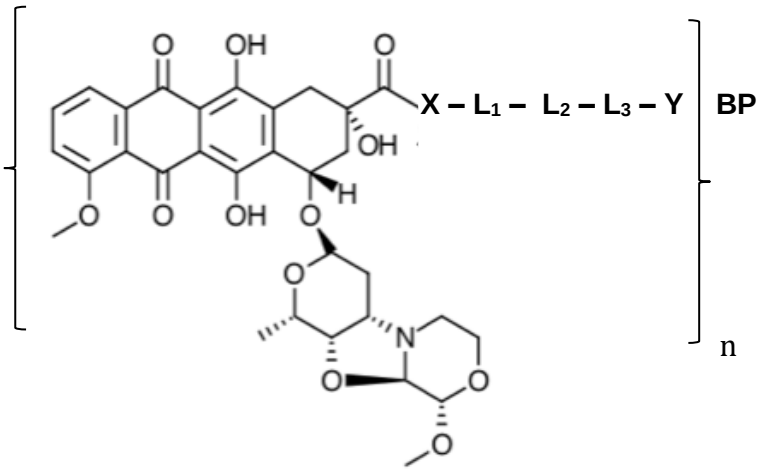
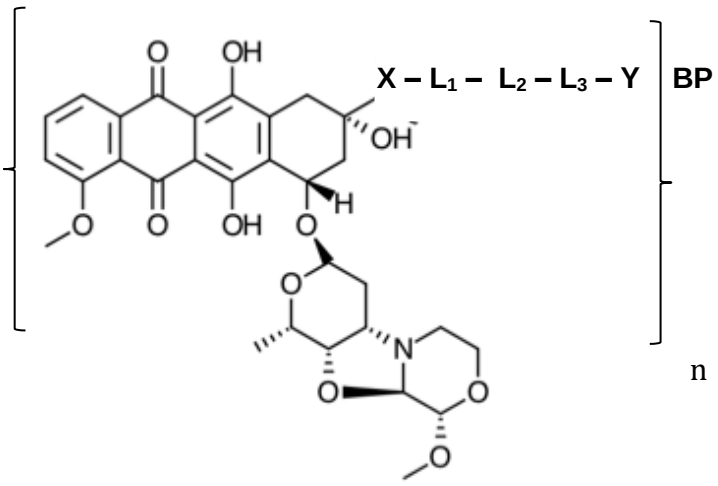
What is claimed is:

1. A binding protein-drug conjugate (BPDC) comprising an anthracycline (PNU) derivative, the BPDC having the following formula:



formula (iii)

or



formula (iv)

wherein

a) each of L_1 - L_3 represents a linker, wherein L_1 is optional and both L_2 and L_3 are mandatory,

clean copy of amended claims 120619

b) L_1 when present, represents an alkylene-amino linker or an alkylene-diamino linker,

c) L_2 represents an oligo-glycine peptide,

d) L_3 represents a peptide motif that results from specific cleavage of a sortase enzyme recognition motif,

e) X and Y each represent one or more optional linkers,

f) BP is a binding protein, and

g) n is an integer ≥ 1 and ≤ 10.

2. The binding protein-drug conjugate according to claim 1, wherein the oligo: glycine peptide is conjugated to the anthracycline derivative by means of an ethylenediamino linker (EDA), designated as L_1, which ethylenediamino linker is conjugated to the anthracycline derivative by means of a first amide bond, while it is conjugated to the carboxy terminus of the oligo-glycine peptide by means of a second amide bond.

3. The binding protein-drug conjugate according to claim 1, wherein said sortase enzyme recognition motif comprises a pentapeptide.

4. The binding protein-drug conjugate according to claim 1, wherein said sortase enzyme recognition motif comprises at least one amino acid sequence selected from the group consisting of (N-terminal to C-terminal)

- LPXTG (SEQ ID NO:5),
- LPXSG (SEQ ID NO:6), and
- LAXTG (SEQ ID NO:7), wherein X in each of SEQ ID NOs 5-7 represents any amino acid.

5. The binding protein-drug conjugate according to claim 1, wherein the anthracycline (PNU) derivative is conjugated, by means of the two or more linkers, to the carboxy terminus of the binding protein, or to the carboxy terminus of at least one domain or subunit thereof.

6. The binding protein-drug conjugate according to claim 1, wherein the binding protein is at least one selected from the group consisting of an antibody, modified antibody format, antibody derivative or fragment, antibody-based binding protein, oligopeptide binder and an antibody mimetic.

7. The binding protein-drug conjugate according to claim 1, wherein the binding protein binds at least one entity selected from the group consisting of

- a receptor
- an antigen
- a growth factor,
- a cytokine, and
- a hormone.

