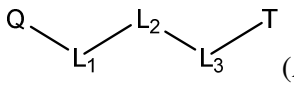
Claims

WHAT IS CLAIMED IS:

1. A compound, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein the compound comprises a structure represented by formula (A):



(A),

wherein, Q is a linking group,

L_1 comprises $-L_{1a}-C(=O)-$,

wherein, L_{1a} is selected from the group consisting of optionally substituted alkylene groups, optionally substituted polyethylene glycol groups, optionally substituted alkenylene groups, optionally substituted alkynylene groups, optionally substituted aliphatic cyclylene groups, optionally substituted aliphatic heterocyclylene groups, optionally substituted arylene groups, and optionally substituted heteroarylene groups;

L_2 comprises an optionally substituted polypeptide residue,

L_3 comprises an optionally substituted spacer group;

wherein, L_2 and/or L_3 comprise optionally substituted polysarcosine residues,

T comprises a drug unit.

2. The compound according to claim 1, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate

thereof,

wherein, Q comprises a group capable of coupling with mercapto.

3. The compound according to any one of claims 1-2, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, L_{1a} is selected from the group consisting of optionally substituted C_1-C_7 alkylene groups, optionally substituted diethylene glycol to octaethylene glycol groups, optionally substituted C_3-C_6 aliphatic cyclylene groups, optionally substituted arylene groups, and optionally substituted heteroarylene groups.

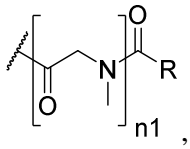
4. The compound according to any one of claims 1-3, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, L_2 comprises optionally substituted polypeptide residues composed of amino acids selected from the group consisting of glycine, phenylalanine, valine, alanine, arginine, citrulline, aspartic acid, asparagine and lysine.

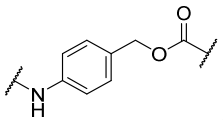
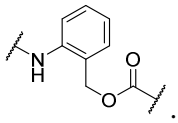
5. The compound according to any one of claims 1-4, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, when L_2 comprises a lysine residue, the lysine residue is substituted with a structure R_1 comprising a polysarcosine residue.

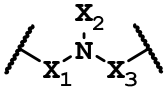
6. The compound according to claim 5, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the R_1 is optionally substituted , wherein n1 is a number from 4 to 18, and R is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 cycloalkyl, and C_1-C_6 alkoxy.

7. The compound according to any one of claims 1-6, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

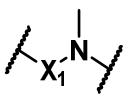
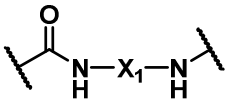
wherein, L_3 is selected from the group consisting of optionally substituted , and optionally substituted .

8. The compound according to any one of claims 1-7, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the benzene ring of L_3 is linked to the optionally substituted polysarcosine residue through a structural unit -X-, and the structural unit -X- is selected from the group consisting of optionally substituted , wherein X_1 is selected from the group consisting of carbonyl, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-

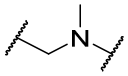
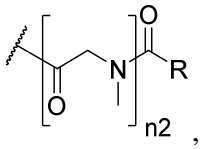
cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; wherein X_2 is selected from the group consisting of hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; wherein X_3 is a covalent bond or selected from the group consisting of hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; and the C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms are each independently optionally substituted with one or more substituents selected from deuterium, halogen, cyano, nitro, amino, alkyl, carboxy, alkoxy, or cycloalkyl.

9. The compound according to any one of claims 1-8, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

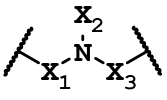
wherein, the benzene ring of L_3 is linked to the optionally substituted polysarcosine residue through a structural unit -X-, and the structural unit -X- is selected from the group consisting of optionally substituted , and optionally substituted , wherein X_1 is selected from the group consisting of C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S, and the C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising

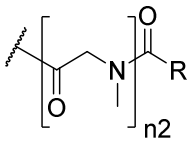
1-8 atoms are each independently optionally substituted with one or more substituents selected from deuterium, halogen, cyano, nitro, amino, alkyl, carboxy, alkoxy, or cycloalkyl.

10. The compound according to any one of claims 8-9, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the structural unit -X- is optionally substituted , and the optionally substituted polysarcosine residue comprises , wherein n2 is a number from 4 to 18, and R is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 cycloalkyl, and C_1-C_6 alkoxy.

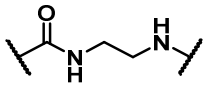
11. The compound according to any one of claims 8-10, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

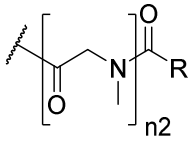
wherein, the structural unit -X- is selected from the group consisting of optionally substituted , wherein X_1 is selected from the group consisting of carbonyl, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; wherein X_2 is selected from the group consisting of hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; wherein X_3 is a covalent bond or selected from the group consisting of hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl,

linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; the C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms are each independently optionally substituted with one or more substituents selected from deuterium, halogen, cyano, nitro, amino, alkyl, carboxy, alkoxy, or cycloalkyl, and the optionally substituted polysarcosine residue comprises 

, wherein n2 is a number from 4 to 18, and R is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 cycloalkyl, and C_1-C_6 alkoxy.

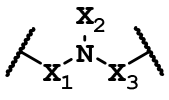
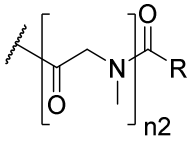
12. The compound according to any one of claims 8-9, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the structural unit -X- is optionally substituted 

, and the optionally substituted polysarcosine residue comprises 

, wherein n2 is a number from 4 to 18, and R is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 cycloalkyl, and C_1-C_6 alkoxy.

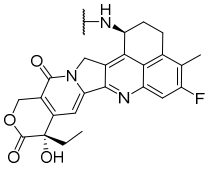
13. The compound according to any one of claims 8-9 and 12, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

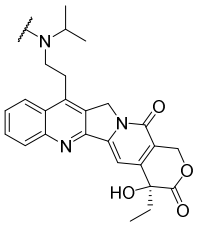
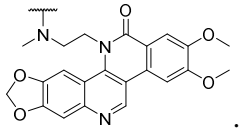
wherein, the structural unit -X- is selected from the group consisting of optionally substituted , wherein X_1 is selected from the group consisting of carbonyl, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; wherein X_2 is selected from the group consisting of hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; wherein X_3 is a covalent bond or selected from the group consisting of hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms, where the heteroalkyl comprises 1-3 atoms selected from N, O or S; the C_1-C_8 alkyl, C_1-C_8 alkoxy, C_1-C_6 cycloalkyl, linear heteroalkyl comprising 1-8 atoms, and linear-cyclic heteroalkyl comprising 1-8 atoms are each independently optionally substituted with one or more substituents selected from deuterium, halogen, cyano, nitro, amino, alkyl, carboxy, alkoxy, or cycloalkyl, and the optionally substituted polysarcosine residue comprises , wherein n2 is a number from 4 to 18, and R is selected from the group consisting of C_1-C_6 alkyl, C_1-C_6 cycloalkyl, and C_1-C_6 alkoxy.

14. The compound according to any one of claims 1-13, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, T comprises a compound with anti-tumor activity.

