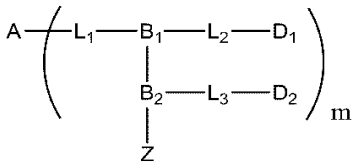
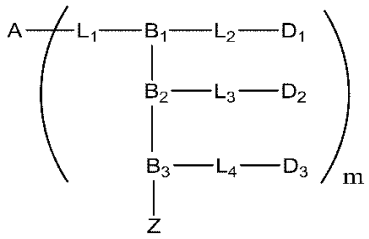
CLAIMS

1. An antibody-drug conjugate represented by formula (II) to formula (IV):



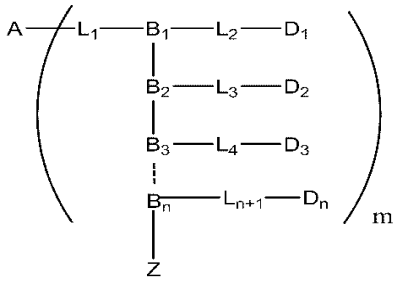
(II)

or



(III)

or



(IV)

;

wherein,

A is an antibody or a functional binding fragment thereof;

B_1, B_2, B_3, ..., and B_n are cysteine or a derivative thereof, which may be the same or different; B_1 and B_2, B_2 and B_3, ..., B_{n-1} and B_n are linked via a peptide bond through a dehydration condensation reaction;

L_1, L_2, L_3, L_4, ..., and L_{n+1} are each independently a linker, which may be the same or different; L_1 is covalently linked to the amino terminus of B_1, L_2 and B_1, L_3 and B_2, L_4 and B_3, ..., L_{n+1} and B_n are covalently linked via a thiol group, and L_2 and D_1, L_3 and D_2, L_4 and D_3, ..., L_{n+1} and D_n are covalently linked;

D_1, D_2, D_3, ..., and D_n are each independently an active drug, and the drug is the same;

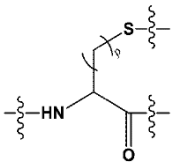
Z is covalently linked to the carbonyl group of B_1 in formula (I), the carbonyl group of B_2 in formula (II), the carbonyl group of B_3 in formula (III) or the carbonyl

group of B_n in formula (IV) ;

n is an integer greater than or equal to 4, which represents the number of branches linking to the active drugs; and

m is selected from the group consisting of 1, 2, 3, 4, 5, 6, 7 and 8;

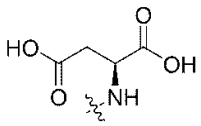
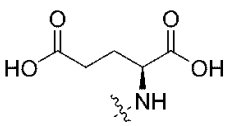
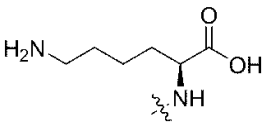
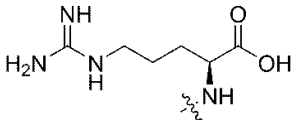
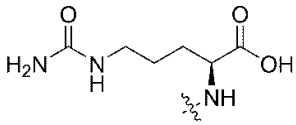
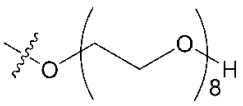
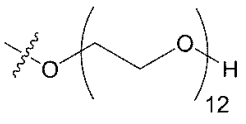
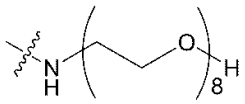
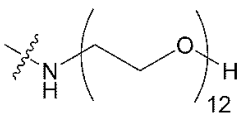
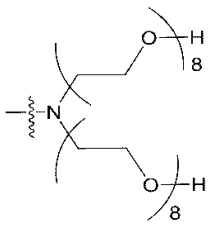
the structures of B_1, B_2, B_3, ..., and B_n are respectively represented by formula (V):


(V)

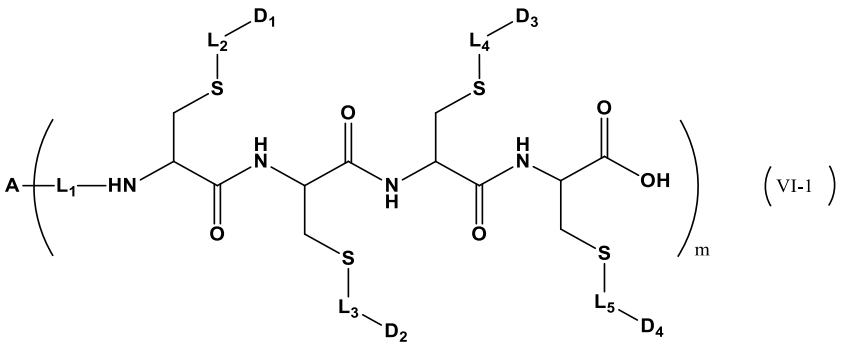
,

wherein p is selected from the group consisting of 1, 2, 3, 4, 5, 6, 7 and 8; and

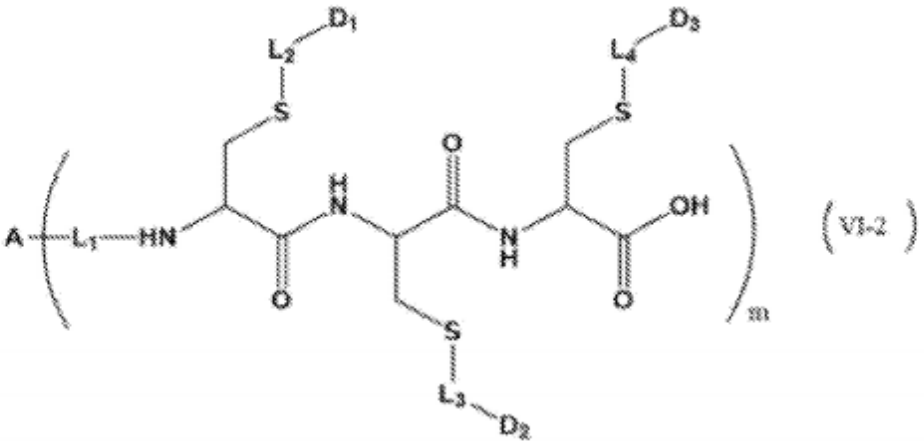
Z is selected from the group consisting of:

OH , **SH** , **NH_2** ,

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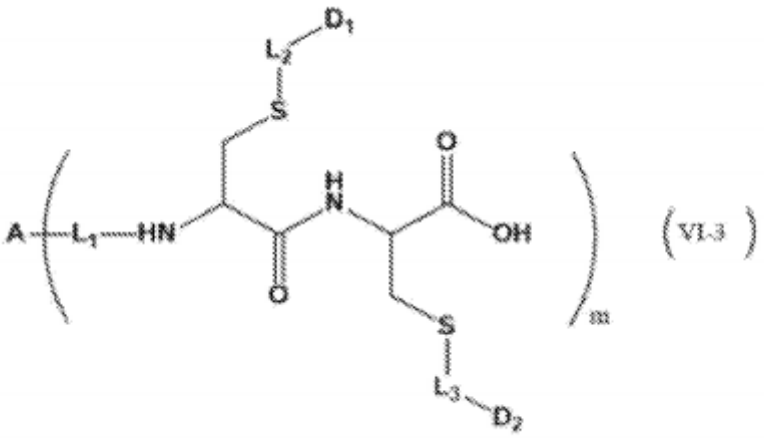
2. The antibody-drug conjugate according to claim 1, which has a structure represented by formula (VI-1) to (VI-5):



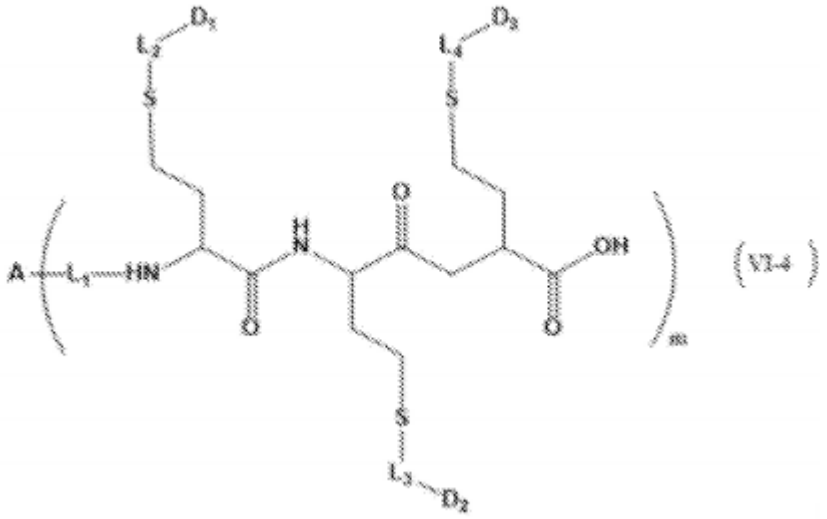
(VI-1)



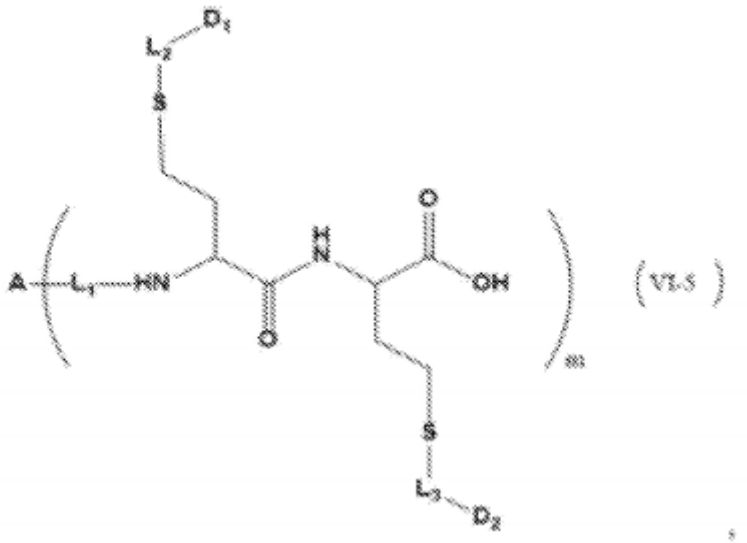
(VI-2)



(VI-3)



and



wherein

A is an antibody or a functional binding fragment thereof;

L_1, L_2, L_3, L_4 and L_5 are each independently a linker, which may be the same or different;

D_1, D_2, D_3 and D_4 are each independently an active drug, which may be the same or different; and

m is selected from the group consisting of 1, 2, 3, 4, 5, 6, 7 and 8.

