

CLAIMS

1. A humanized antibody targeting c-Met or antigen-binding fragment thereof, comprising a heavy chain variable region and a light chain variable region, wherein:

5 (1) the heavy chain variable region has CDRs 1-3 set forth in SEQ ID NOs: 1-3 respectively determined by Kabat method; and

(2) the light chain variable region has CDRs 1-3 set forth in SEQ ID NOs: 4-6 respectively determined by Kabat method.

10 2. The antibody or antigen-binding fragment thereof according to claim 1, wherein the humanized antibody or antigen-binding fragment thereof is selected from the group consisting of monoclonal antibody, bispecific antibody, multispecific antibody, recombinant protein comprising the antigen-binding fragment, Fab fragment, F(ab') fragment, F(ab')₂ fragment, Fv fragment, and single chain antibody (scFv).

15 3. The antibody or antigen-binding fragment thereof according to claim 1, further comprising a constant region of an immunoglobulin, wherein the immunoglobulin is selected from the group consisting of IgG1, IgG2, IgG3 and IgG4.

20 4. The antibody or antigen-binding fragment thereof according to claim 1, wherein:

(1) the heavy chain variable region has an amino acid sequence shown in SEQ ID NO: 7; and

(2) the light chain variable region has an amino acid sequence shown in SEQ ID NO: 8.

25 5. The antibody or antigen-binding fragment thereof according to claim 4, wherein the humanized antibody targeting c-Met comprises a heavy chain and a light chain, and

(1) the heavy chain has an amino acid sequence shown in SEQ ID NO: 9; and

(2) the light chain has an amino acid sequence shown in SEQ ID NO:10.

6. An isolated polynucleotide encoding the antibody or antigen-binding fragment thereof according to claims 1-5.

5

7. A nucleic acid construct comprising the polynucleotide according to claim 6.

8. The nucleic acid construct according to claim 7, wherein the nucleic acid construct is an expression vector, and the polynucleotide is operably linked to a regulatory sequence that permits
10 expression of a polypeptide encoded by the polynucleotide in a host cell or cell-free expression system.

9. A host cell comprising the polynucleotide according to claim 6 or the nucleic acid construct according to claim 7 or 8, wherein the host cell is preferably selected from the group
15 consisting of a prokaryotic cell, eukaryotic cell, yeast cell, mammalian cell and E. coli cell; and more preferably, the host cell is selected from the group consisting of a CHO cell, NS0 cell, Sp2/0 cell and BHK cell.

10. A method for producing the antibody or antigen-binding fragment thereof according to
20 any one of claims 1 to 5, comprising culturing the host cell according to claim 9 under a condition allowing the expression of the nucleic acid construct according to claim 8, and recovering the produced expressed protein from the culture.

11. An antibody-drug conjugate targeting c-Met, comprising the antibody or antigen-binding
25 fragment thereof according to any one of claims 1 to 5 coupled with one or more therapeutic agents.

12. The antibody-drug conjugate according to claim 11, wherein the therapeutic agent is selected from the group consisting of a cytotoxic molecule, immunoenhancer and radioisotope, the cytotoxic molecule is selected from the group consisting of a tubulin inhibitor and a DNA damage agent; further preferably, the tubulin inhibitor is selected from the group consisting of a cytotoxic molecule of dolastatins and auristatins and a cytotoxic molecule of maytansines; the DNA damaging agent is selected from the group consisting of calicheamicins, duocarmycins, pyrrolobenzodiazepines (PBD), camptothecins, SN-38 and Dxd; more preferably, the cytotoxic molecule of auristatins is selected from the group consisting of MMAE and MMAF, , and the cytotoxic molecule of maytansines is selected from the group consisting of DM1 and DM4.

13. The antibody-drug conjugate according to claim 12, wherein the antibody-drug conjugate has a structural formula of A-(L-U)_n, wherein A represents the antibody or antigen-binding fragment thereof according to any one of claims 1 to 5; U is an active drug unit; L is any linking group, and L is covalently linked to A and U, respectively; n is an integer selected from 1, 2, 3, 4, 5, 6, 7 or 8; and A is linked to 1, 2, 3, 4, 5, 6, 7 or 8 of U through one or more L.

