostate 2, six transmembrane prostate protein, Genbank accession no. AF455138);

(12) TrpM4 (BR22450, FLJ20041, TRPM4, TRPM4B, transient receptor potential cation channel, subfamily M, member 4, Genbank accession no. NM_017636);

(13) CRIPTO (CR, CR1, CRGF, CRIPTO, TDGF1, teratocarcinoma-derived growth factor, Genbank accession no. NP_003203 or NM_003212);

(14) CD21 (CR2 (Complement receptor 2) or C3DR (C3d/Epstein Barr virus receptor) or Hs.73792 Genbank accession no. M26004);

(15) CD79b (IGb (immunoglobulin-associated beta), B29, Genbank accession no. NM_000626);

(16) FcRH2 (IFGP4, IRTA4, SPAP1A (SH2 domain containing phosphatase anchor protein 1a), SPAP1B, SPAP1C, Genbank accession no. NM_030764);

(17) HER2 (Genbank accession no. M11730);

(18) NCA (Genbank accession no. M18728);

(19) MDP (Genbank accession no. BC017023);

(20) IL20Rα (Genbank accession no. AF184971);

(21) Brevican (Genbank accession no. AF229053);

(22) Ephb2R (Genbank accession no. NM_004442);

(23) ASLG659 (Genbank accession no. AX092328);

(24) PSCA (Genbank accession no. AJ297436);

(25) GEDA (Genbank accession no. AY260763);

(26) BAFF-R (Genbank accession no. NP_443177.1);

(27) CD22 (Genbank accession no. NP-001762.1);

(28) CD79a (CD79A, CD79α, immunoglobulin-associated alpha, Genbank accession No. NP_001774.1);

(29) CXCR5 (Burkitt's lymphoma receptor 1, Genbank accession No. NP_001707.1);

(30) HLA-DOB (Beta subunit of MHC class II molecule (Ia antigen) that binds peptides and presents them to CD4+ T lymphocytes, Genbank accession No. NP_002111.1);

(31) P2X5 (Purinergic receptor P2X ligand-gated ion channel 5, Genbank accession No. NP_002552.2);

(32) CD72 (B-cell differentiation antigen CD72, Lyb-2, Genbank accession No. NP_001773.1);

(33) LY64 (Lymphocyte antigen 64 (RP105), type I membrane protein of the leucine rich repeat (LRR) family, Genbank accession No. NP_005573.1);

(34) FCRH1 (Fc receptor-like protein 1, Genbank accession No. NP_443170.1); and

(35) IRTA2 (Immunoglobulin superfamily receptor translocation associated 2Genbank accession No. NP_112571.1),

A is a Stretcher unit,

a is 0 or 1,

each W is independently an Amino Acid unit,

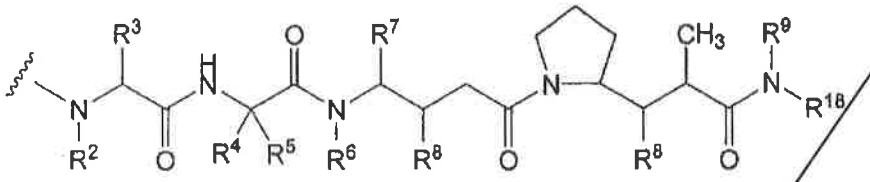
w is an integer ranging from 0 to 12,

Y is a Spacer unit,

y is 0, 1 or 2,

p ranges from 1 to 20, and

D is a drug moiety of Formulae D_E:



D_E

wherein the wavy line of D_E indicates the covalent attachment site to A, W, or Y, and 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 n1 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); and

n2 is an integer ranging from 0 to 6.

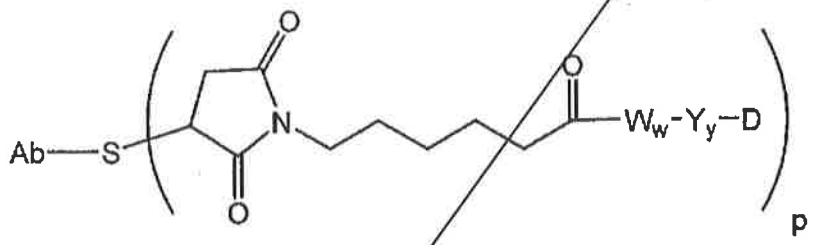
41. The antibody-drug conjugate of claim 40, wherein the antibody is attached to the drug moiety through a cysteine residue of the antibody.