3. The antibody-drug conjugate according to claims 1 or 2, wherein L_1 is covalently linked to an amino residue or a thiol residue of the antibody; preferably, L_1

is covalently linked to a thiol group of the antibody; more preferably, L_1 is covalently linked to a thiol residue formed by breaking an interchain disulfide bond of the antibody.

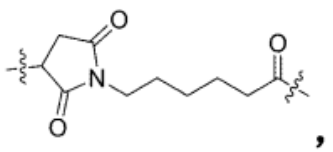
4. The antibody-drug conjugate according to any one of the preceding claims, wherein each of L_1, L_2, L_3, L_4, ..., and L_{n+1} is independently selected from a cleavable linker, and a non-cleavable linker.

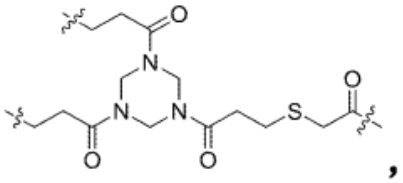
5. The antibody-drug conjugate according to claim 4, wherein the cleavable linker is a peptide linker or a polysulfide bond, and wherein

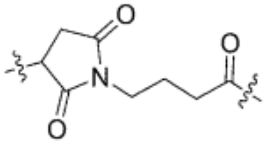
the peptide linker comprises 2 to 20 amino acids, preferably the peptide linker is selected from the group consisting of -valine-citrulline- (-Val-Cit-), -glycine-glycine-phenylalanine-glycine- (-Gly-Gly-Phe-Gly-), -valine-alanine- (-Val-Ala-), -valine-lysine- (-Val-Lys-), -valine-arginine- (-Val-Arg-), -phenylalanine-citrulline- (-Phe-Cit-), -phenylalanine-lysine- (-Phe-Lys-), -phenylalanine-arginine- (-Phe-Arg-) and a combination thereof; and

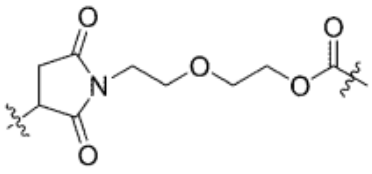
the polysulfide bond contains 2 to 8 sulfur atoms, preferably the polysulfide bond is selected from the group consisting of a disulfide bond (-S-S-), a trisulfide bond (-S-S-S-) and a tetrasulfide bond (-S-S-S-S-).

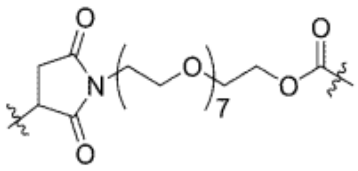
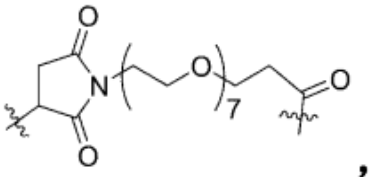
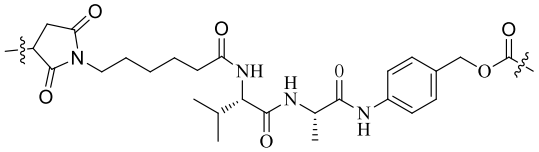
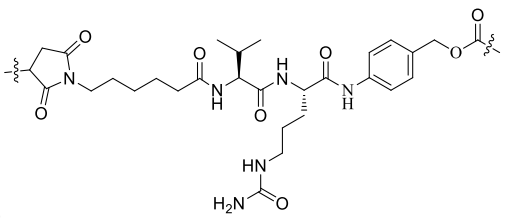
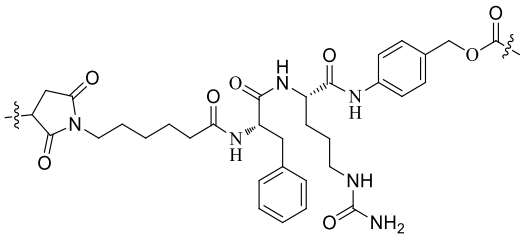
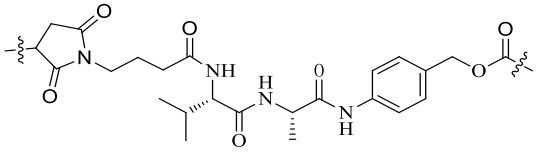
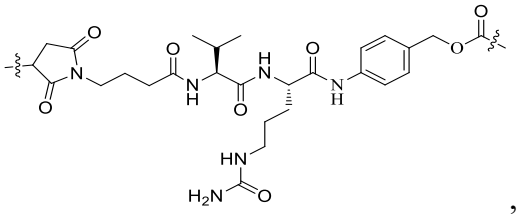
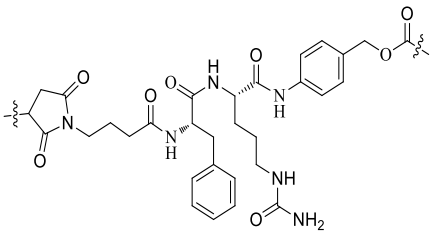
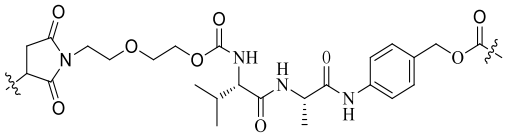
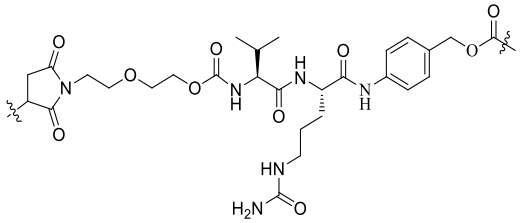
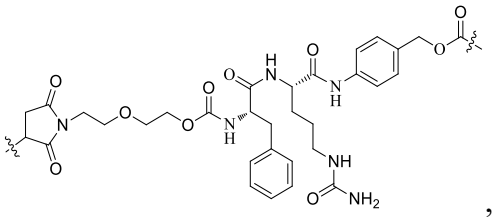
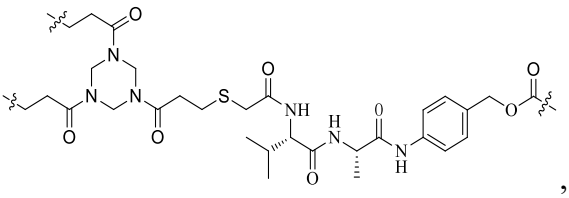
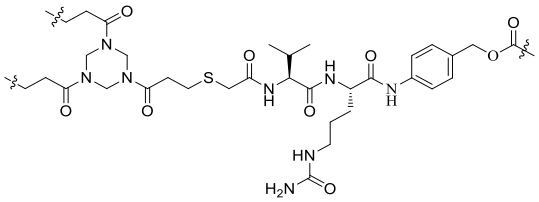
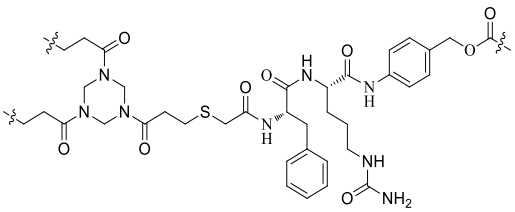
6. The antibody-drug conjugate according to any of the preceding claims, wherein L_1 includes the following structures:

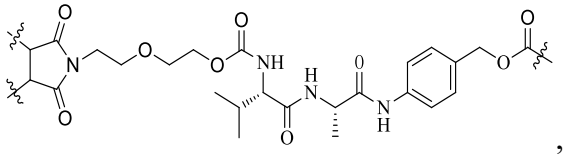
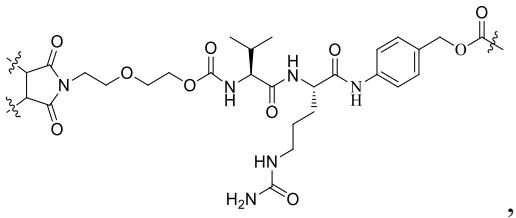
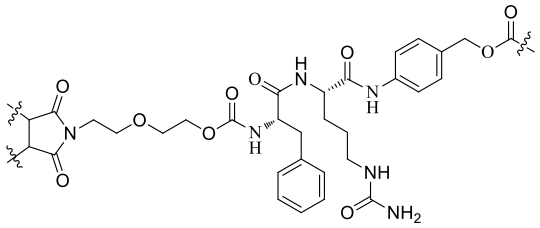
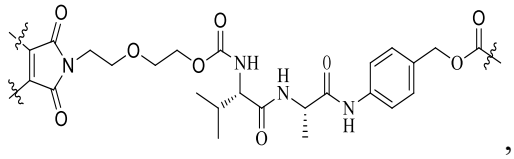
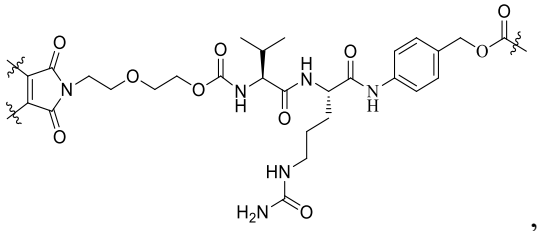
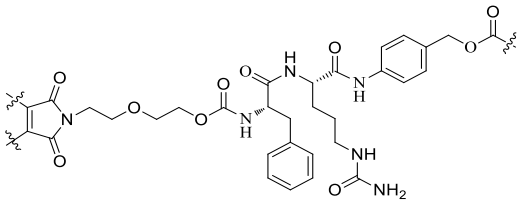
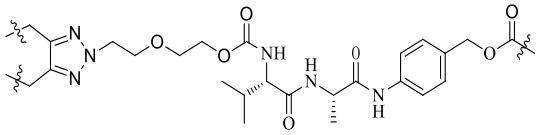
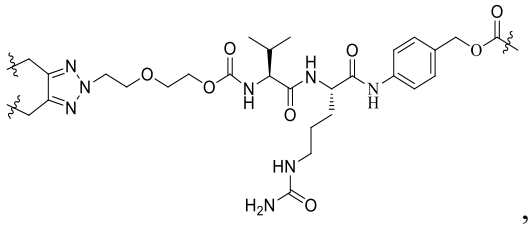
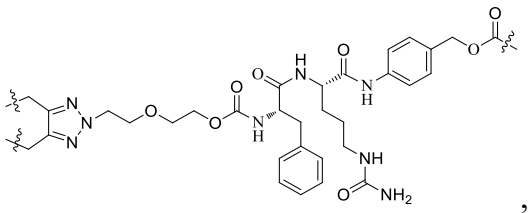
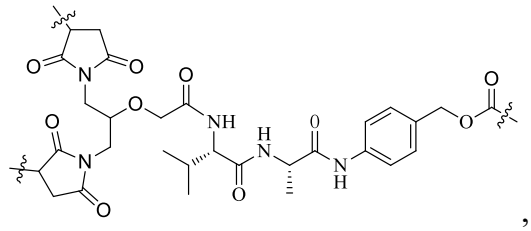
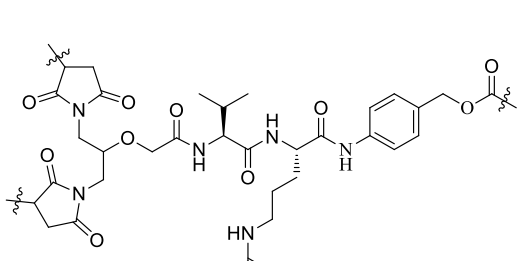
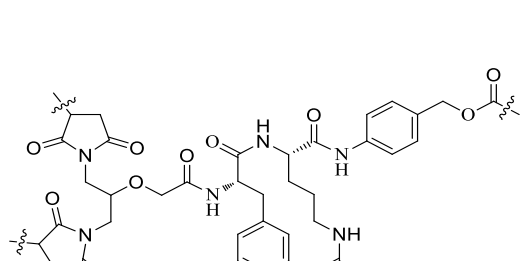