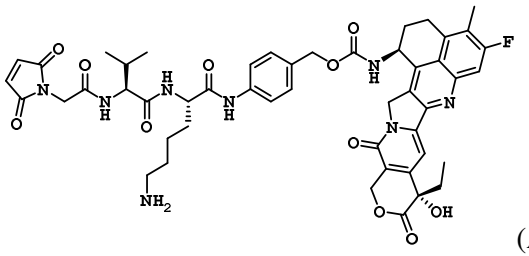
15. The compound according to any one of claims 1-14, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

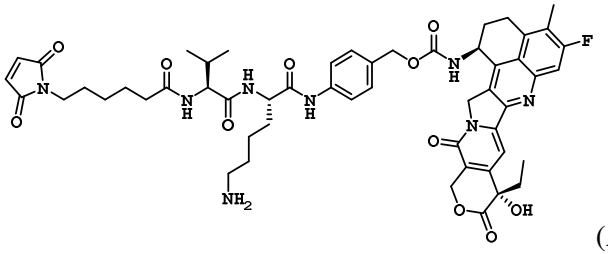
wherein, T is a structure selected from the group consisting of ,

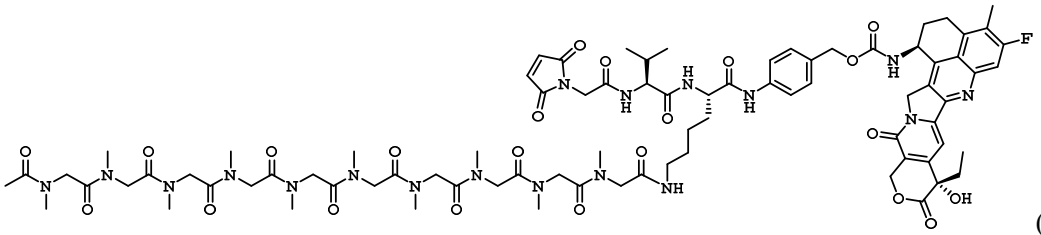
 and .

16. A compound, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the compound comprises a structure selected from the group consisting of

 (A-1),

 (A-2),



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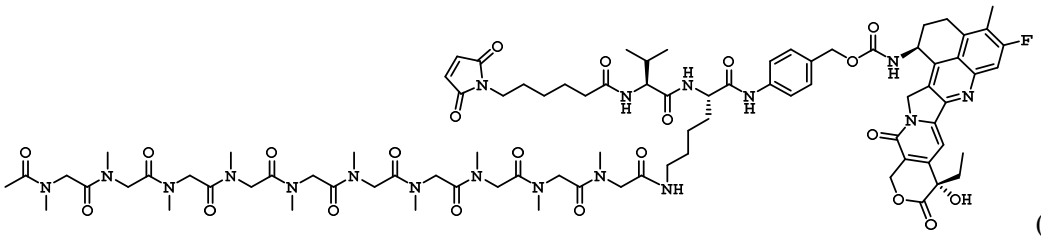

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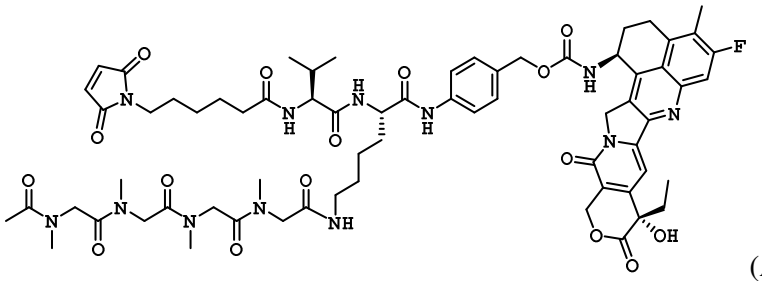

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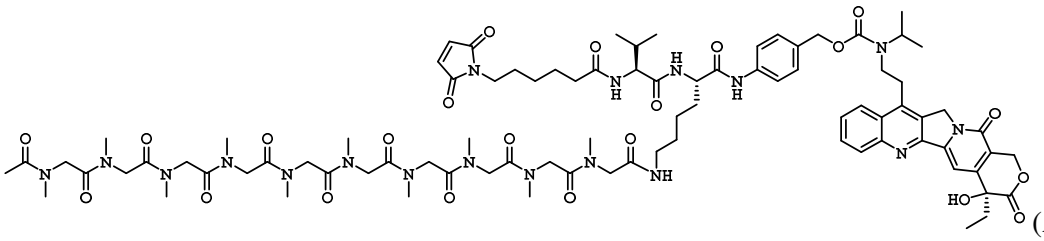

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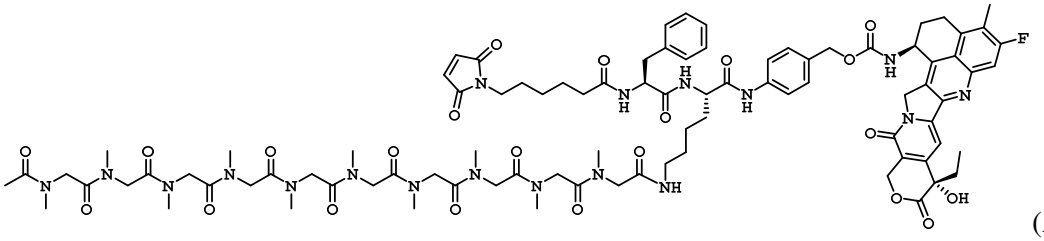

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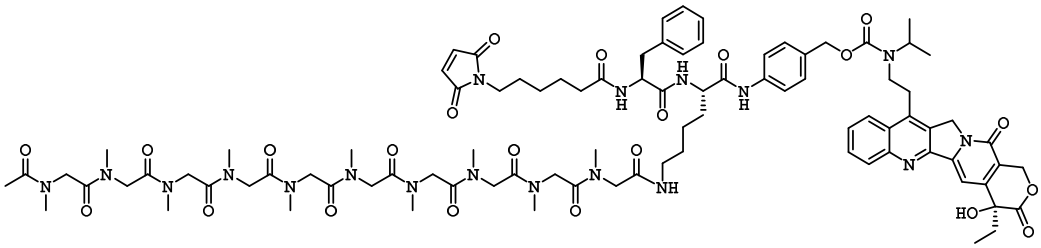

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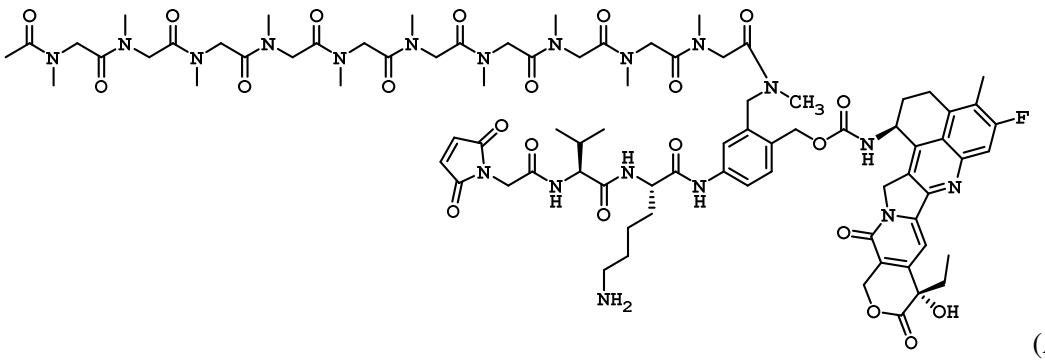

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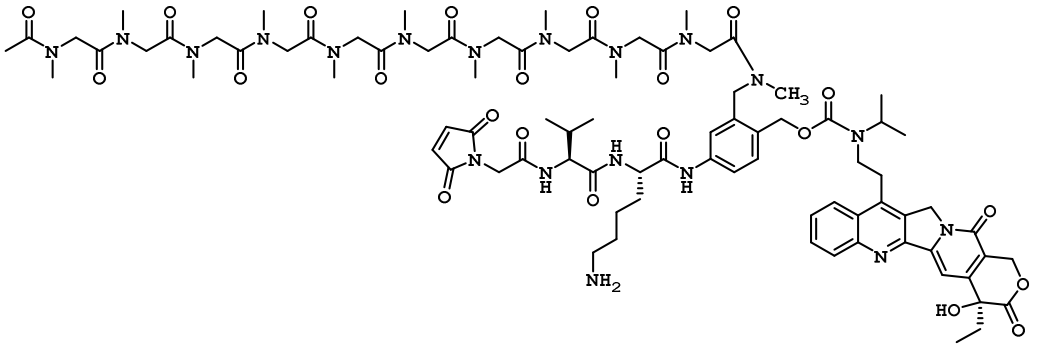