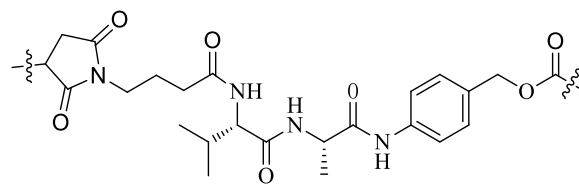
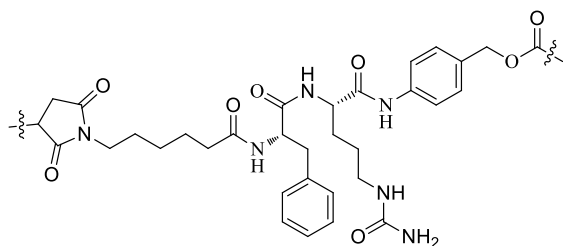
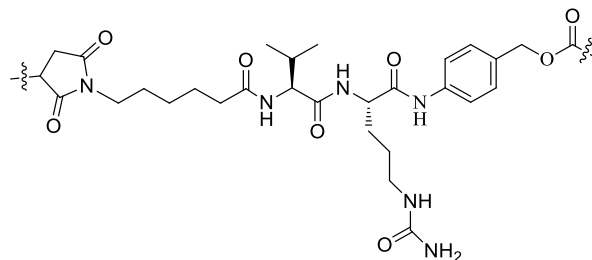
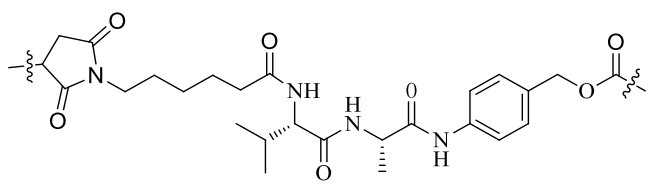
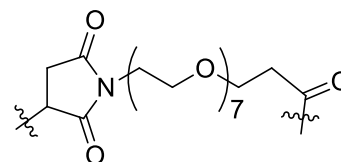
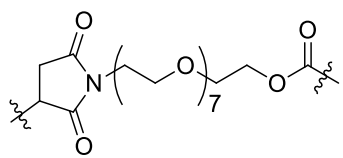
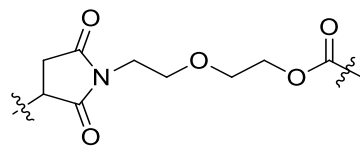
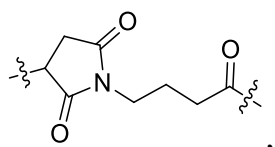
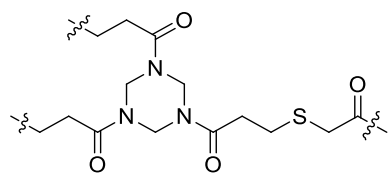
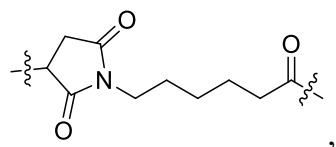
14. The antibody-drug conjugate according to claim 13, wherein L is covalently linked to the amino residue or thiol residue on A; preferably, L is covalently linked to the thiol residue on A; more preferably, L is covalently linked to the thiol residue formed after the interchain disulfide bond on A is opened.

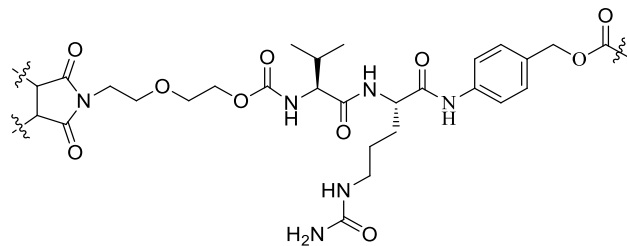
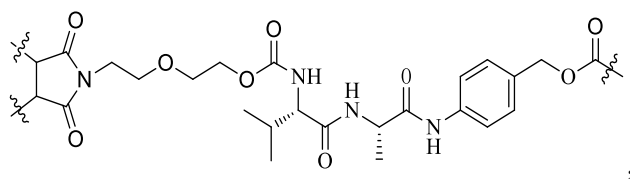
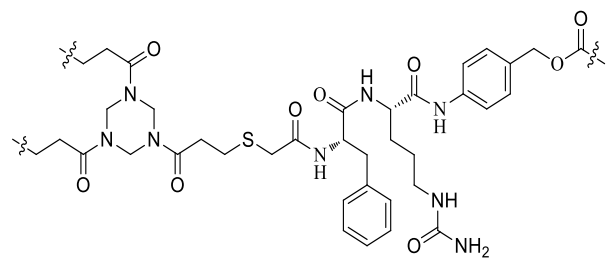
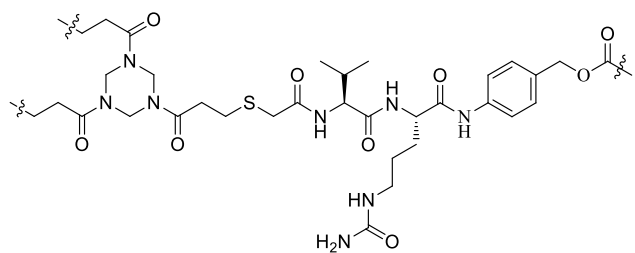
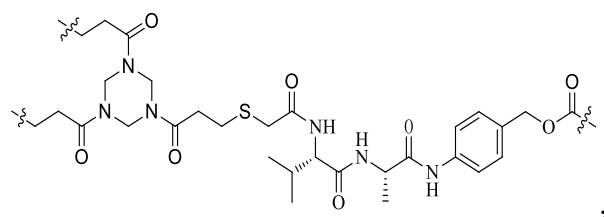
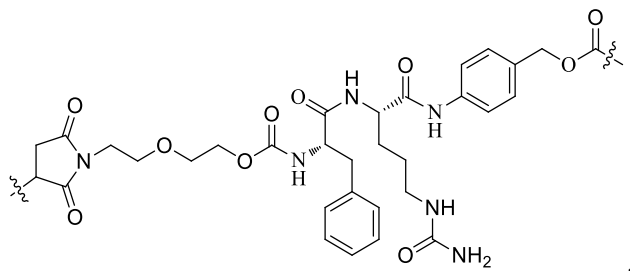
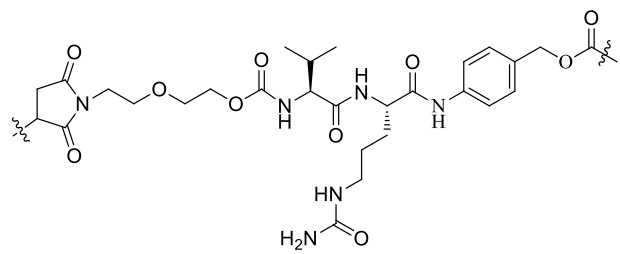
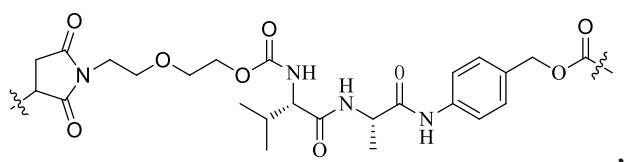
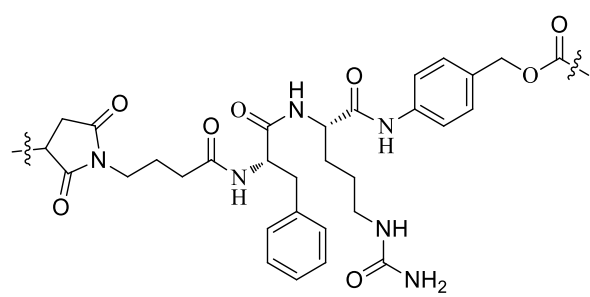
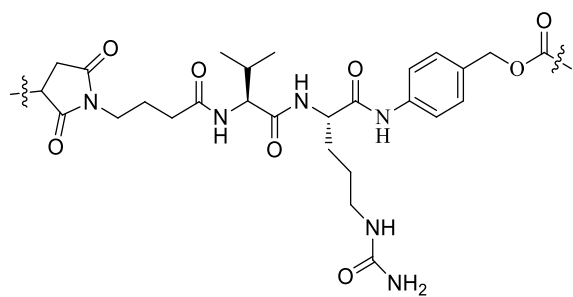
15. The antibody-drug conjugate according to claim 14, wherein L comprises a cleavable linker or a non-cleavable linker.