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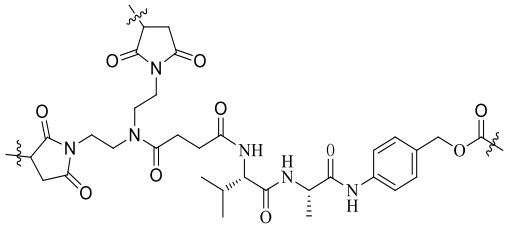
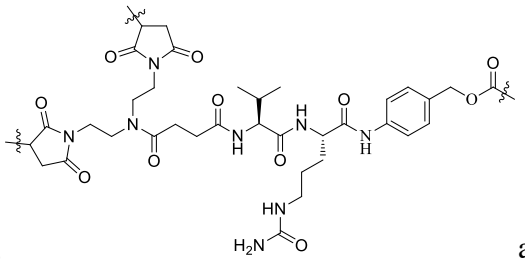
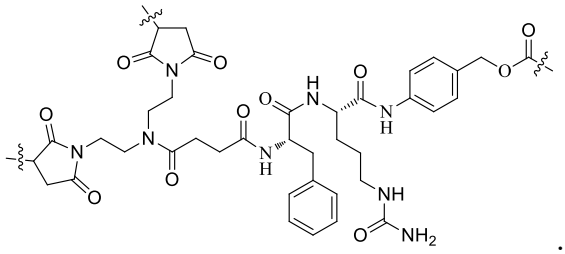

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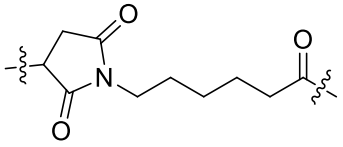
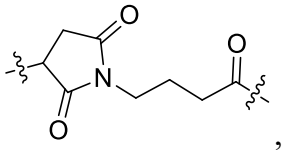
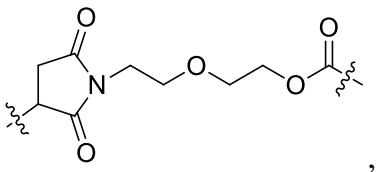
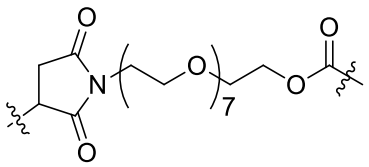
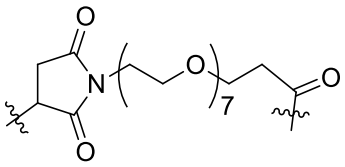
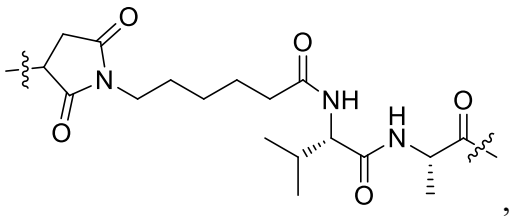
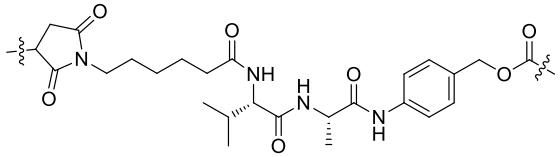
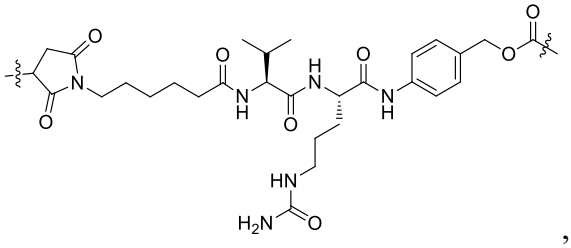

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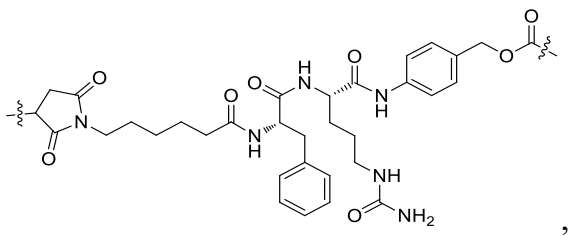
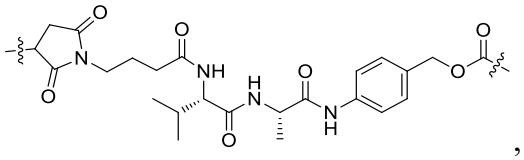
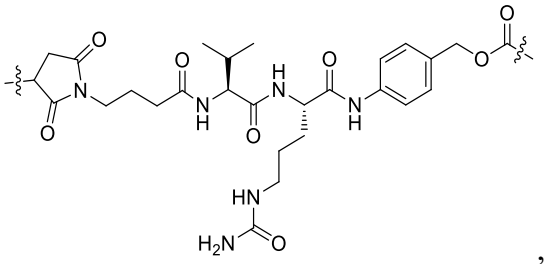
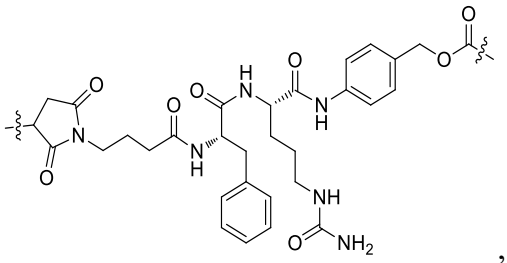
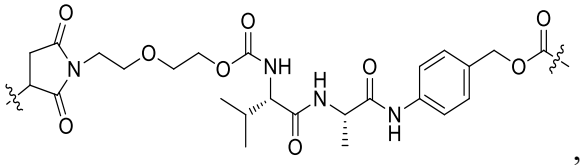
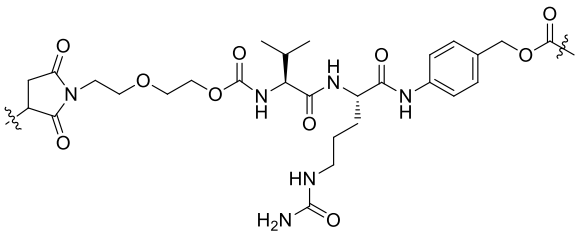
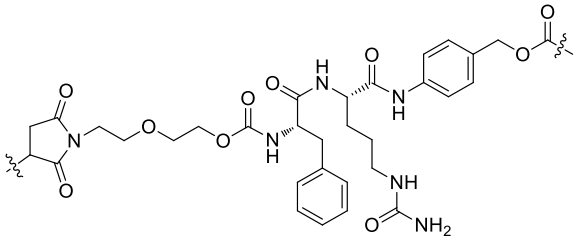
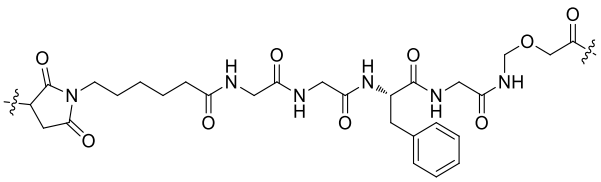
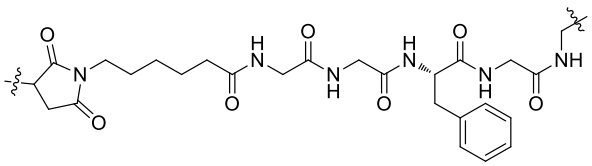
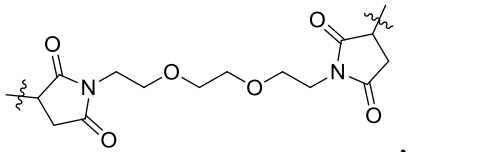
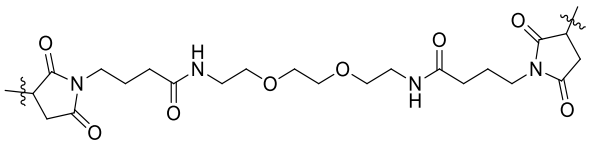
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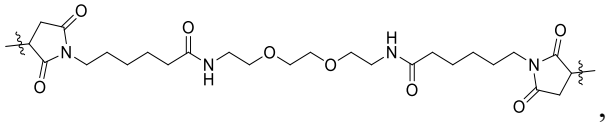

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and

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7. The antibody-drug conjugate according to any one of the preceding claims, wherein L_2, L_3, L_4, ..., and L_{n+1} includes the following structures:


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8. The antibody-drug conjugate according to any one of the preceding claims, wherein the antibody or functional binding fragment thereof includes a monoclonal antibody, a polyclonal antibody, an antibody fragment, Fab, Fab', Fab'-SH, $F(ab')_2$, Fv, single chain Fv ("scFv"), a diabody, a linear antibody, a bispecific antibody, a multispecific antibody, a chimeric antibody, a humanized antibody, a fully human antibody, or a fusion protein containing an antigen-binding fragment of antibody; preferably, the antibody is a humanized monoclonal antibody or a fully human antibody.