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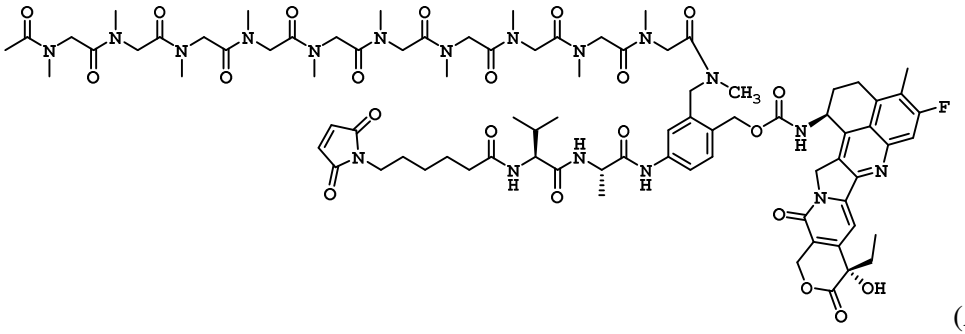

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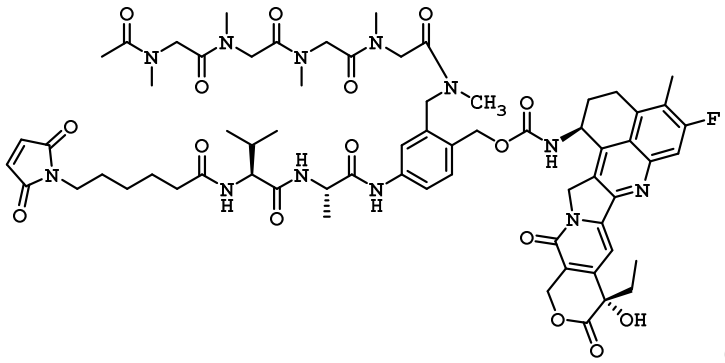

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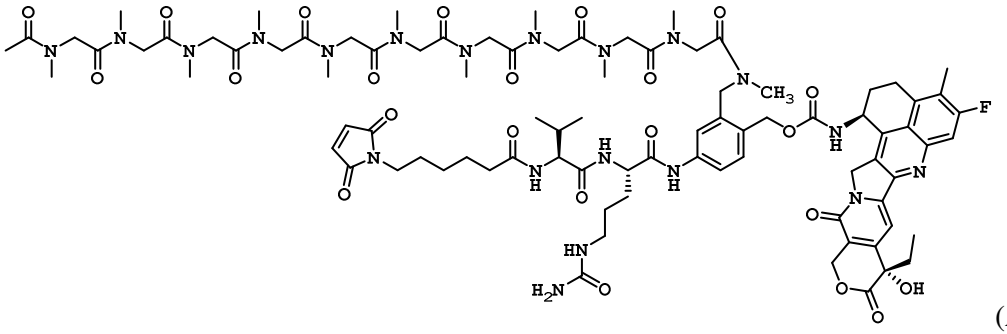

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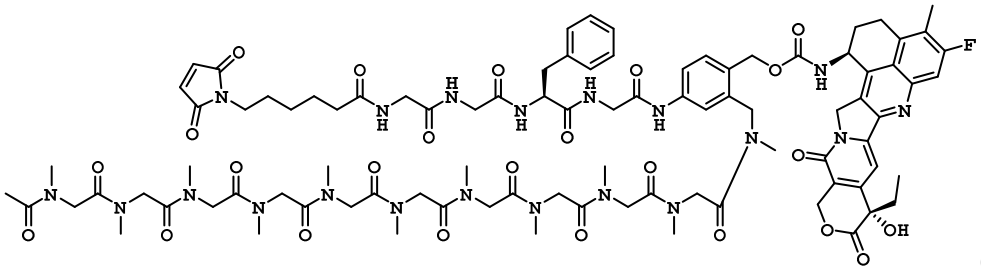

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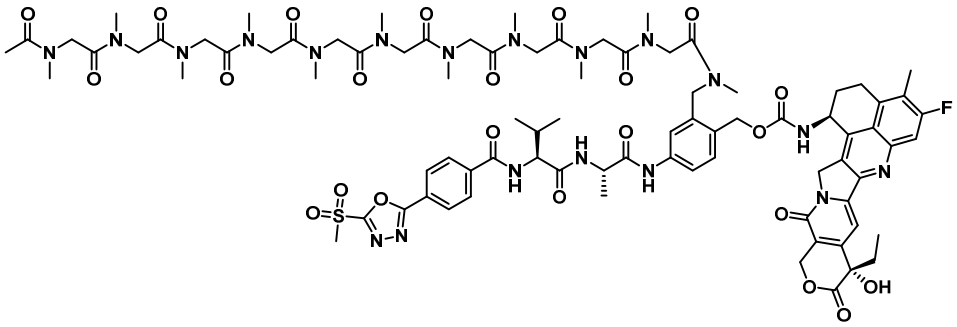

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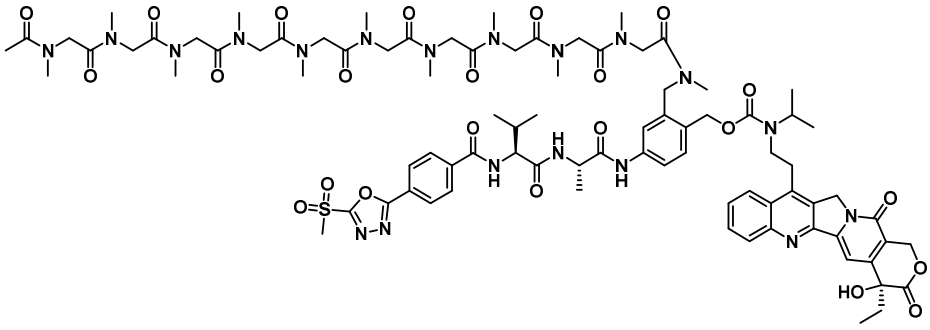

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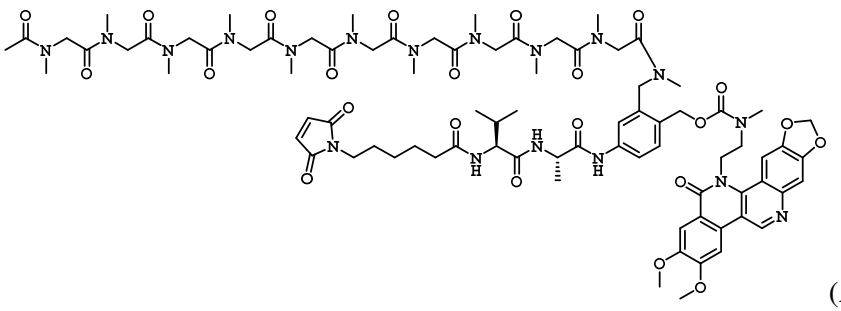

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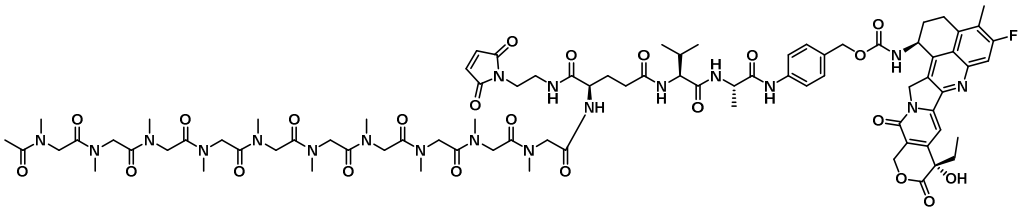

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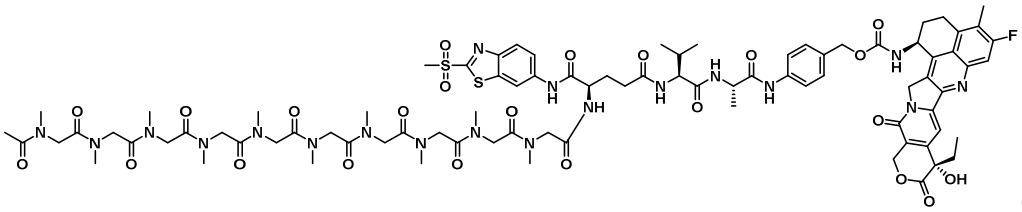