8. The binding protein-drug conjugate according to claim 1, wherein the binding protein comprises at least two subunits.

9. The binding protein-drug conjugate according to claim 8, wherein at least one subunit comprises the anthracycline derivative.

10. The binding protein-drug conjugate according to claim 1, wherein the binding protein binds HER-2.

11. The binding protein-drug conjugate according to claim 10, wherein the binding protein is an antibody that binds HER-2.

12. The binding protein-drug conjugate according to claim 11, wherein the antibody comprises the CDR regions 1 – 6 of trastuzumab.

13. The binding protein-drug conjugate according to claim 11, wherein the antibody comprises the heavy chain variable domain and the light chain variable domain of trastuzumab.

14. The binding protein-drug conjugate according to claim 11, wherein the antibody has an amino acid sequence identity of 90% or higher with the heavy chain variable domain or the light chain variable domain of trastuzumab.

15. The binding protein-drug conjugate according to claim 11, wherein the antibody competes with trastuzumab for binding to HER2.

16. The binding protein-drug conjugate according to claim 1, wherein the binding protein binds CD30.

17. The binding protein-drug conjugate according to claim 16, wherein the binding protein is an antibody that binds CD30.

18. The binding protein-drug conjugate according to claim 17, wherein the antibody comprises the CDR regions 1 – 6 of brentuximab.

19. The binding protein-drug conjugate according to claim 17, wherein the antibody comprises the heavy chain variable domain and the light chain variable domain of brentuximab.

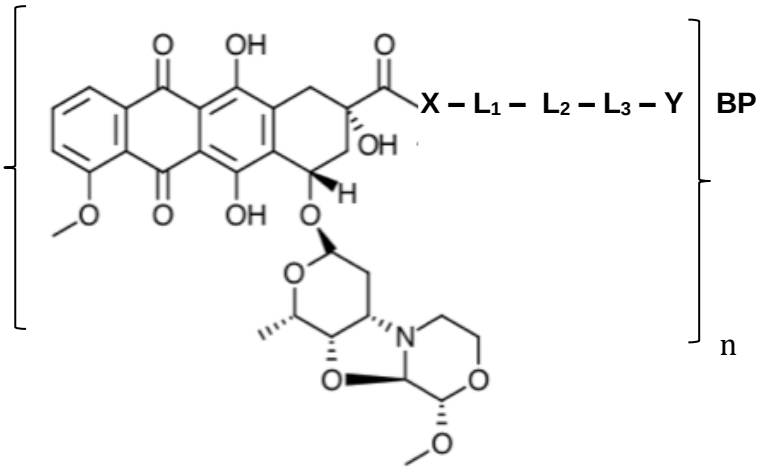
20. The binding protein-drug conjugate according to claim 17, wherein the antibody has an amino acid sequence identity of 90% or higher with the heavy chain variable domain or the light chain variable domain of brentuximab.

21. The binding protein-drug conjugate according to claim 17, wherein the antibody competes with brentuximab for binding to CD30.

22. A pharmaceutical composition comprising the binding protein drug conjugate according to claim 1, and at least one other pharmaceutically acceptable ingredient.

23. The binding protein drug conjugate according to claim l, wherein the binding protein is an antibody.

24. A binding protein-drug conjugate (BPDC) comprising an anthracycline (PNU) derivative, the BPDC having the following formula:



formula (iii)

wherein

a) X is absent,

b) L_1 represents ethylenediamine (EDA),

c) L_2 represents an oligo-glycine peptide $(Gly)_P$, wherein p is an integer ≥ 1 and ≤ 21,

d) L_3 consists of amino acid residues 1-4 of a processed sortase enzyme recognition motif (N-terminal to C-terminal) Leu-Pro-Xaa-Thr-Gly (LPXTG) (SEQ ID NO: 5, wherein Xaa is any amino acid),

e) Y, when present, is (N-terminal to C-terminal) Gly-Gly-Gly-Gly-Ser (G_4S) (SEQ ID NO: 8),

f) BP is an IgG antibody, and

g) n is an integer ≥ 1 and ≤ 10.

25. The binding protein conjugate according to claim 24, wherein the N-terminal Gly of Y is linked to the last C-terminal Cys amino acid of at least one light chain of the antibody.

26. The binding protein-drug conjugate according to claim 24, wherein the antibody comprises the heavy chain variable domain and the light chain variable domain of trastuzumab.

27. The binding protein-drug conjugate according to claim 24, wherein the antibody has an amino acid sequence identity of 90% or higher with the heavy chain variable domain or the light chain variable domain of trastuzumab.

28. The binding protein-drug conjugate according to claim 24, wherein the antibody competes with trastuzumab for binding to HER2.