9. The antibody-drug conjugate according to claim 8, wherein the antibody is an IgG antibody or a functional binding fragment thereof, preferably, the antibody is selected from the group consisting of IgG_1, IgG_2, IgG_3 and IgG_4 antibodies.

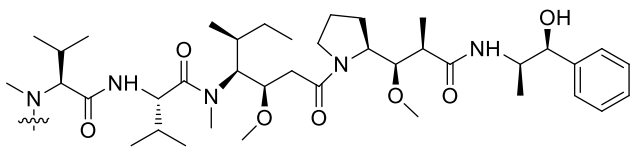
10. The antibody-drug conjugate according to any one of the preceding claims, wherein the active drug is selected from the group consisting of a cytotoxic molecule, a cell differentiation factor, a stem cell trophic factor, a steroids drug, a drug for treating an autoimmune disease, an anti-inflammatory drug and a drug for treating an infectious disease.

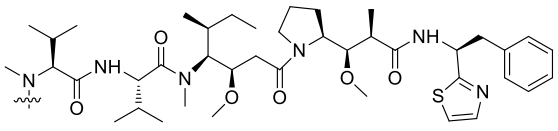
11. The antibody-drug conjugate according to claim 10, wherein the cytotoxic molecule includes a tubulin inhibitor and a DNA damaging agent;

preferably, the tubulin inhibitor includes a cytotoxic molecule of dolastatins and auristatins, a cytotoxic molecule of maytansines; the DNA damaging agent includes calicheamicins, duocarmycins, pyrrolobenzodiazepine (PBD), camptothecins, and SN-38;

more preferably, the cytotoxic molecule of auristatins includes MMAE and MMAF; and the cytotoxic molecule of maytansines includes DM1 and DM4; and

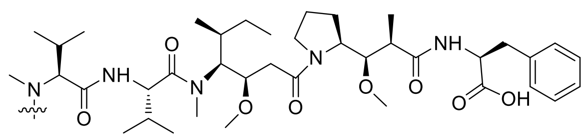
more preferably, the cytotoxic molecule includes the following structures:



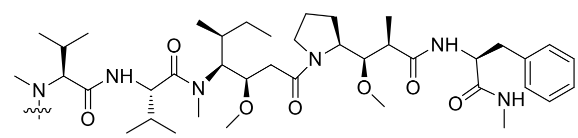


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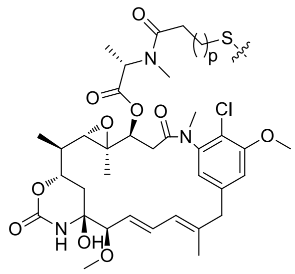
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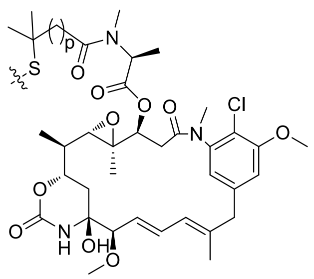
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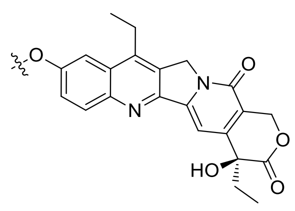
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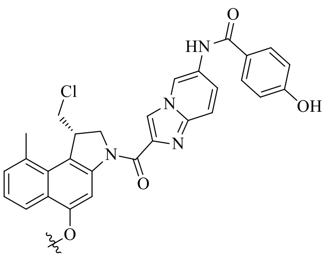
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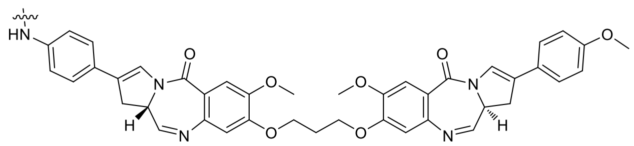
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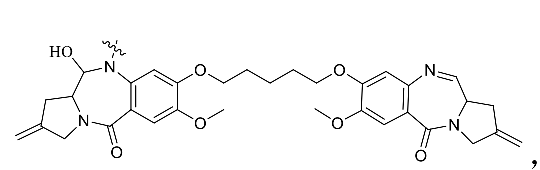
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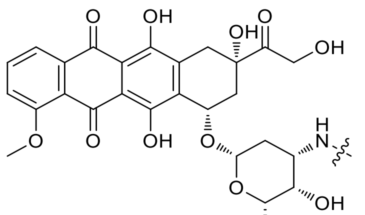
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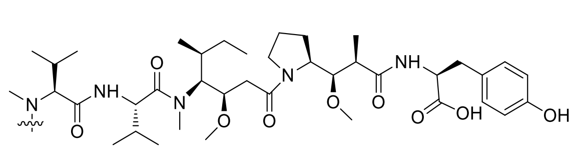
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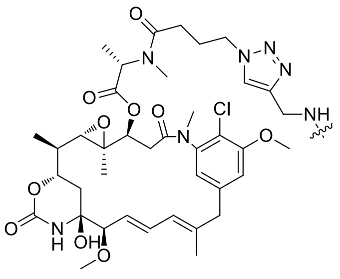
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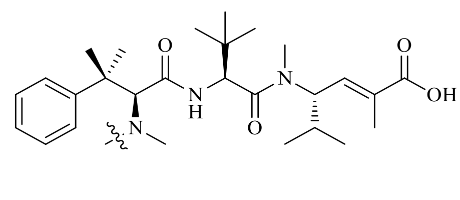
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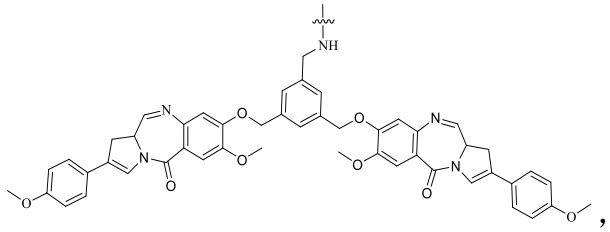
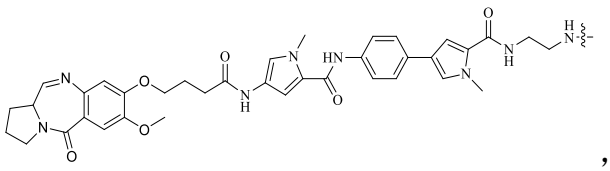
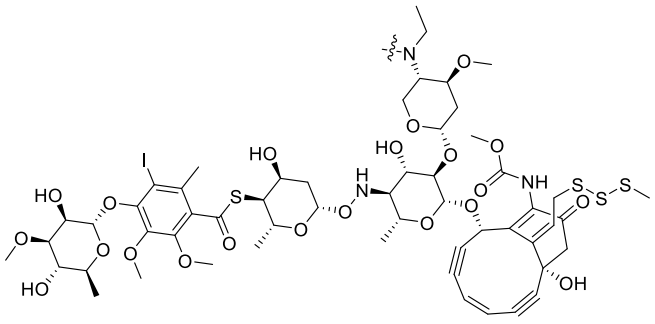
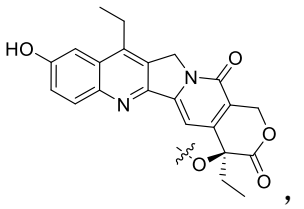
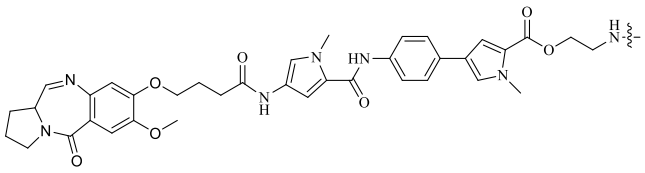
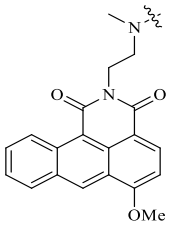
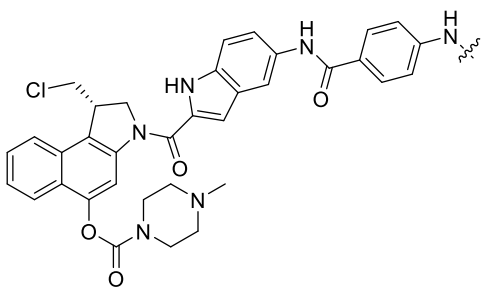
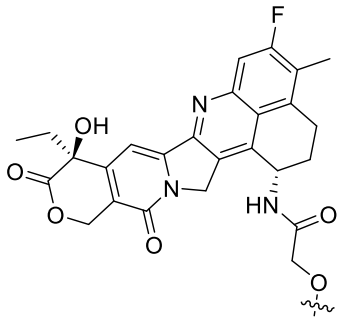
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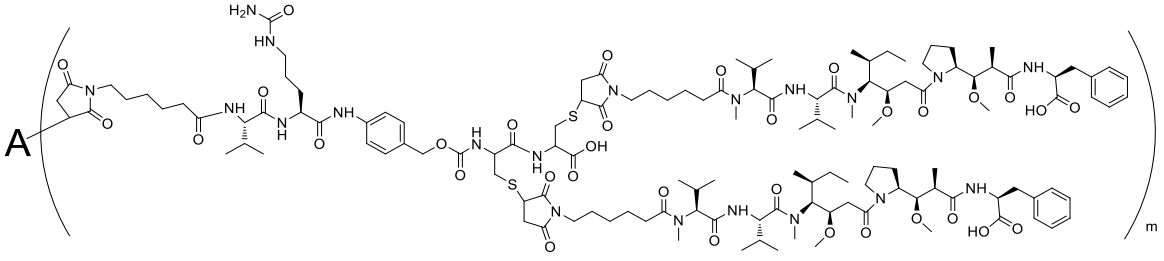
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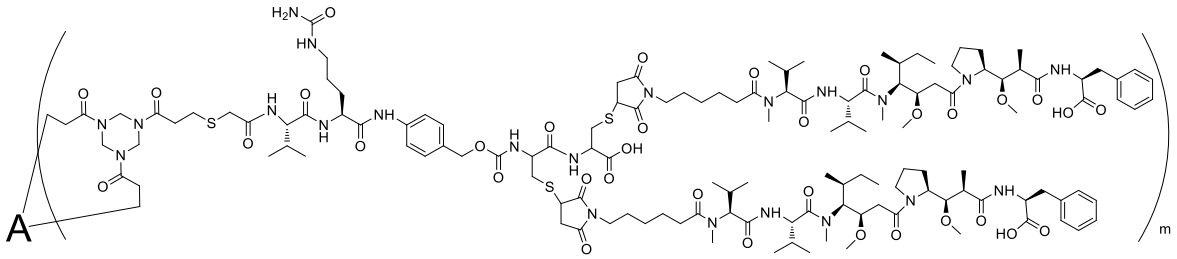