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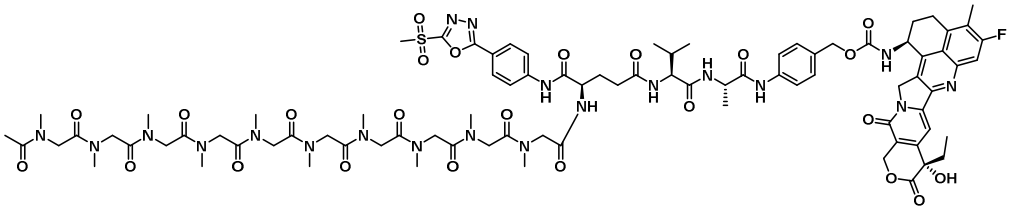

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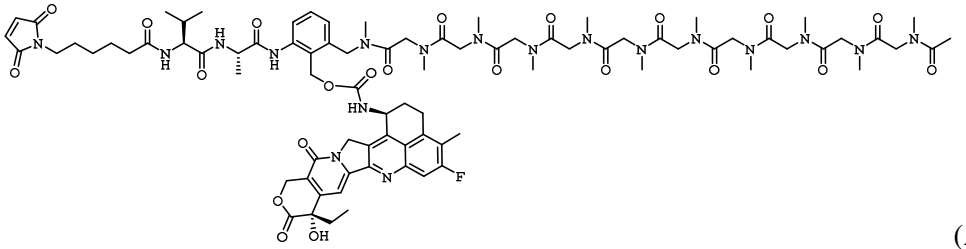

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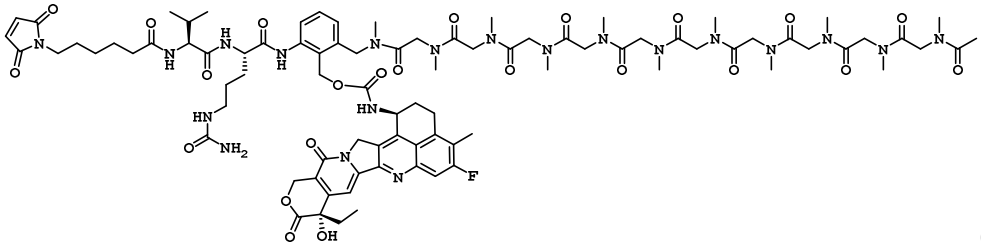

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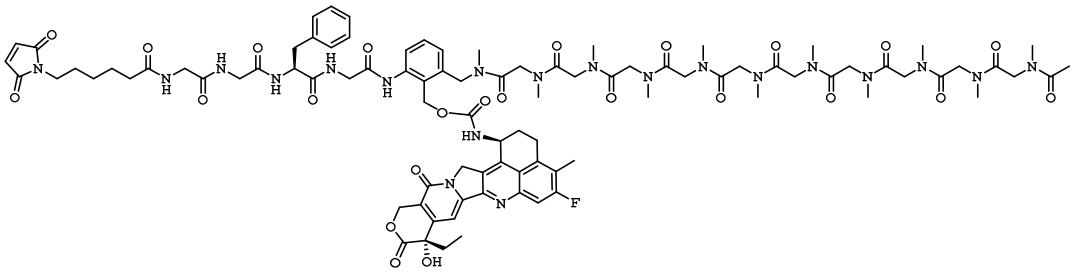

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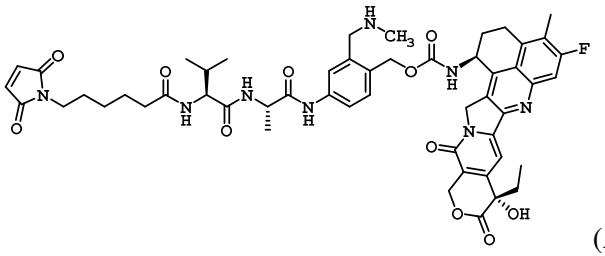

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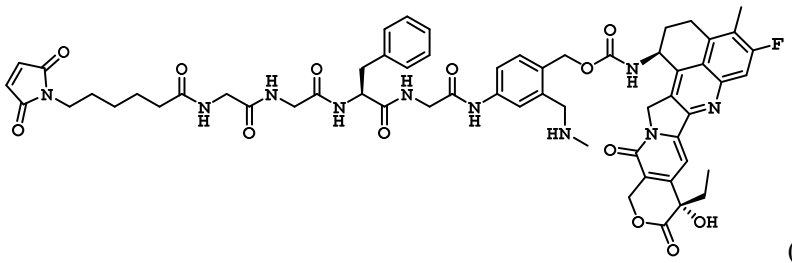

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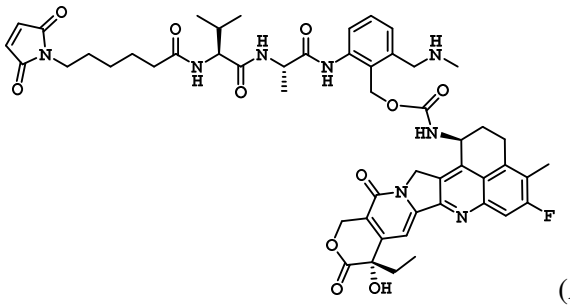

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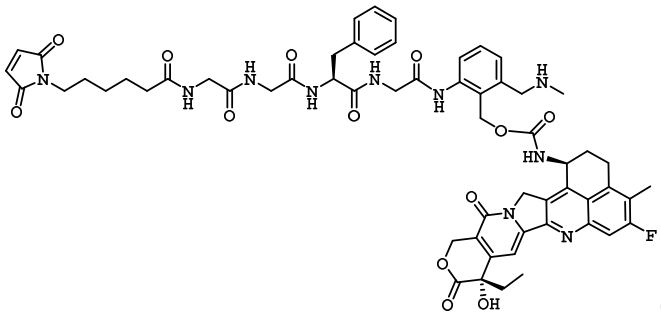

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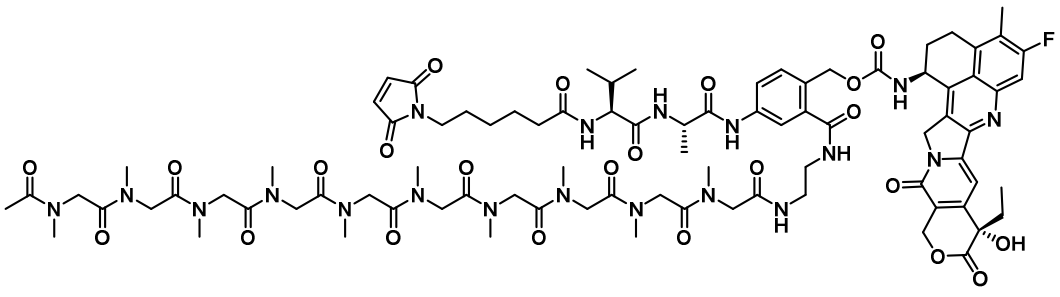
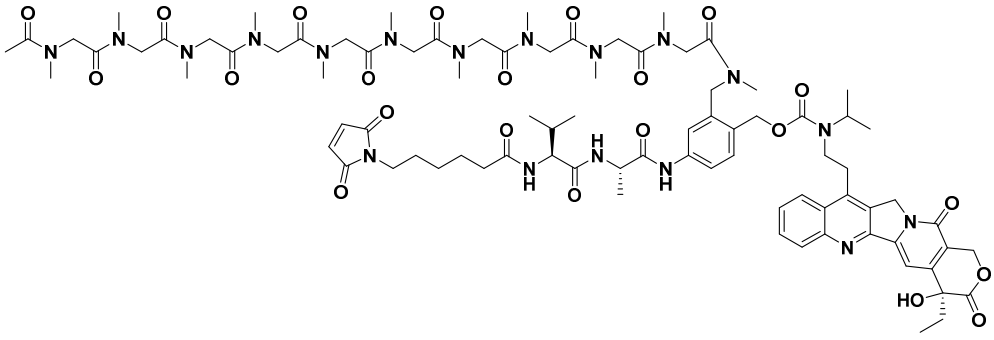
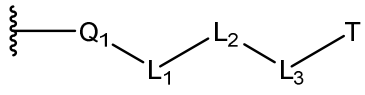


(A-28),

and


(A-29).