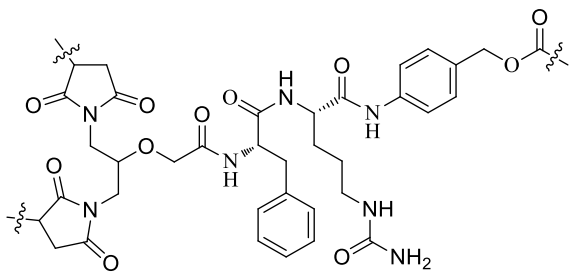
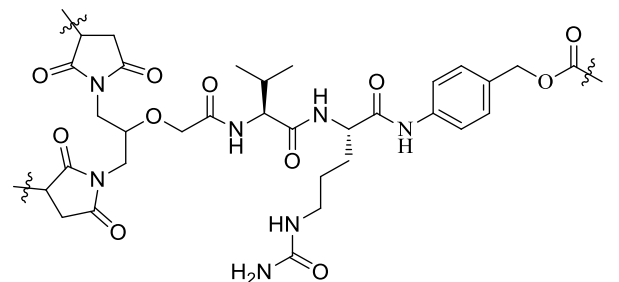
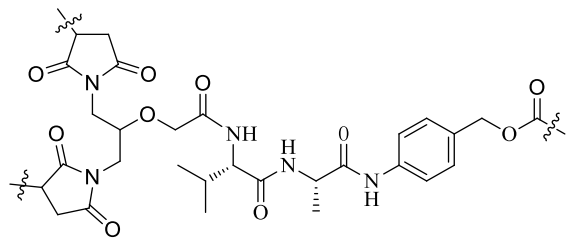
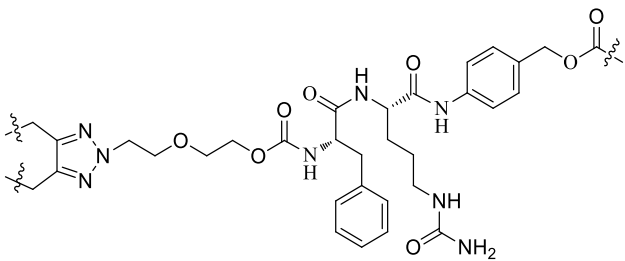
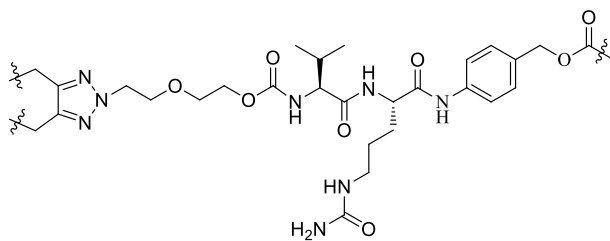
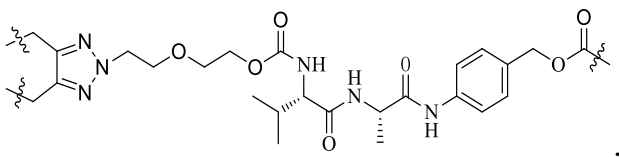
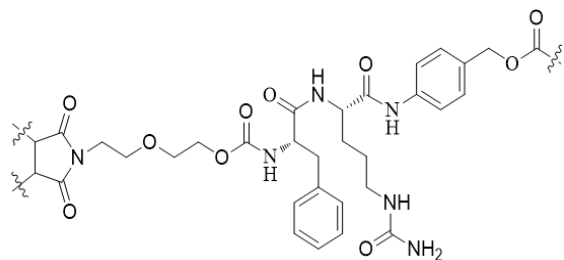
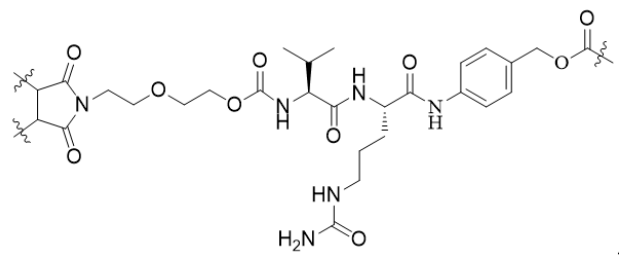
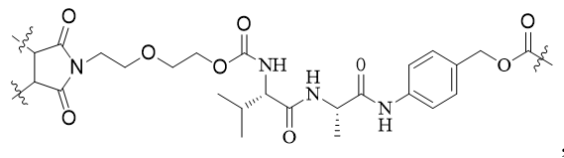
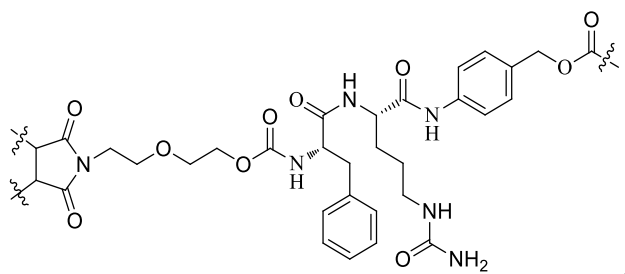
16. The antibody-drug conjugate according to claim 15, wherein the cleavable linker comprises a peptide unit comprising 2-20 amino acids, and preferably, the peptide unit is selected from the group consisting of -valine-citrulline- (-Val-Cit-), -glycine-glycine-phenylalanine-glycine- (-Gly-Gly-Phe-Gly-), -valine-alanine- (-Val-Ala-),