42. The antibody-drug conjugate of claim 41, wherein p is 1 to 4.

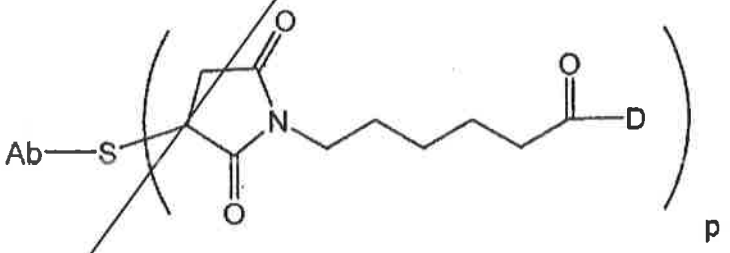
43. The antibody-drug conjugate of claim 40 wherein p is 2 to 8.

44. The antibody-drug conjugate of claim 40 wherein p is 2 to 5.

45. The antibody-drug conjugate of claim 41 having the formula:

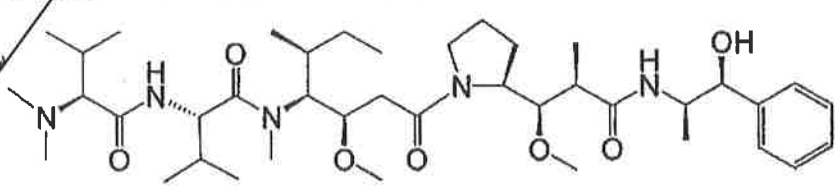


46. The antibody-drug conjugate of claim 45 having the formula:

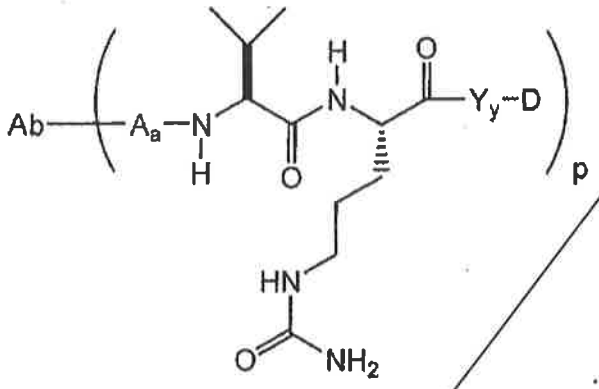


wherein w and y are each 0.

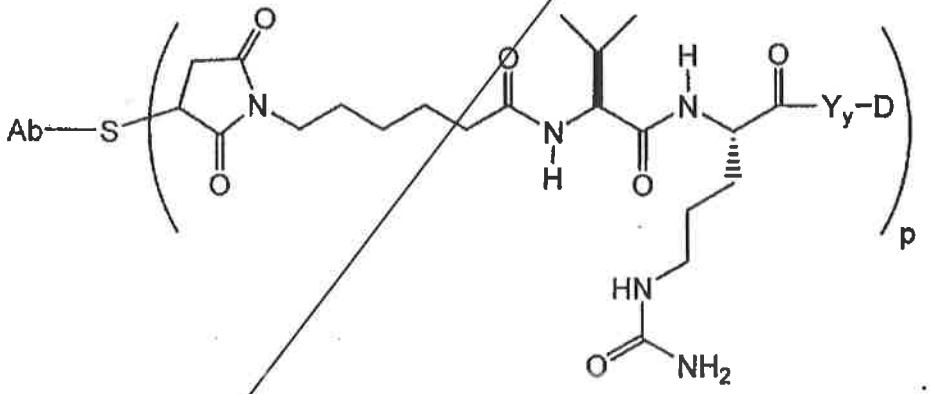
47. The antibody-drug conjugate of claim 45 wherein Formula D_E has the formula:



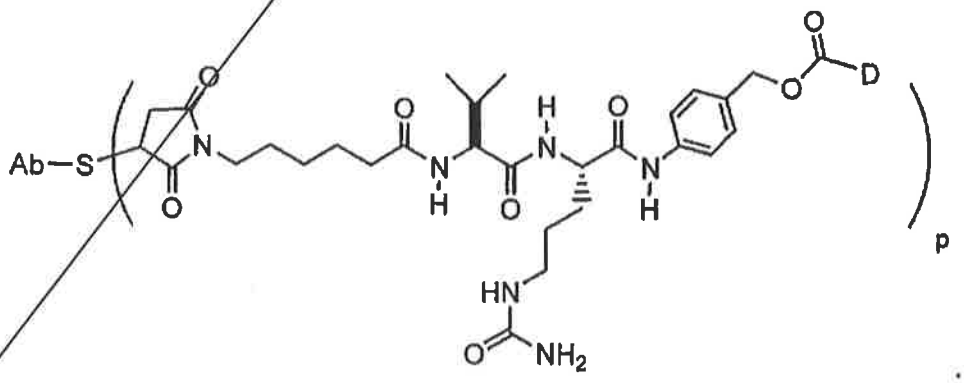
48. The antibody-drug conjugate of claim 40 having the formula:



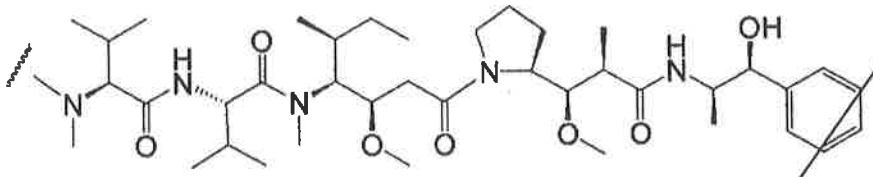
49. The antibody-drug conjugate of claim 48 having the formula:



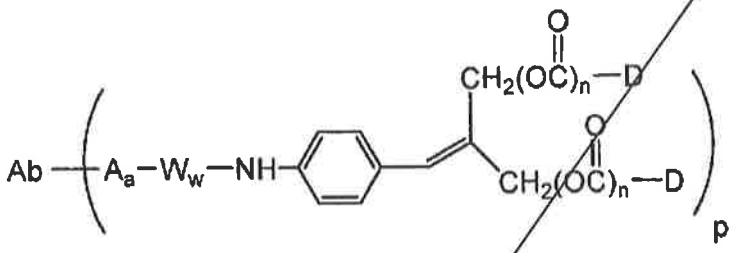
50. The antibody-drug conjugate of claim 49 having the formula:



51. The antibody-drug conjugate of claim 49 wherein Formula $\mathbf{D_E}$ has the formula:



52. The antibody-drug conjugate of claim 40 having the formula:

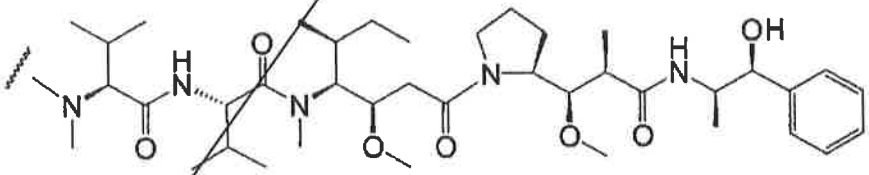


53. The antibody-drug conjugate of claim 40 wherein w is an integer ranging from 2 to 12.

54. The antibody-drug conjugate of claim 40 wherein w is 2.

55. The antibody-drug conjugate of claim 40 wherein W_w is -valine-citrulline- .

56. The antibody-drug conjugate of claim 40 wherein D is of Formulae:



57. The antibody-drug conjugate of claim 40 wherein the antibody specifically binds to a HER2 receptor.

58. The antibody-drug conjugate of claim 57 which specifically binds to the extracellular domain of the HER2 receptor and inhibits growth of tumor cells which overexpress HER2 receptor.