17. A compound, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein the compound comprises a structure represented by formula (B):


(B),

wherein, Q_1 comprises a linker,

L_1 comprises -L_{1a}-C(=O)-,

wherein, L_{1a} is selected from the group consisting of optionally substituted alkylene groups, optionally substituted polyethylene glycol groups, optionally substituted alkenylene groups, optionally substituted alkynylene groups, optionally substituted aliphatic cyclylene groups, optionally substituted aliphatic heterocyclylene groups, optionally substituted arylene groups, and optionally substituted heteroarylene groups;

L_2 comprises an optionally substituted polypeptide residue,

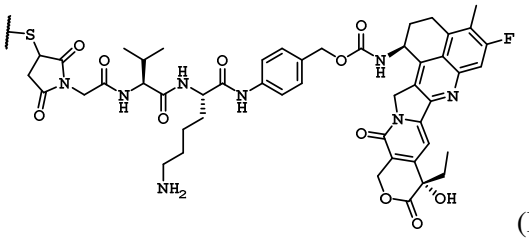
L_3 comprises an optionally substituted spacer group;

wherein, L_2 and/or L_3 comprise optionally substituted polysarcosine residues,

T comprises a drug unit.

18. A compound, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the compound comprises a structure selected from the group consisting of



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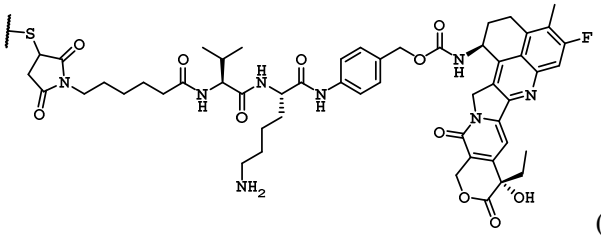

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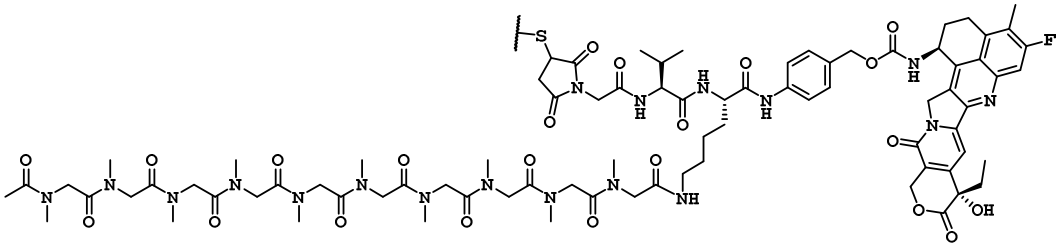

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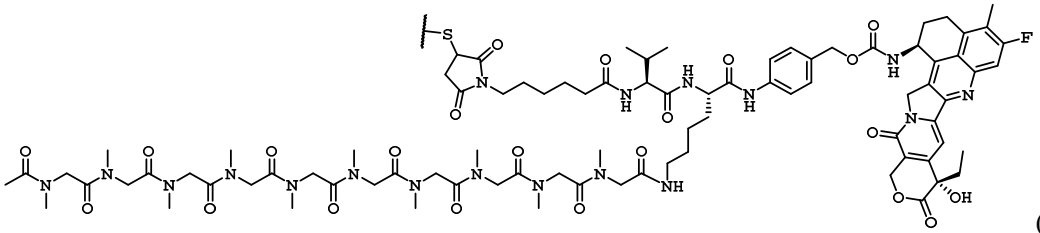

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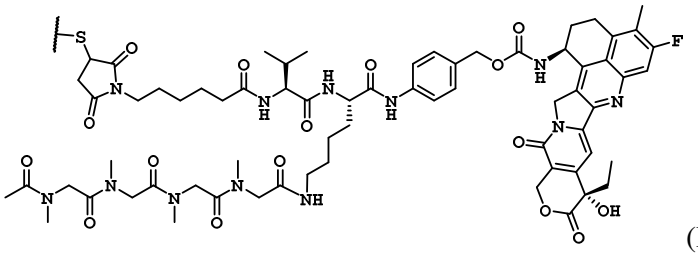

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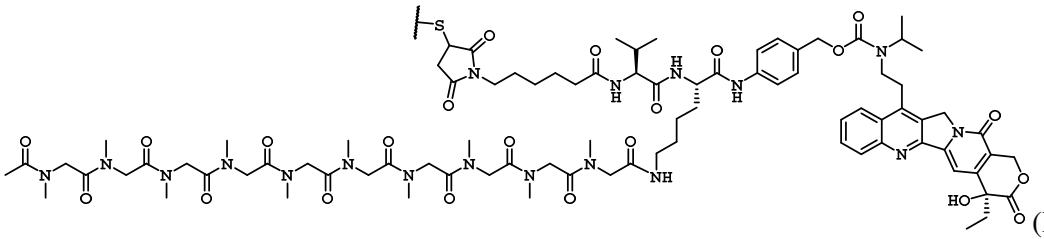

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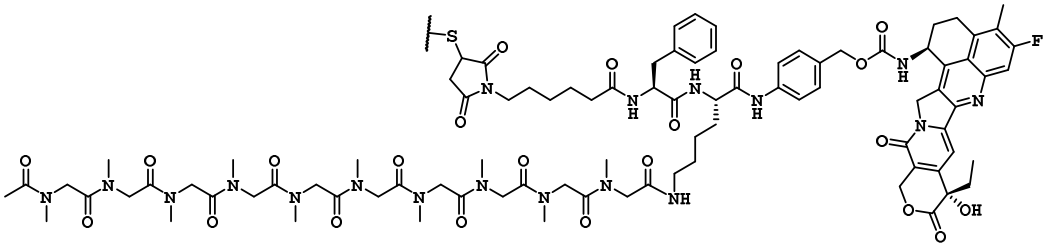

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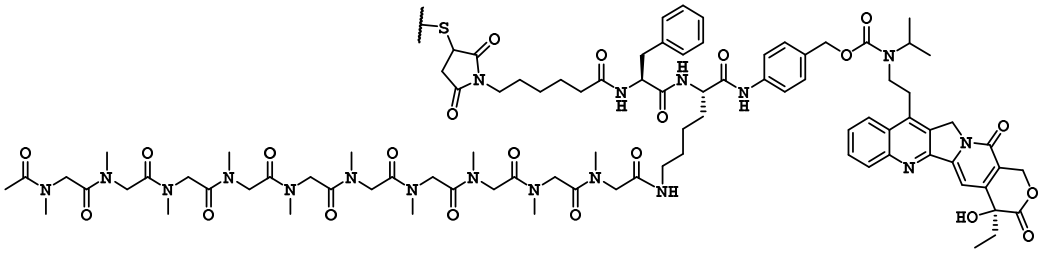

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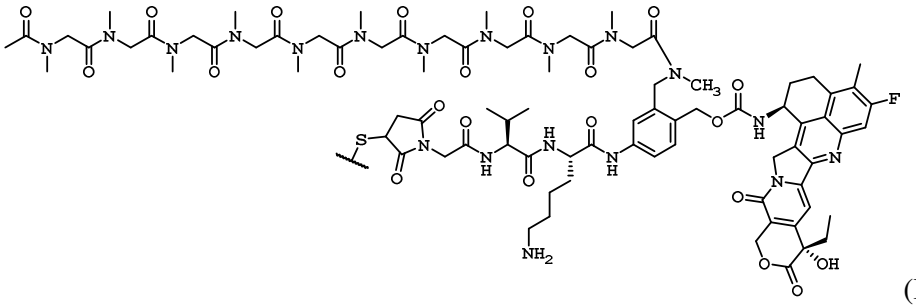