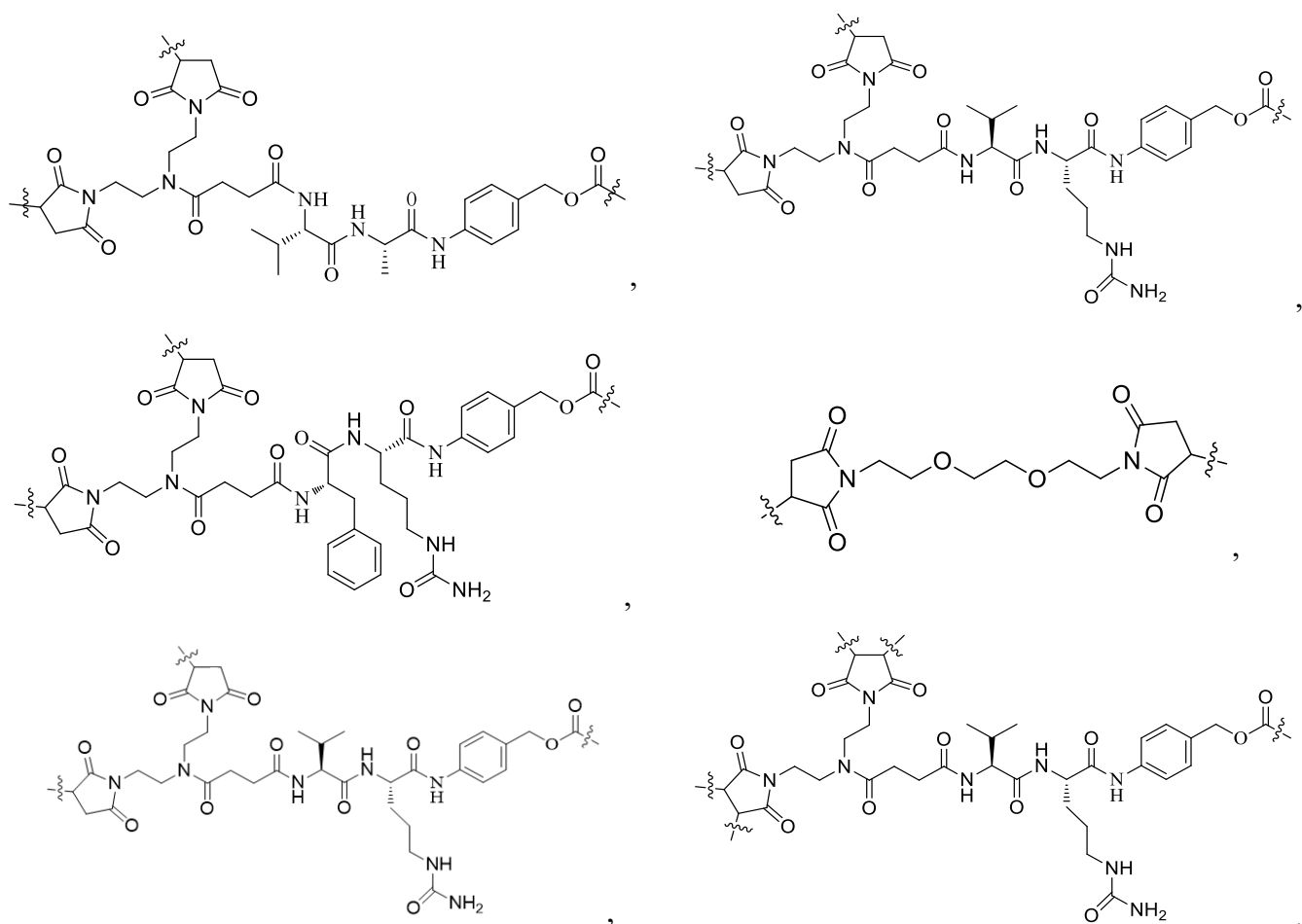
-valine-lysine- (-Val-Lys-), -valine-arginine- (-Val-Arg-), -phenylalanine-citrulline- (-Phe-Cit-), -phenylalanine-lysine- (-Phe-Lys-), -phenylalanine-arginine- (-Phe-Arg-) and a combination thereof.