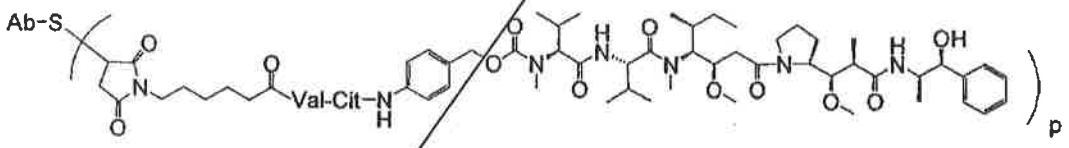
59. The antibody-drug conjugate of claim 40 wherein the antibody is selected from the group consisting of a monoclonal antibody, a bispecific antibody, a chimeric antibody, a humanized antibody, and an antibody fragment.

60. The antibody-drug conjugate of claim 59 wherein the antibody fragment is a Fab fragment.

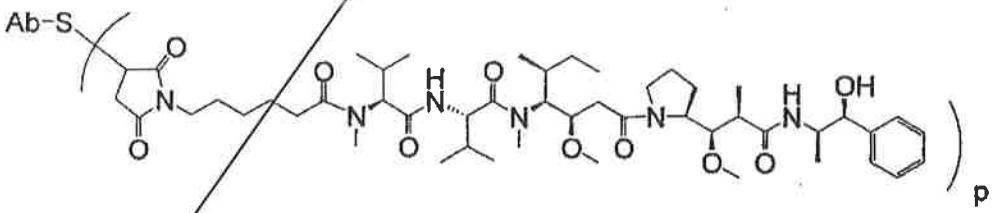
61. The antibody-drug conjugate of claim 59 wherein the humanized antibody is selected from the group consisting of huMAb4D5-1, huMAb4D5-2, huMAb4D5-3, huMAb4D5-4, huMAb4D5-5, huMAb4D5-6, huMAb4D5-7 and huMAb4D5-8 (trastuzumab).

62. The antibody-drug conjugate of claim 61 wherein the antibody is huMAb4D5-8 (trastuzumab).

63. The antibody-drug conjugate of claim 40 selected from the group consisting of formulae:



Ab-MC-vc-PAB-MMAE; and



Ab-MC-MMAE;

wherein Val is valine, and Cit is citrulline.

64. The antibody-drug conjugate of claim 63 wherein the antibody is huMAb4D5-8 (trastuzumab).

65. A pharmaceutical composition comprising an effective amount of the antibody-drug conjugate of claim 40, or a pharmaceutically acceptable salt or solvate thereof, and a pharmaceutically acceptable diluent, carrier or excipient.

66. The pharmaceutical composition of claim 65 further comprising a therapeutically effective amount of chemotherapeutic agent selected from the group consisting of a tubulin-forming inhibitor, a topoisomerase inhibitor, and a DNA binder.

67. A use of the antibody-drug conjugate of claim 40 for the manufacture of a medicament for killing or inhibiting the proliferation of tumor cells or cancer cells.

68. A use of the antibody-drug conjugate of any of claims 40-64 for the manufacture of a medicament for the treatment of a cancer patient with a hyperproliferative disorder.

69. The use of claim 68 wherein the hyperproliferative disorder is cancer selected from the group consisting of breast, ovarian, stomach, endometrial, salivary gland, lung, kidney, colon, colorectal, thyroid, pancreatic, prostate and bladder cancer.

70. The use of claim 68 further comprising an effective amount of an additional agent selected from the group consisting of an anticancer agent, an immunosuppressant agent, and an anti-infectious agent.

71. A use of the antibody-drug conjugate of claim 40 for the manufacture of a medicament for the treatment of an autoimmune disease.

72. A use of the antibody-drug conjugate of claim 40 for the manufacture of a medicament for the treatment of an infectious disease.

73. The use of claim 67 comprising:

exposing mammalian cells in a cell culture medium to the antibody-drug conjugate of claim 40, and

measuring a cytotoxic activity of the antibody-drug conjugate,

whereby proliferation of the cells is inhibited.