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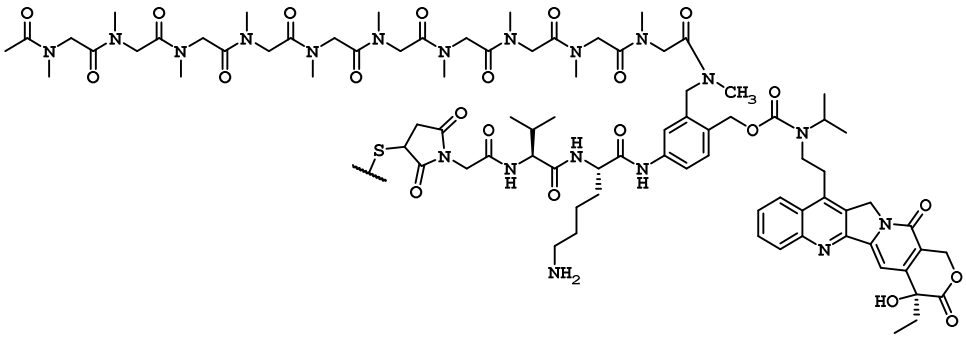

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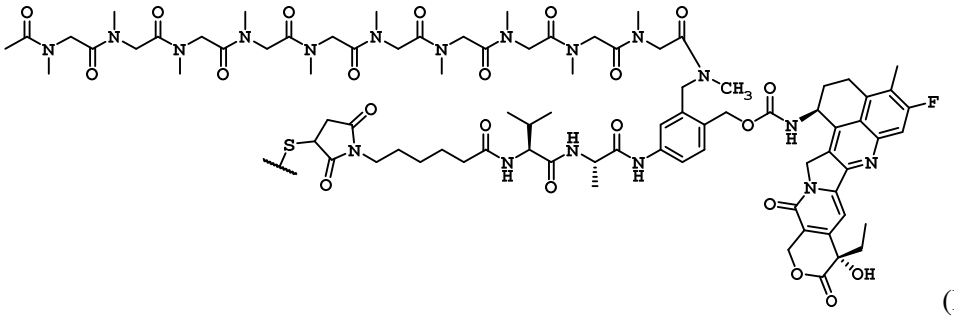

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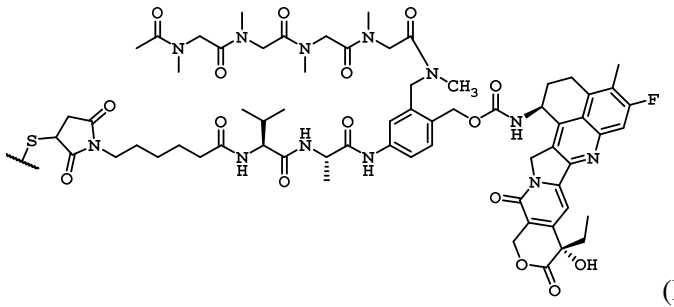

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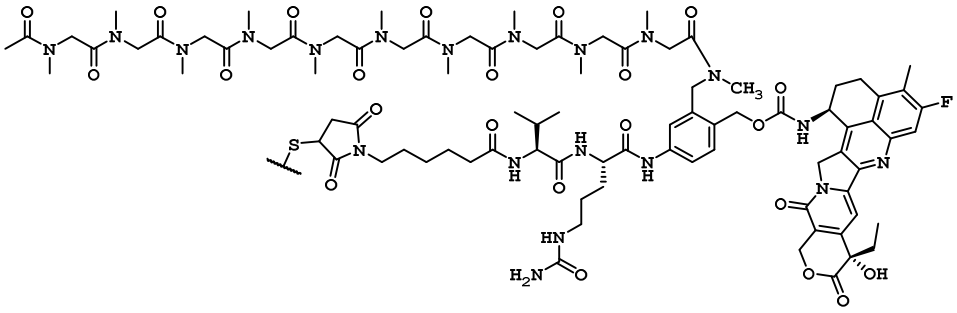

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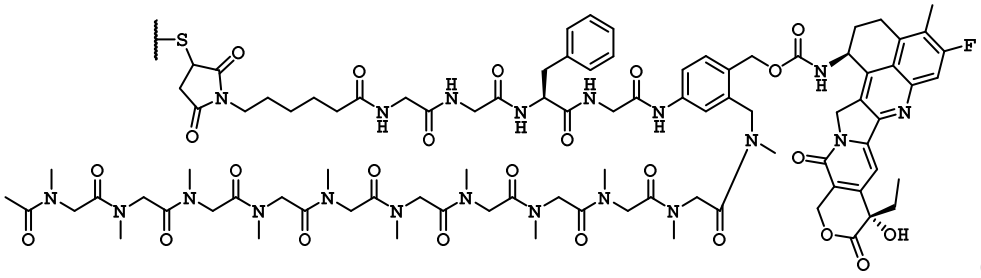

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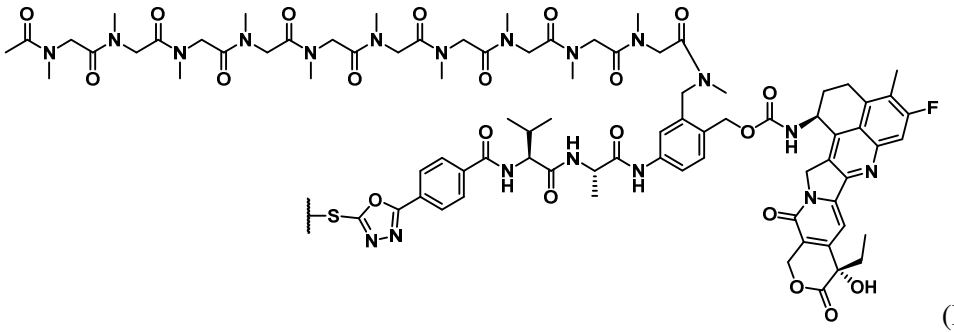

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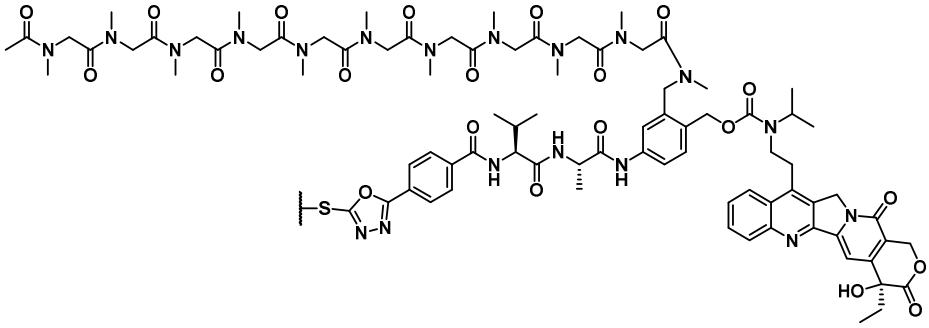

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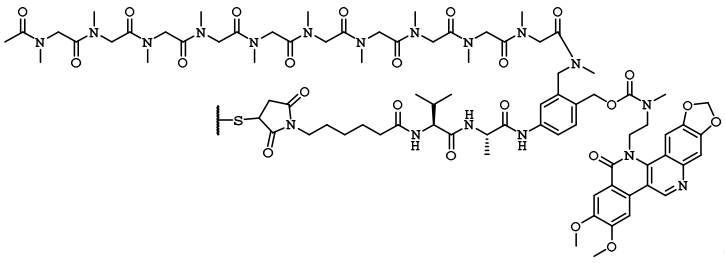