- 5 17. The antibody-drug conjugate according to claim 15 or 16, wherein L comprises a structure selected from the group consisting of:

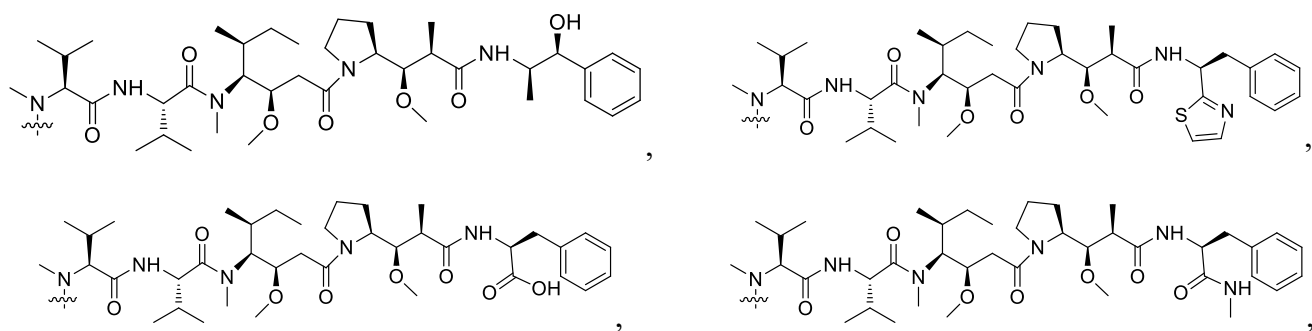


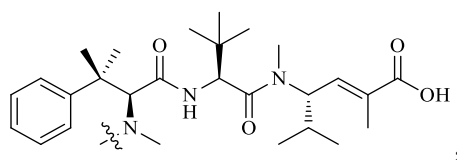
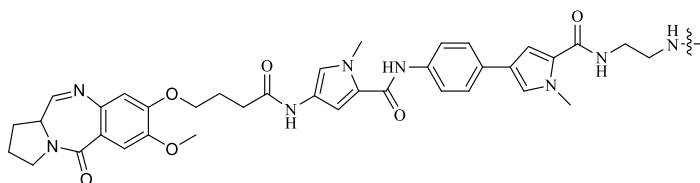
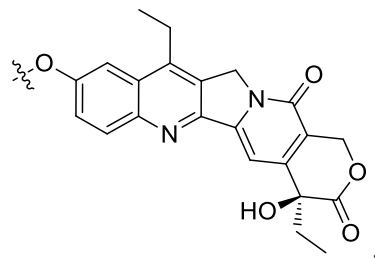
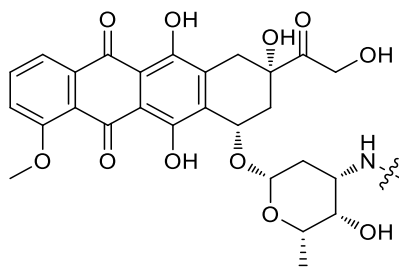
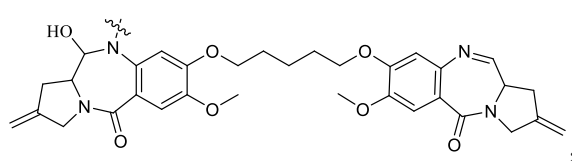
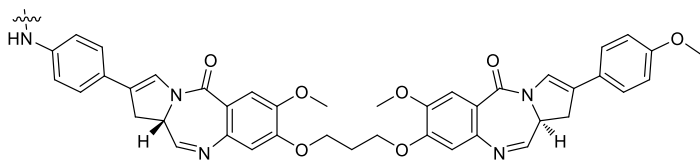
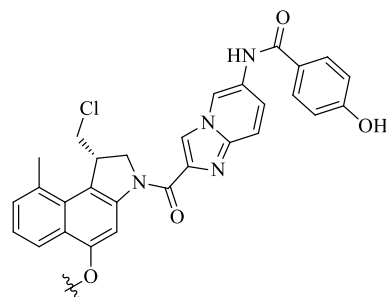
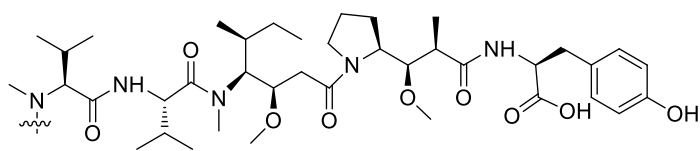
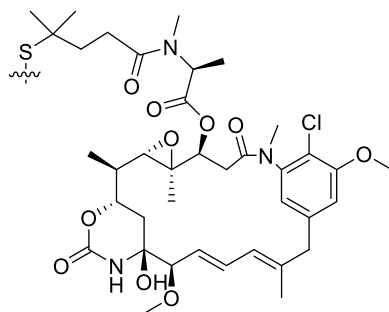
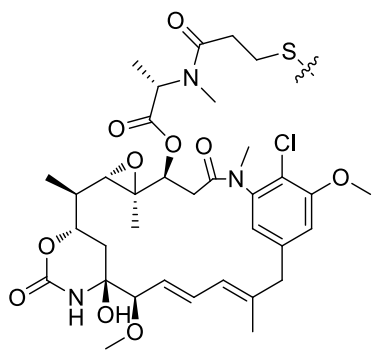