74. A use of the antibody-drug conjugate of claim 40 and a pharmaceutically acceptable diluent, carrier or excipient for the manufacture of a medicament for the treatment of cancer.

75. The use of claim 74 wherein the antibody-drug conjugate specifically binds to a receptor encoded by an ErbB2 gene.

76. The use of claim 74 wherein the amount of antibody-drug conjugate administered to the patient is in the range of about 0.1 to about 10 mg/kg of patient weight.

77. The use of claim 74 wherein the antibody-drug conjugate is administered at about three week intervals.

78. The use of claim 74 wherein said antibody-drug conjugate is formulated with a pharmaceutically acceptable parenteral vehicle and administered parenterally.

79. The use of claim 74 wherein said antibody-drug conjugate is formulated in a unit dosage injectable form.

80. The use of claim 74 wherein said antibody-drug conjugate is administered intravenously.

81. The use of claim 74 further comprising the administration of a second antibody which binds a tumor-associated antigen selected from the group consisting of (1)-(35).

82. The use of claim 81 wherein said second antibody is conjugated with a cytotoxic agent.

83. A use of an antibody-drug conjugate of claim 40 which binds specifically to a tumor-associated antigent and a chemotherapeutic agent in the manufacture of a medicament to inhibit the growth of tumor cells that overexpress said tumor-associated antigen.

84. The use of claim 83 wherein said antibody-drug conjugate sensitizes the tumor cells to said chemotherapeutic agent.

85. A use of an effective amount of a combination of an antibody-drug conjugate of claim 40, and a chemotherapeutic agent in the manufacture of a medicament for the treatment of a human patient susceptible to or diagnosed with a disorder characterized by overexpression of ErbB2 receptor.

86. An assay for detecting cancer cells comprising:
exposing cells to an antibody-drug conjugate of claim 40, and
determining the extent of binding of the antibody-drug conjugate to the cells.

87. The assay of claim 86 wherein the cells are breast tumor cells.

88. The assay of claim 86 wherein the extent of binding is determined by measuring levels of tumor-associated antigen-encoding nucleic acid by fluorescent *in situ* hybridization (FISH).

89. The assay of claim 86 wherein the extent of binding is determined by immunohistochemistry (IHC).

90. An article of manufacture comprising:
an antibody-drug conjugate of claim 40;
a container; and
a package insert or label indicating that the antibody-drug conjugate can be used to treat cancer.

91. The article of manufacture of claim 90 wherein said package insert or label indicates that the antibody-drug conjugate can be used to treat cancer characterized by the overexpression of an ErbB2 receptor.

92. The article of manufacture of claim 90 wherein the cancer is breast cancer.

93. A use of a therapeutically effective amount of an antibody-drug conjugate of claim 40 in the manufacture of a medicament for the treatment of cancer in a mammal, wherein the cancer is characterized by the overexpression of an ErbB2 (HER2) receptor and does not respond, or responds poorly, to treatment with an anti-ErbB2 antibody.

94. The use of claim 93 wherein the mammal is human.

95. The use of an antibody-drug conjugate of claim 40, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament.

96. The use of an antibody-drug conjugate of claim 40, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to kill or inhibit the proliferation of tumor cells or cancer cells.

97. The use of an antibody-drug conjugate of claim 40, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat a hyperproliferative disorder.

98. The use of claim 97 wherein the hyperproliferative disorder is cancer selected from the group consisting of breast, ovarian, stomach, endometrial, salivary gland, lung, kidney, colon, colorectal, thyroid, pancreatic, prostate and bladder cancer.

99. The use of claim 97 wherein the medicament further comprises an additional agent selected from an anticancer agent, an immunosuppressant agent, and an anti-infectious agent.

100. The use of an antibody-drug conjugate of claim 40, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat an autoimmune disease.

101. The use of an antibody-drug conjugate of claim 40, or a pharmaceutically acceptable salt or solvate thereof, in the manufacture of a medicament to treat an infectious disease.