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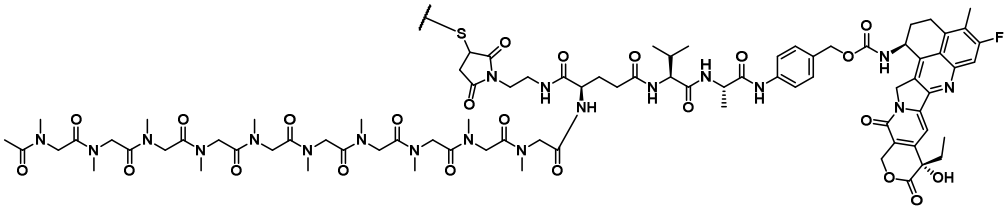

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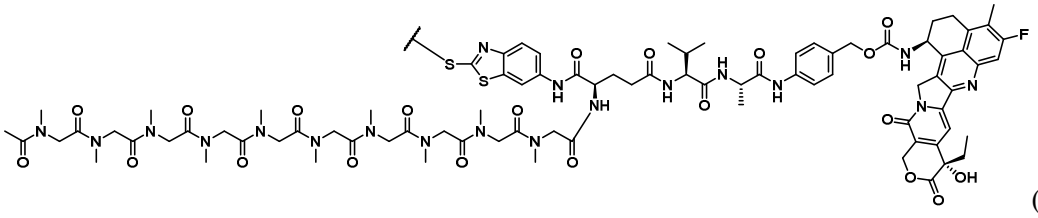

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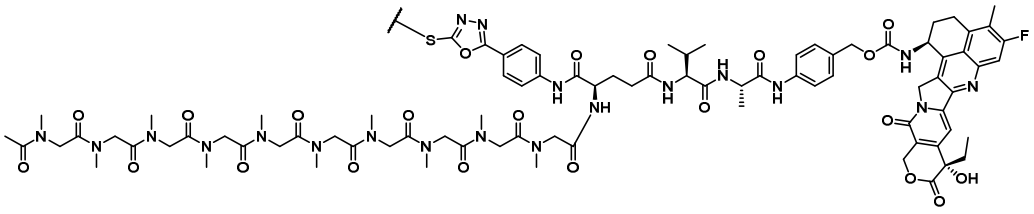

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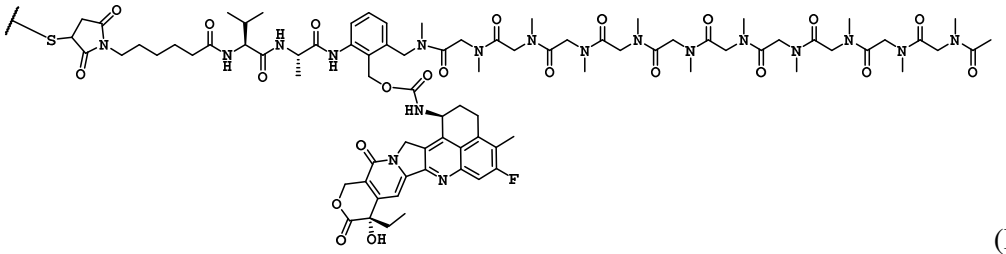

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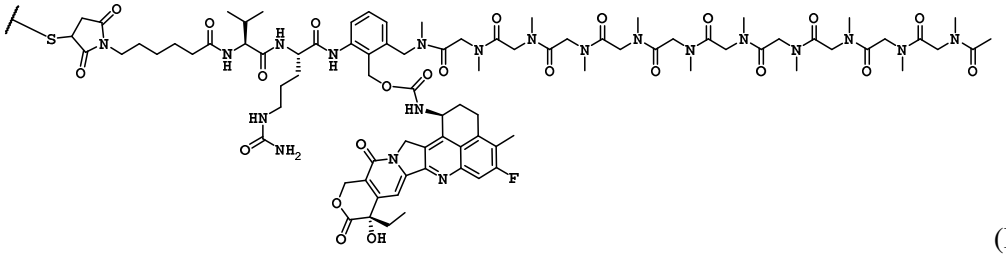

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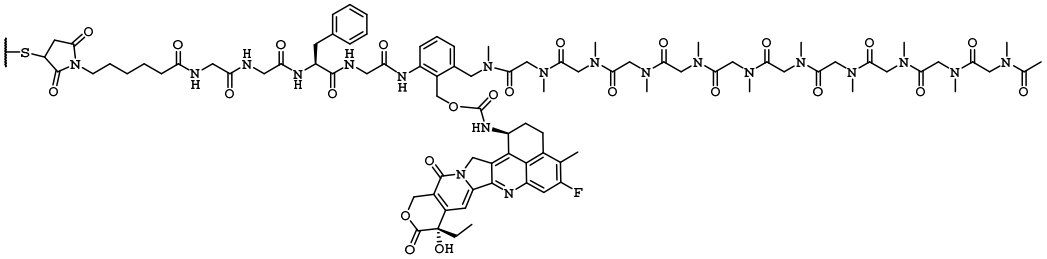

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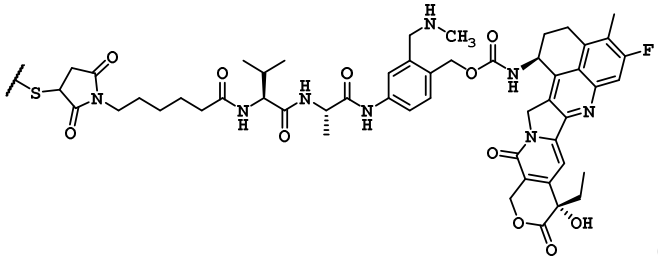

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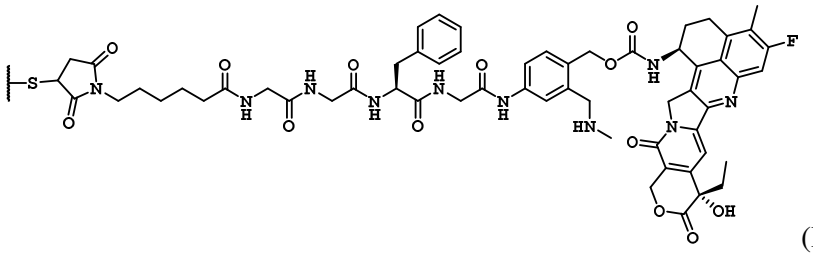

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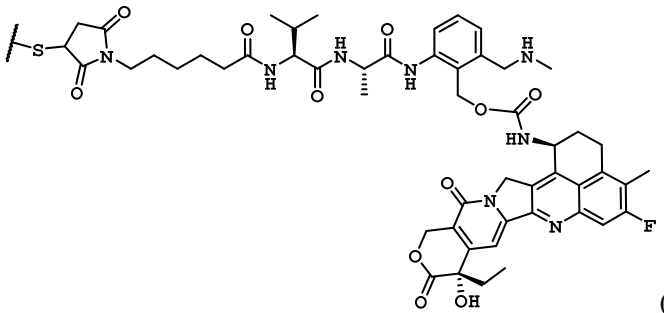

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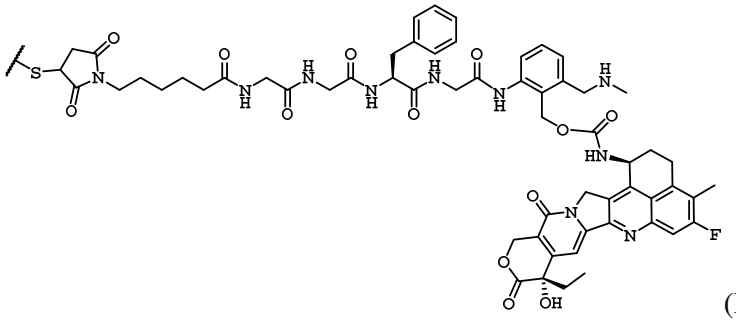