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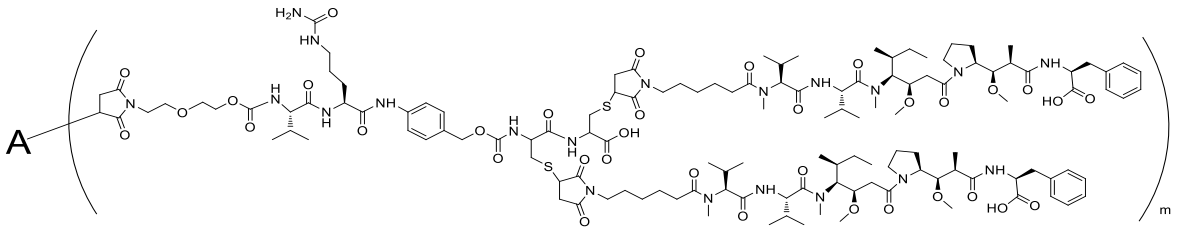

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12. The antibody-drug conjugate according to any one of the preceding claims, which has a structure represented as follows:

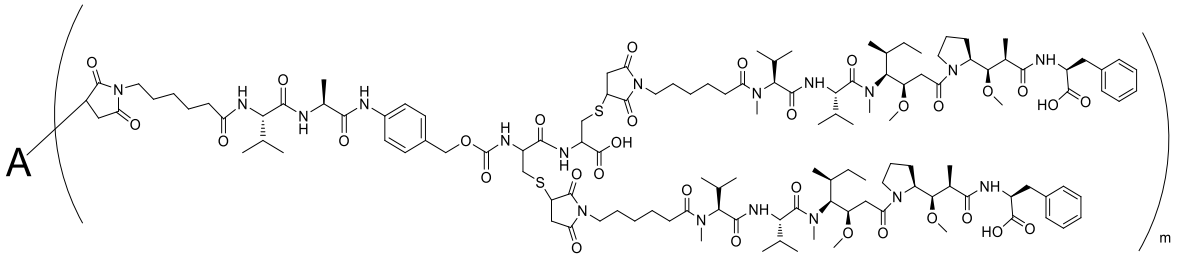

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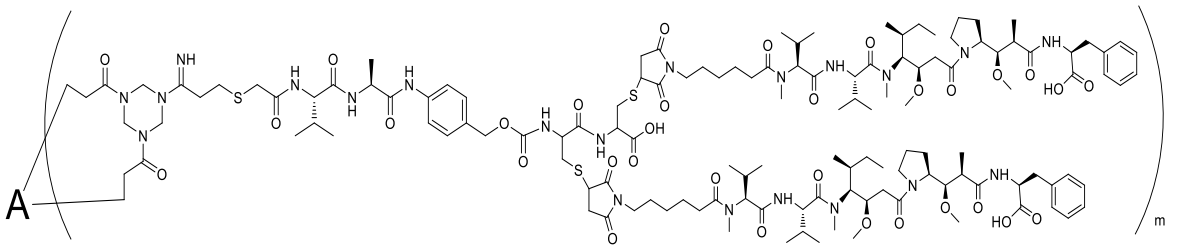
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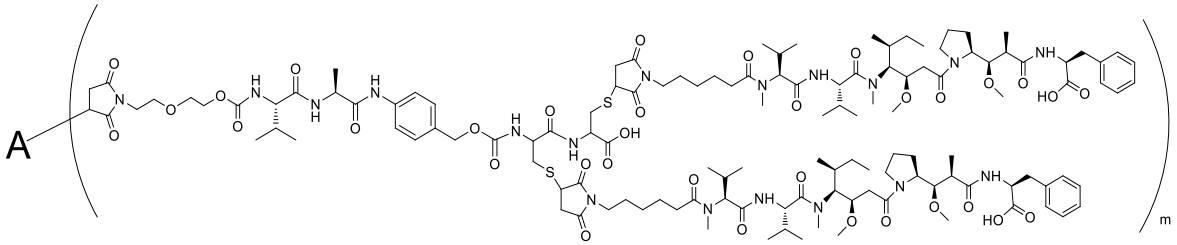
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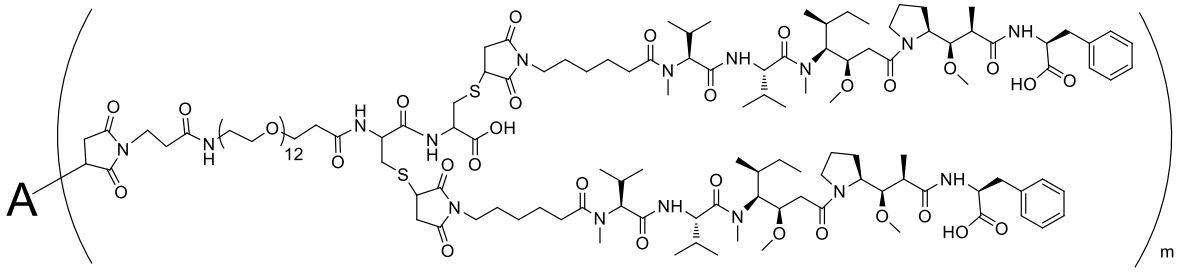
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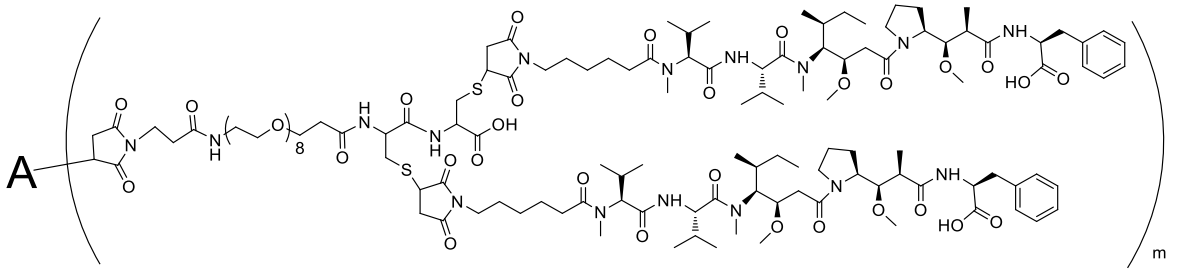
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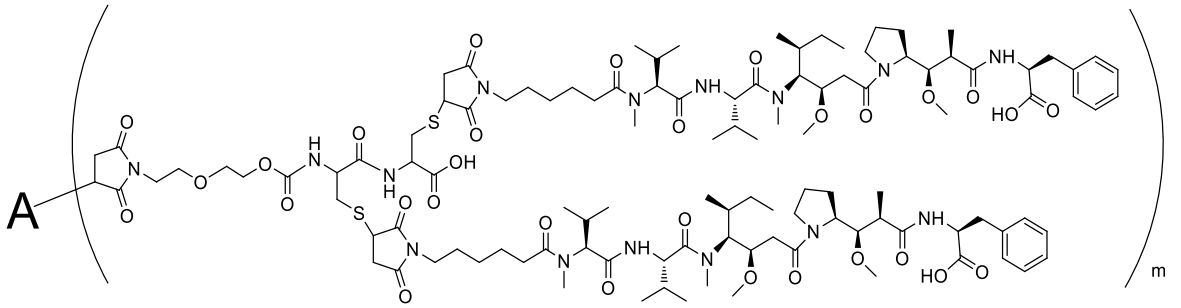
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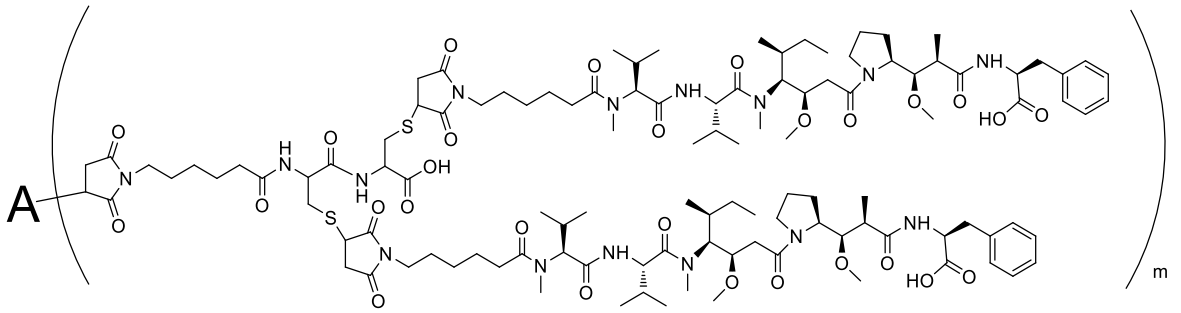
ADC-7