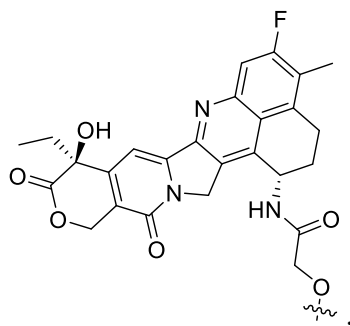
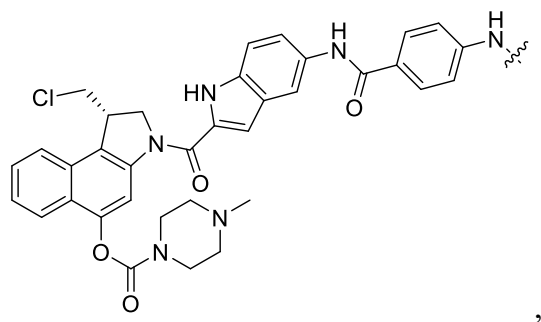
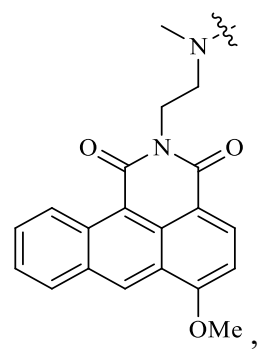
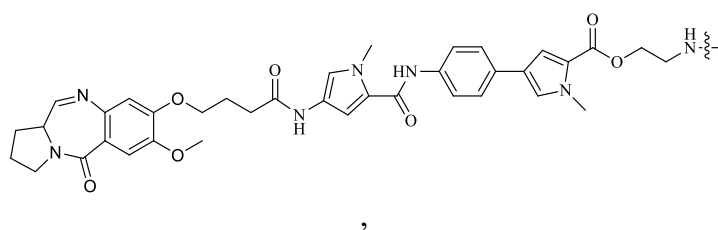
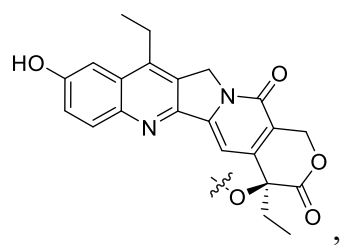
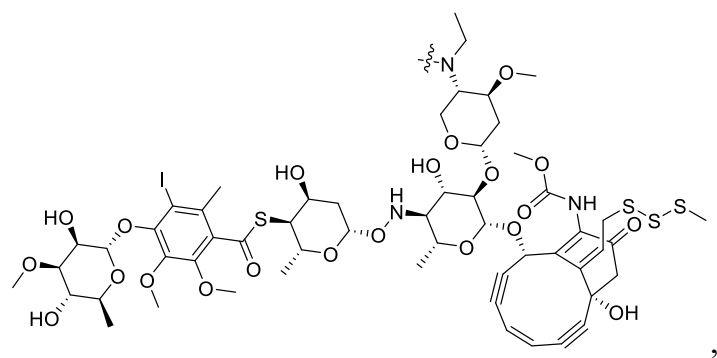
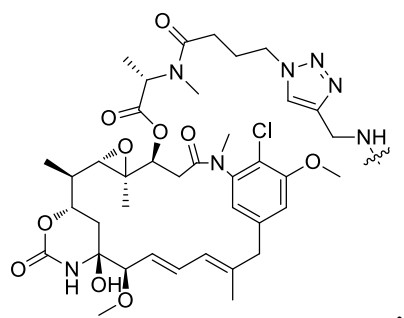
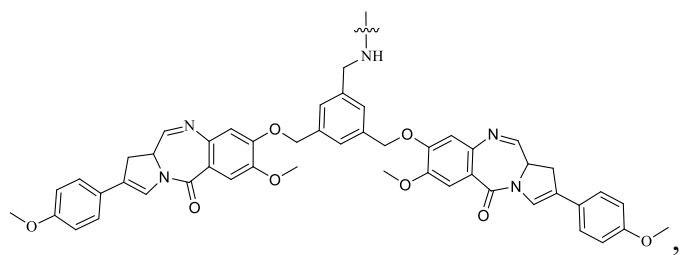




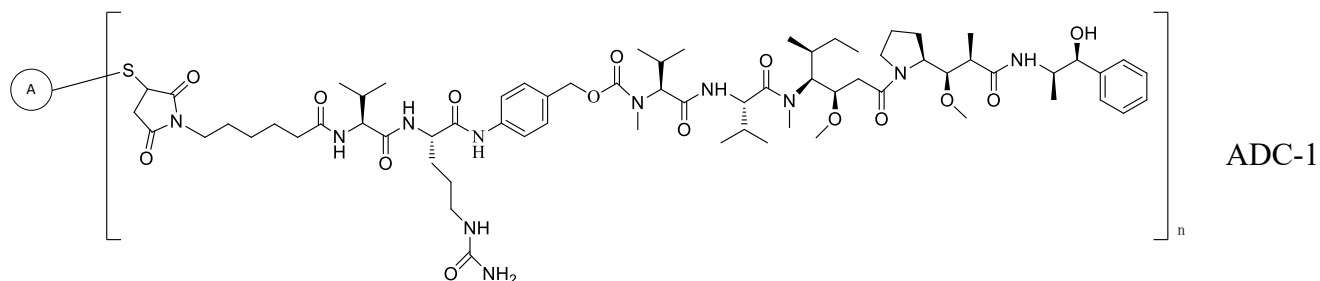
18. The antibody-drug conjugate according to claim 13 or claim 17, wherein U has a structure selected from the group consisting of:



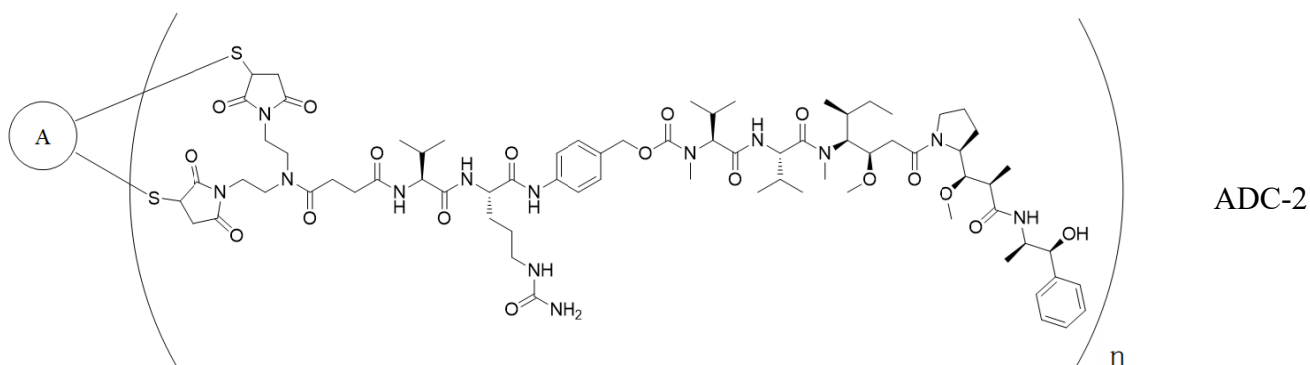




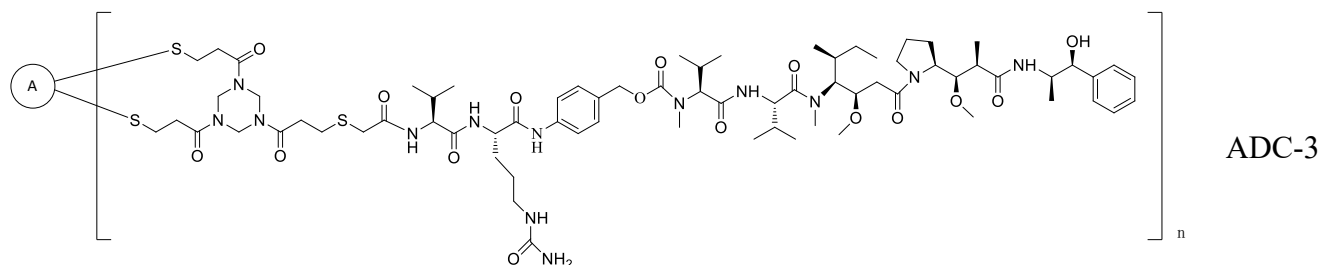
19. The antibody-drug conjugate according to claim 13, wherein the antibody-drug conjugate has a structure selected from the group consisting of:



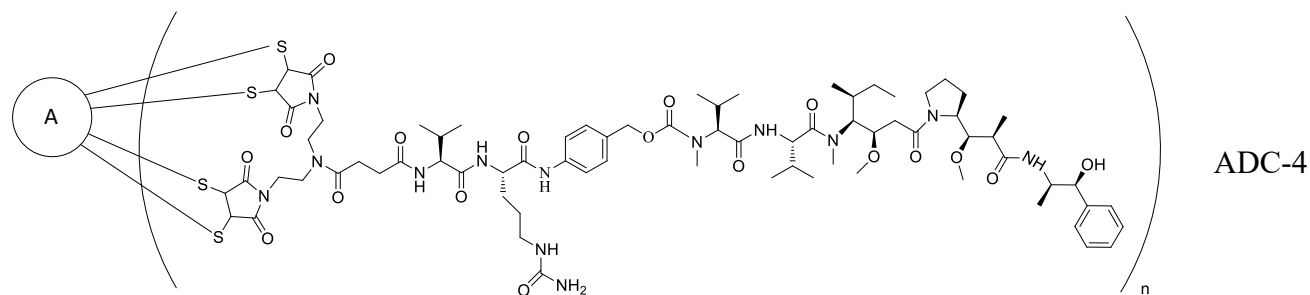
wherein, n in ADC-1 is an integer selected from 1, 2, 3, 4, 5, 6, 7 and 8; or



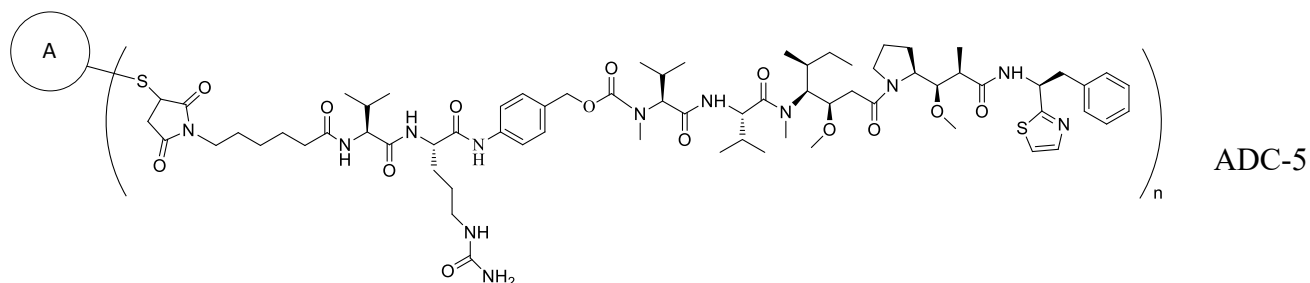
wherein, n in ADC-2 is an integer selected from 1, 2, 3 and 4; or