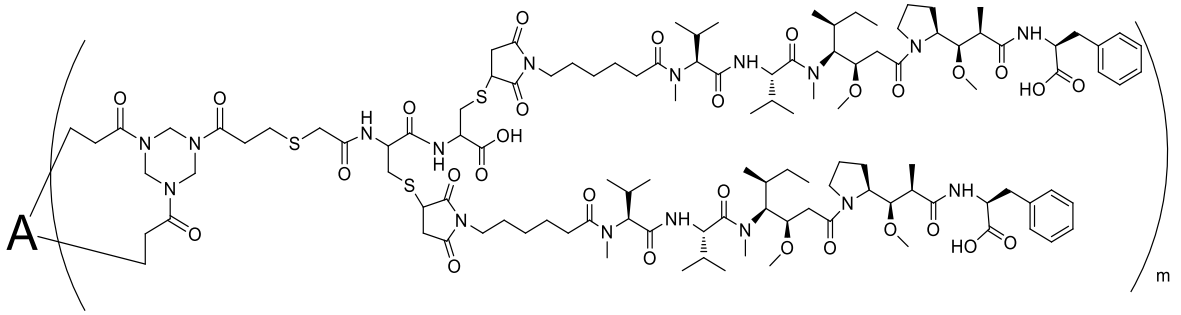
ADC-8



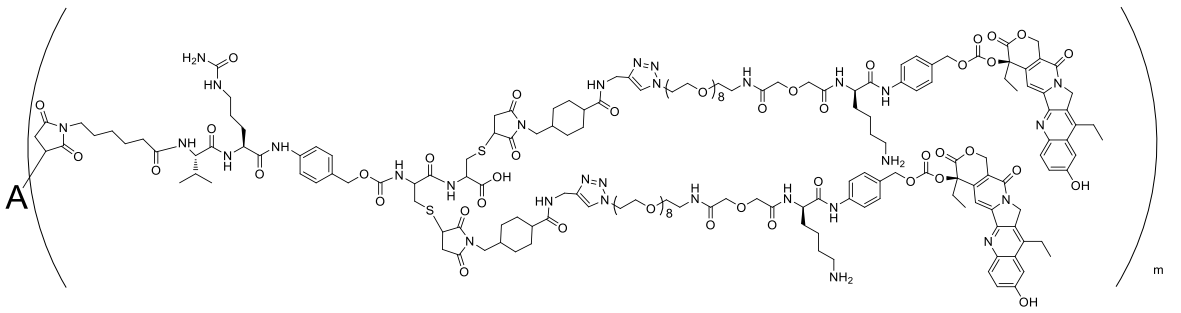
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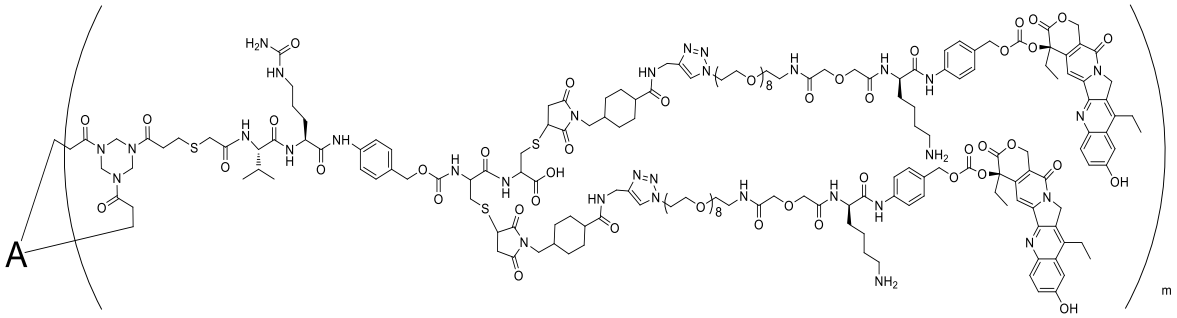
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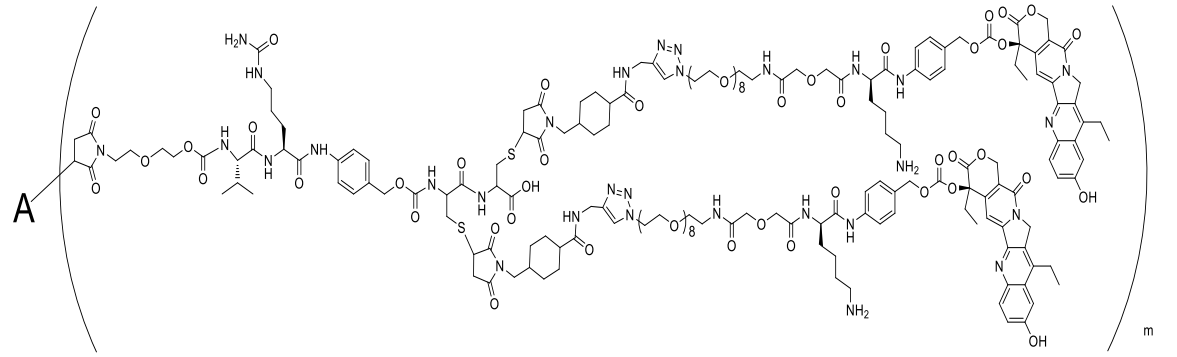
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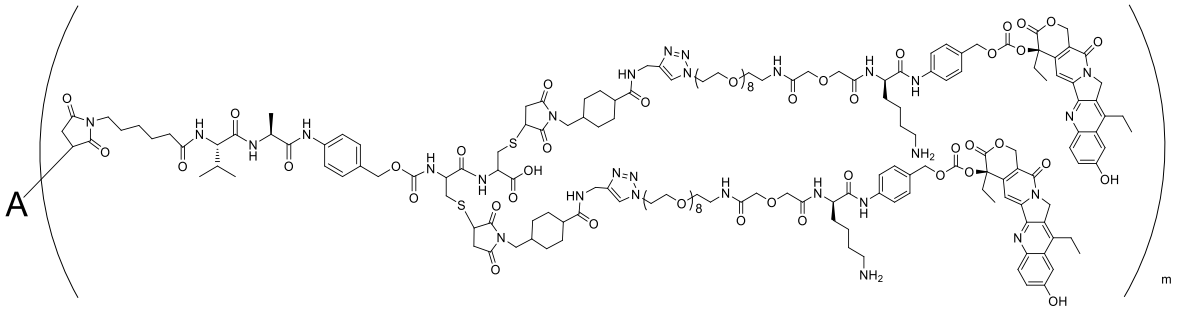
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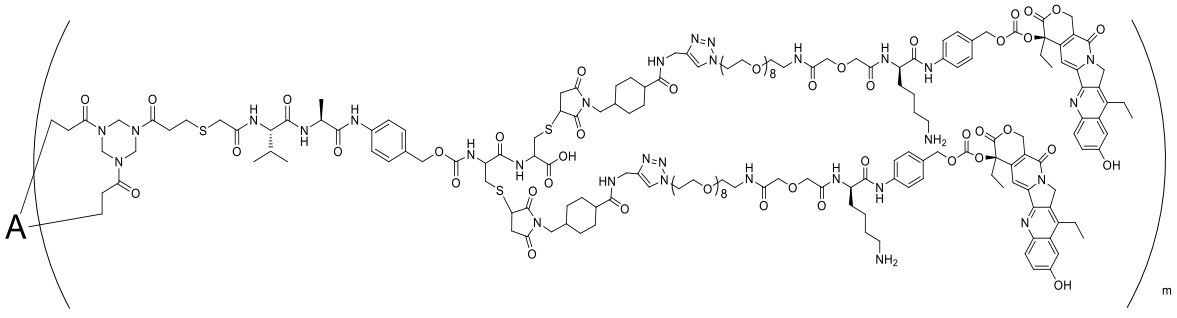
ADC-13



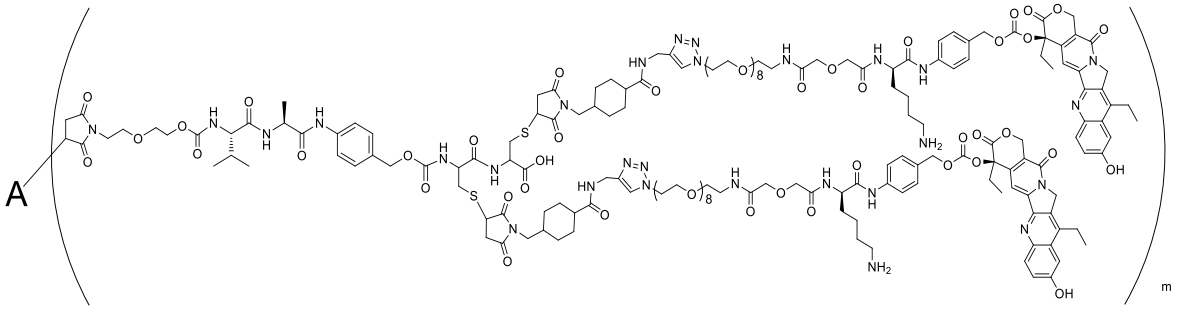
ADC-14



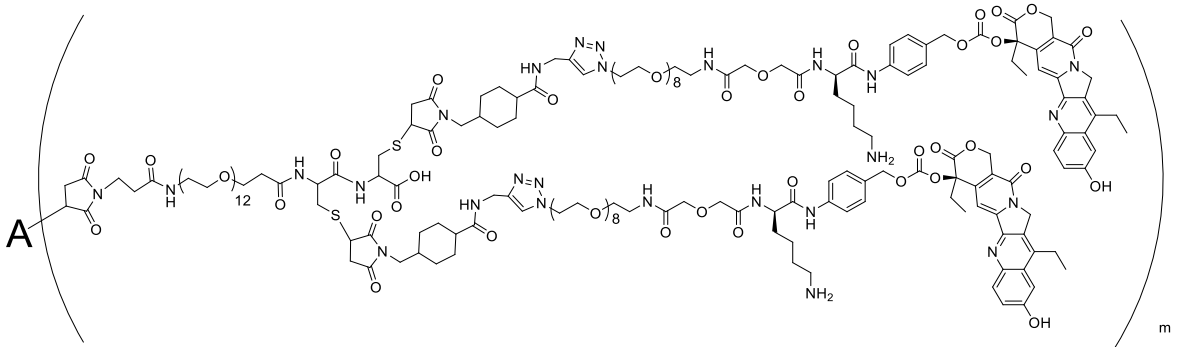
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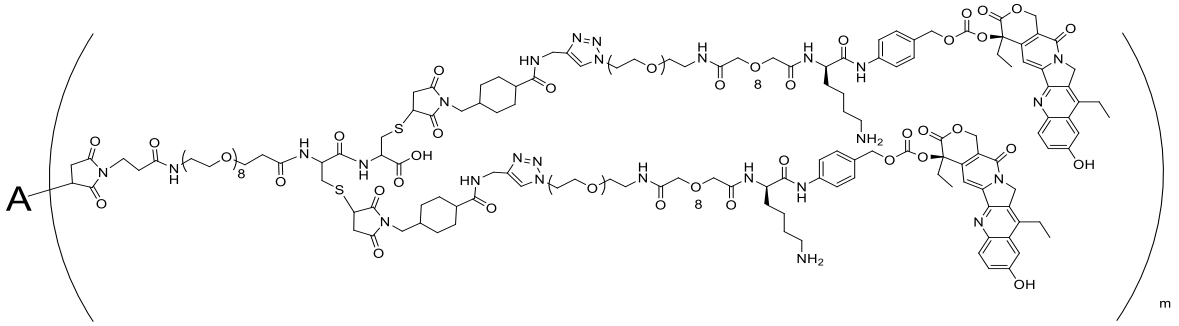
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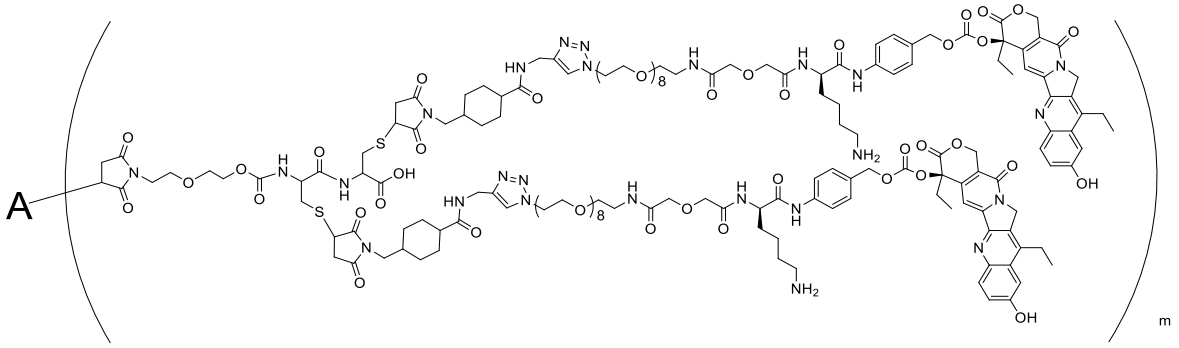
ADC-17



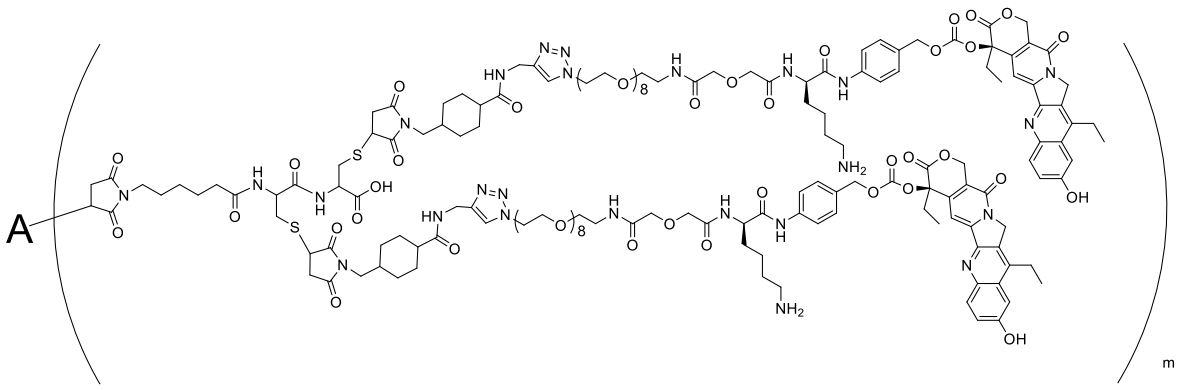
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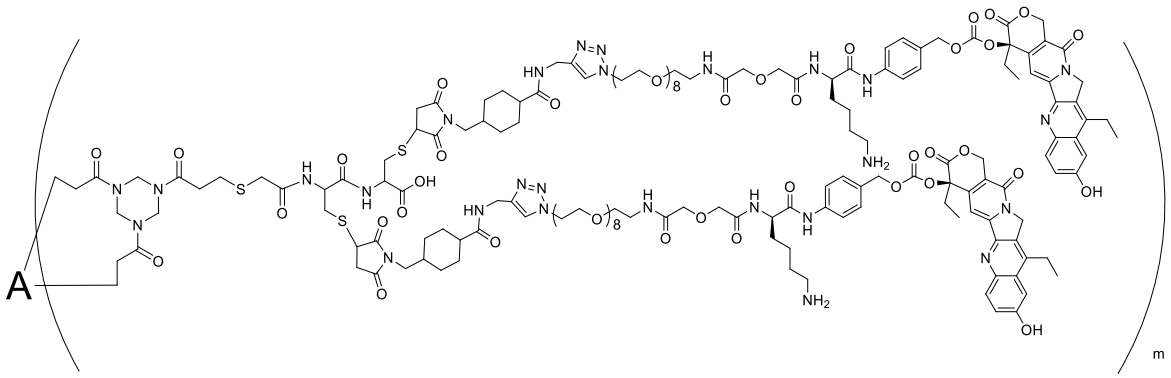
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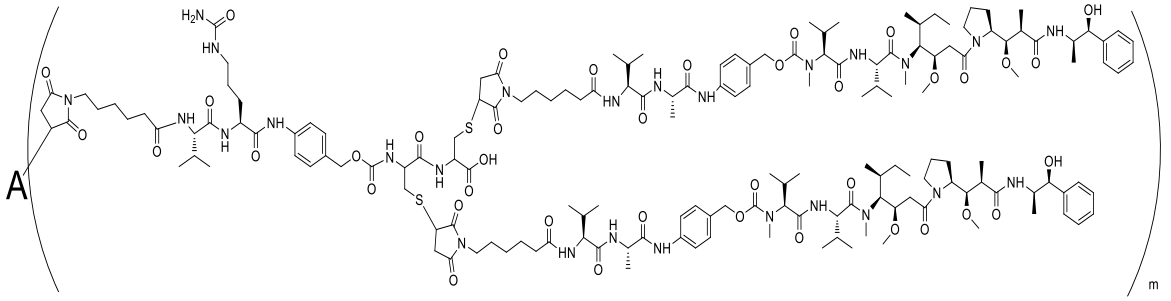
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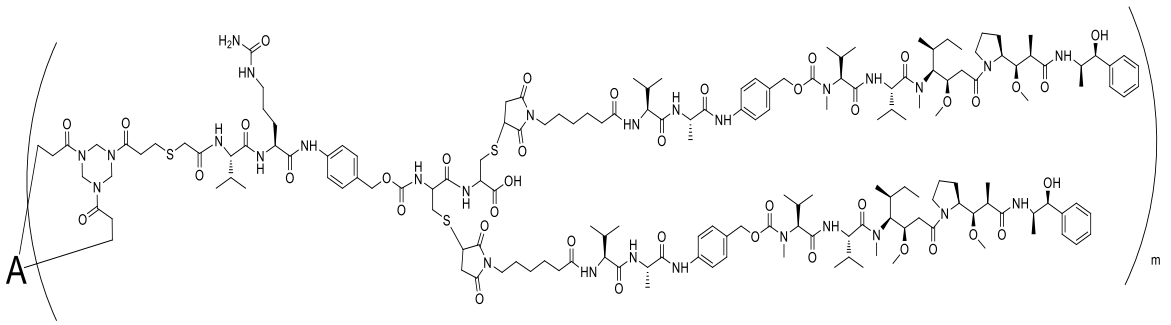
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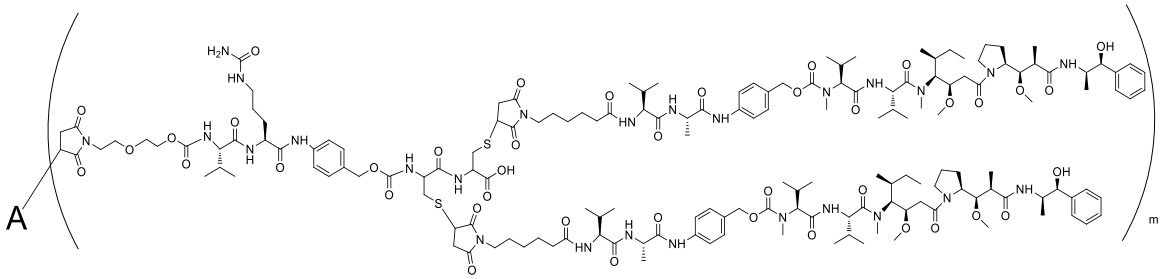
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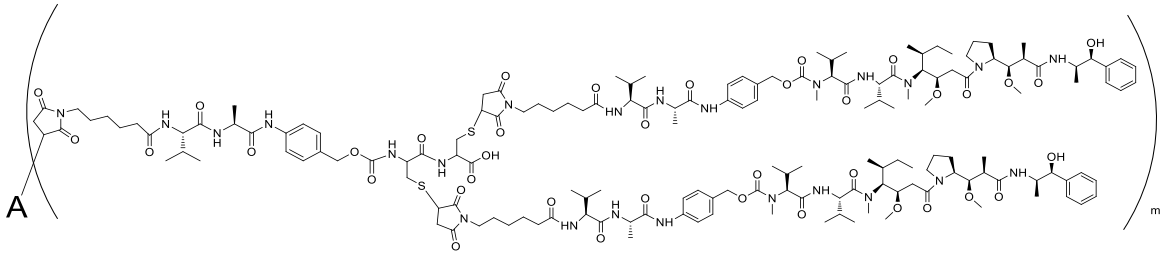
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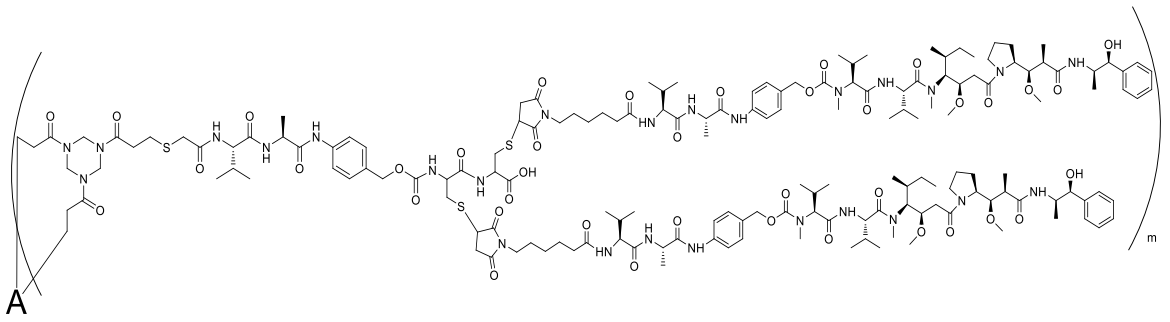
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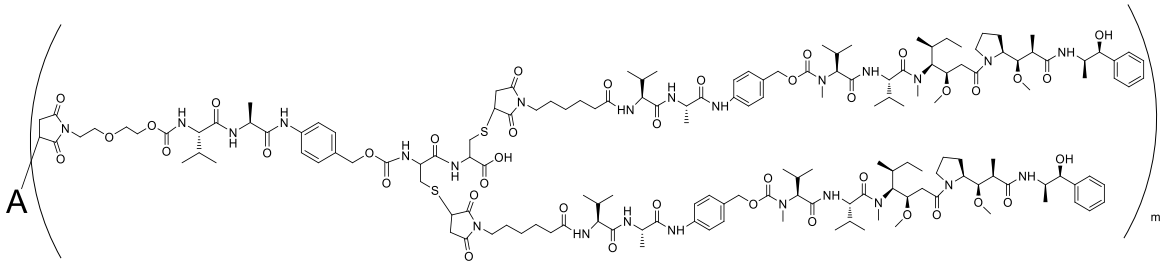
ADC-25