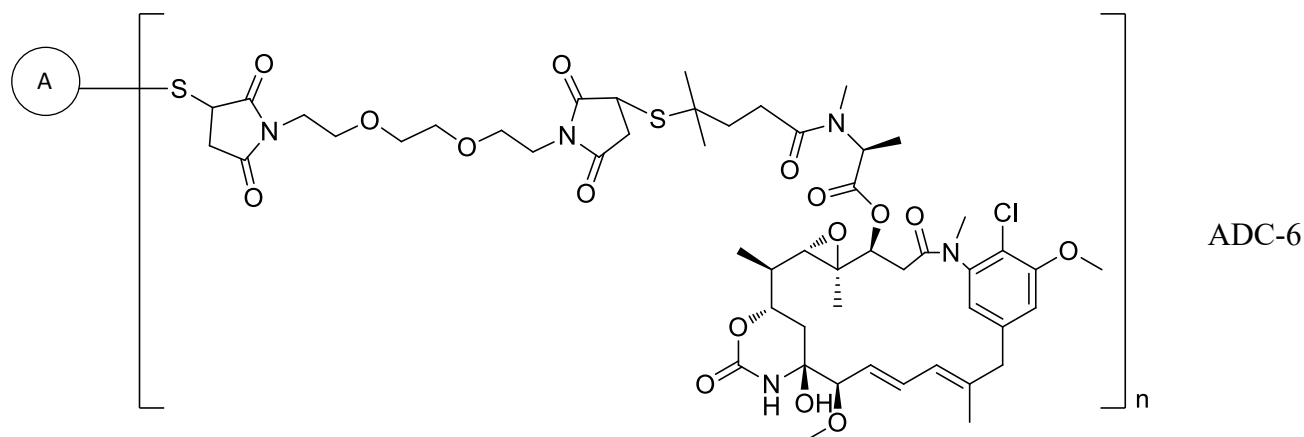
wherein, n in ADC-3 is an integer selected from 1, 2, 3 and 4; or



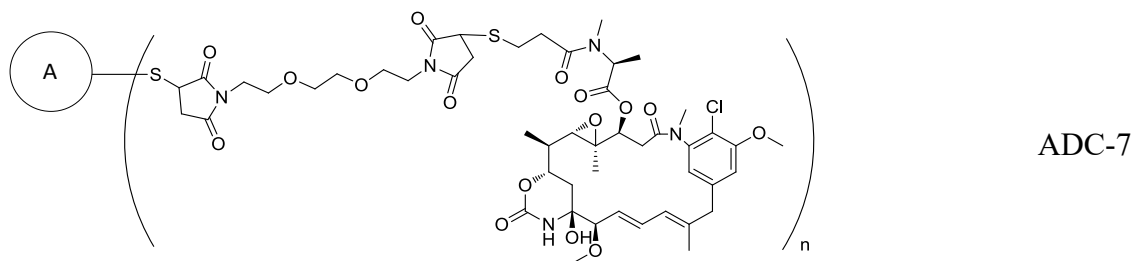
wherein, n in ADC-4 is an integer selected from 1 and 2; or



wherein, n in ADC-5 is an integer selected from 1, 2, 3, 4, 5, 6, 7 and 8; or



wherein, n in ADC-6 is an integer selected from 1, 2, 3, 4, 5, 6, 7 and 8; or



wherein, n in ADC-7 is an integer selected from 1, 2, 3, 4, 5, 6, 7 and 8.

20. A pharmaceutical composition comprising the antibody or antigen-binding fragment thereof according to any one of claims 1-5 and/or the antibody-drug conjugate according to any one of claims 11-19, and a pharmaceutically acceptable carrier.

21. Use of the antibody or antigen-binding fragment thereof according to any one of claims 1-5, the antibody-drug conjugate according to any one of claims 11-19 or the pharmaceutical composition according to claim 20 in the manufacture of a medicament for treating cancer.

5 22. The use according to claim 21, wherein the cancer is a c-Met positive cancer.

23. The use according to claim 22, wherein the c-Met positive cancer is selected from the group consisting of lung cancer and gastric cancer.

10 24. A kit comprising a container, a preparation placed in the container and an optional instruction; wherein the preparation comprises the antibody or antigen-binding fragment thereof according to any one of claims 1-5, the antibody-drug conjugate according to any one of claims 11-19 or a pharmaceutically acceptable salt, or the pharmaceutical composition according to claim 20.

15 25. Use of the antibody or antigen-binding fragment thereof according to any one of claims 1-5, the antibody-drug conjugate according to any one of claims 11-19, or the pharmaceutical composition according to claim 20 in the manufacture of a medicament for treating cancer.

20 26. The use according to claim 25, wherein the cancer is a solid tumor; and wherein the solid tumor is selected from the group consisting of lung cancer and gastric cancer.

27. A recombinant protein comprising the antibody or antigen-binding fragment according to any one of claims 1-5.

25 28. The recombinant protein according to claim 27, wherein the recombinant protein is a bispecific antibody or a multispecific antibody.

29. Use of the antibody or antigen-binding fragment according to any one of claims 1-5 in the manufacture of a recombinant protein.