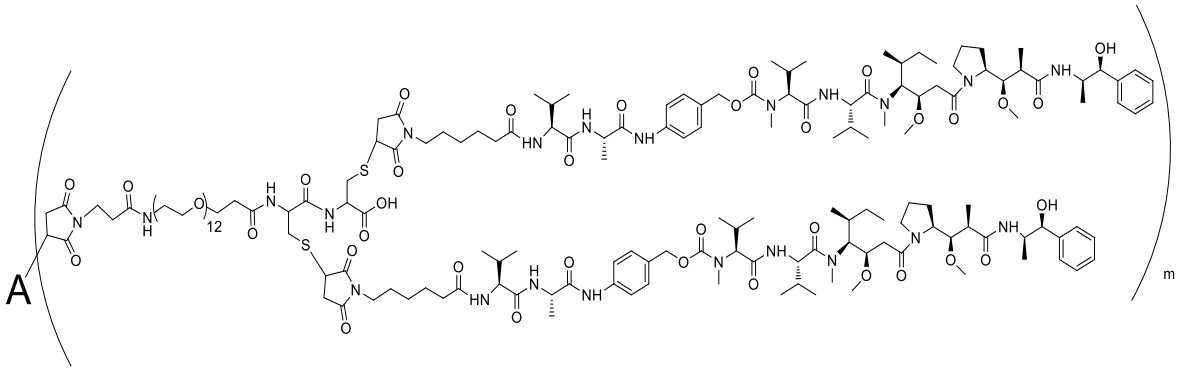
ADC-26



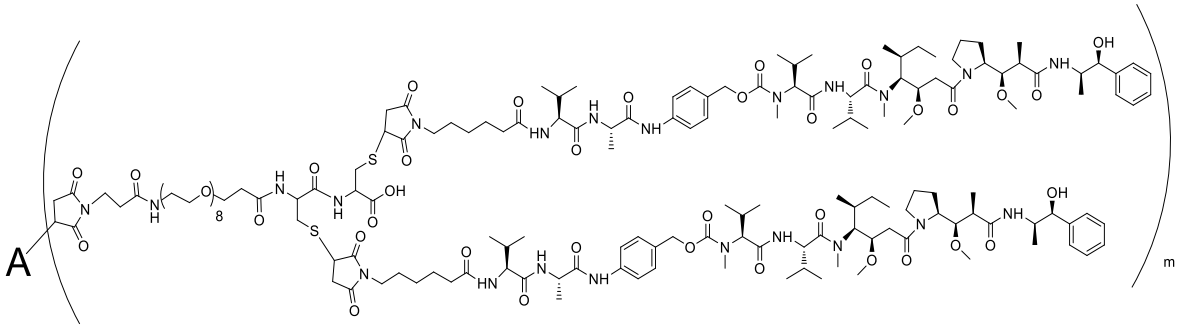
ADC-27



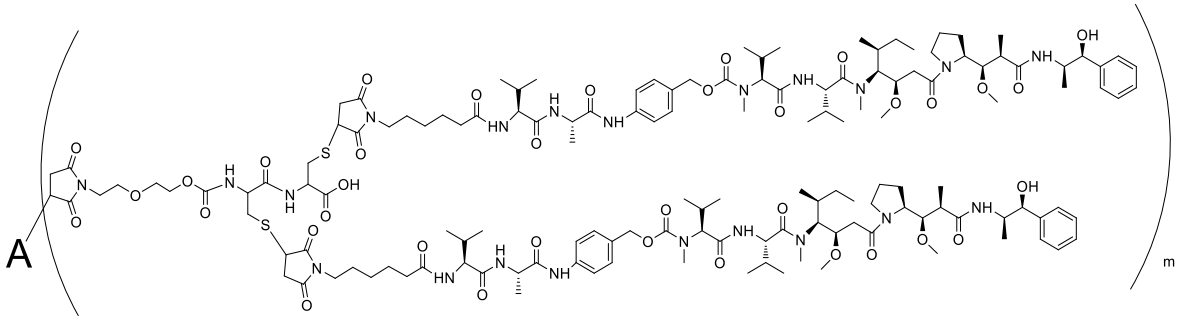
ADC-28



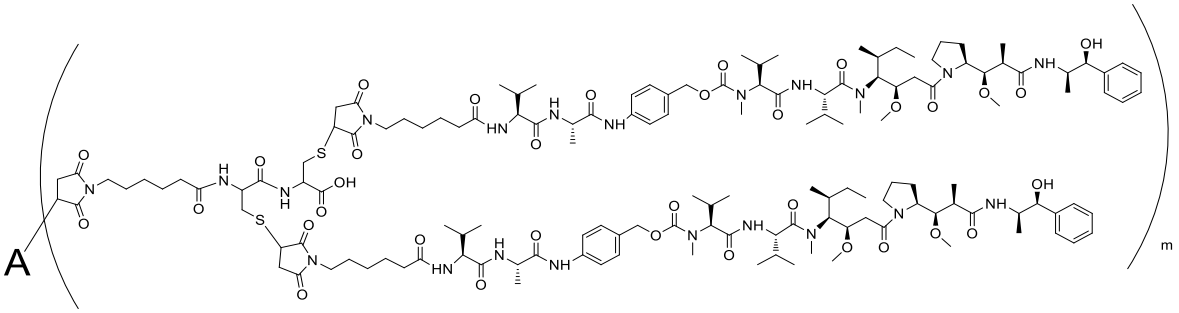
ADC-29



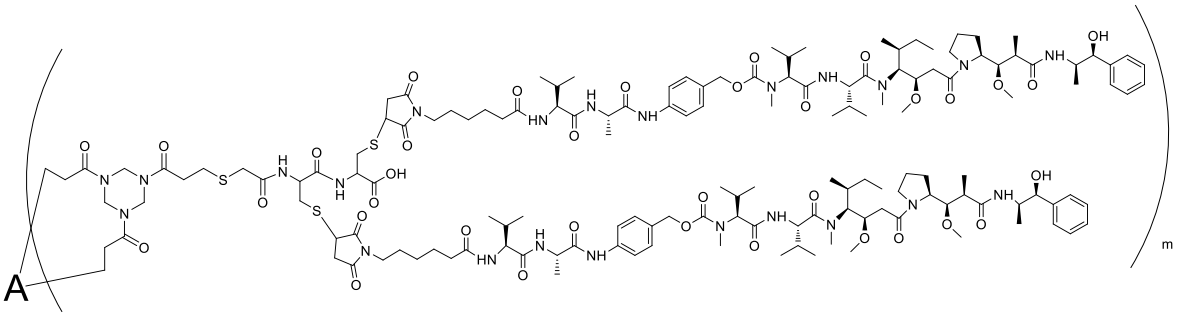
ADC-30



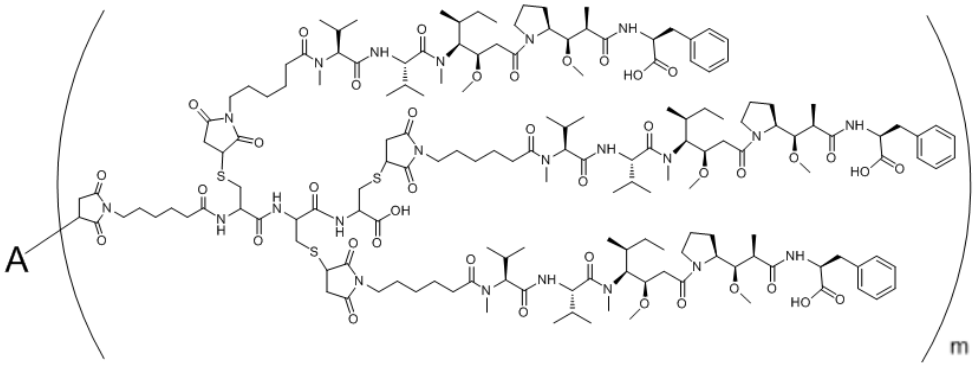
ADC-31



ADC-32



ADC-33
and



ADC-34

wherein

A is an antibody or a functional binding fragment thereof; and

m is selected from the group consisting of 1, 2, 3, 4, 5, 6, 7 and 8.

13. A pharmaceutical composition comprising an effective amount of the antibody-drug conjugate according to any one of claims 1 to 12, or a pharmaceutically acceptable salt or solvate thereof, together with a pharmaceutically acceptable excipient.