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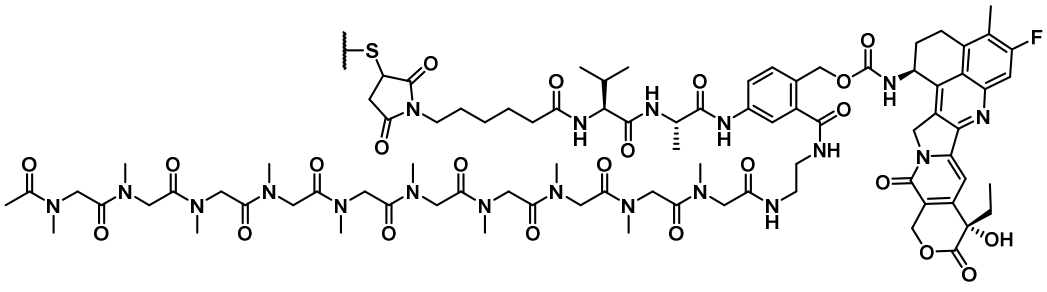
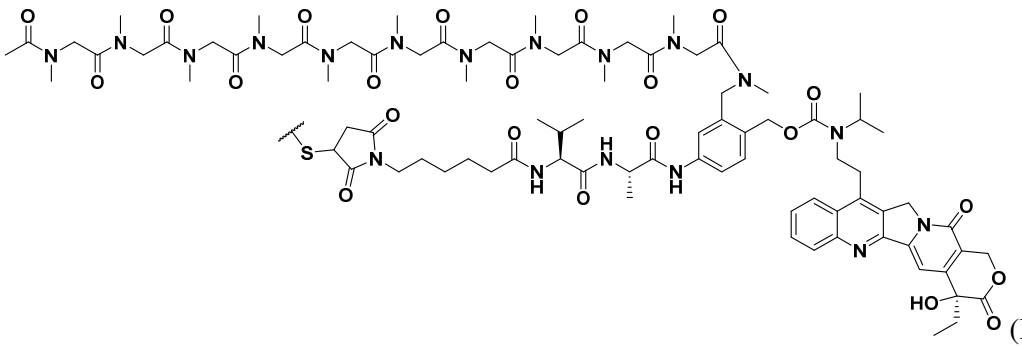
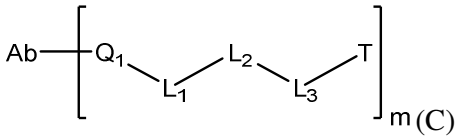


(B-28)

and


(B-29).

19. A compound, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein the compound comprises a structure represented by formula (C):


(C)

wherein, Q_1 comprises a linker,

L_1 comprises $-L_{1a}-C(=O)-$,

wherein, L_{1a} is selected from the group consisting of optionally substituted alkylene groups, optionally substituted polyethylene glycol groups, optionally substituted alkenylene groups, optionally substituted alkynylene groups, optionally substituted aliphatic cyclylene groups, optionally substituted aliphatic heterocyclylene groups, optionally substituted arylene groups, and optionally substituted heteroarylene groups;

L_2 comprises an optionally substituted polypeptide residue,

L_3 comprises an optionally substituted spacer group,

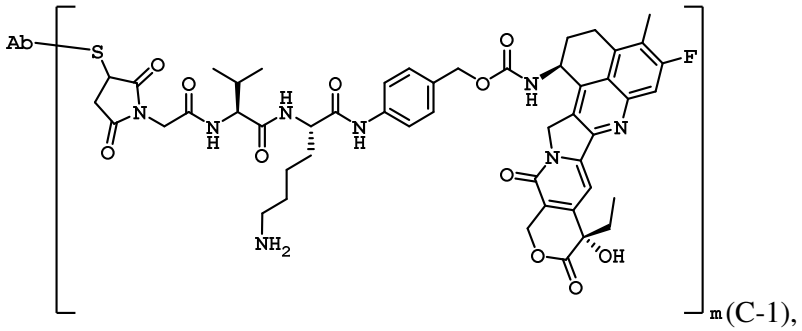
wherein, L_2 and/or L_3 comprise optionally substituted polysarcosine residues,

T comprises a drug unit,

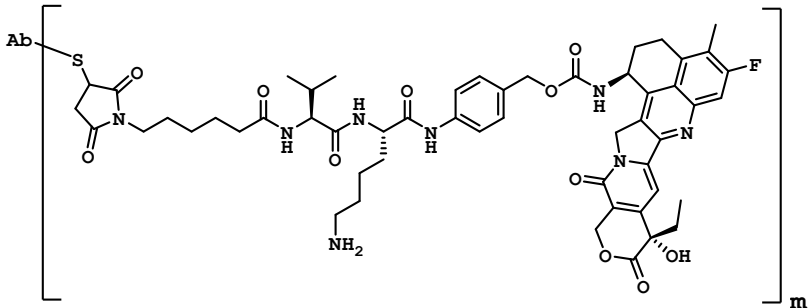
Ab is a ligand, and m is a number from 1 to 8.

20. A compound, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof,

wherein, the compound comprises a structure selected from the group consisting of



(C-1),



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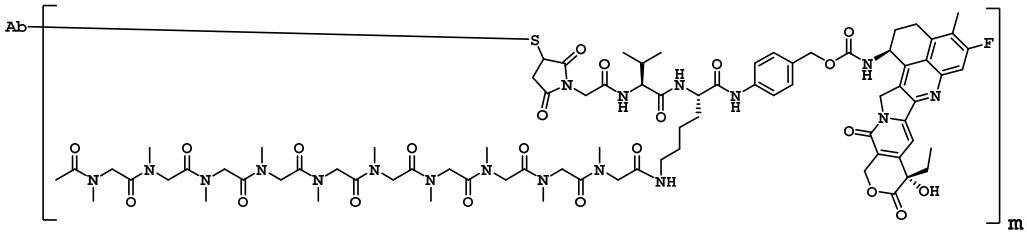

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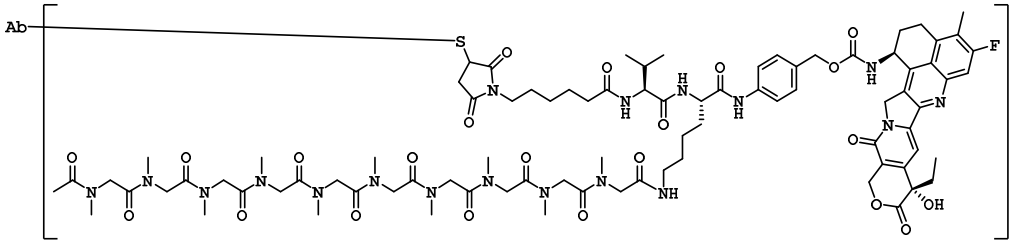

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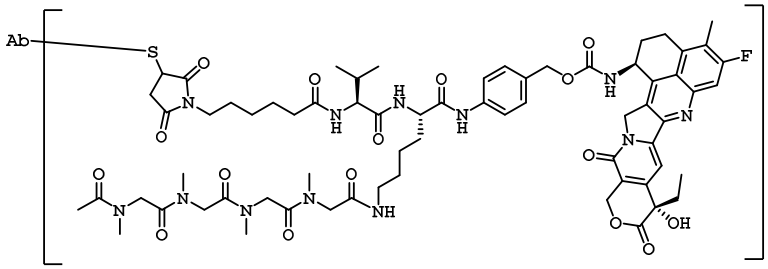

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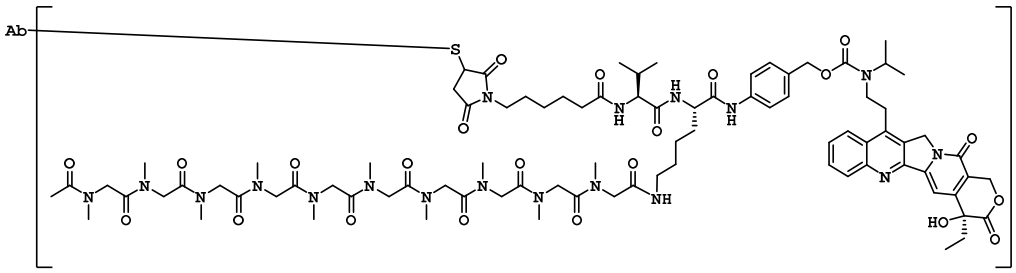

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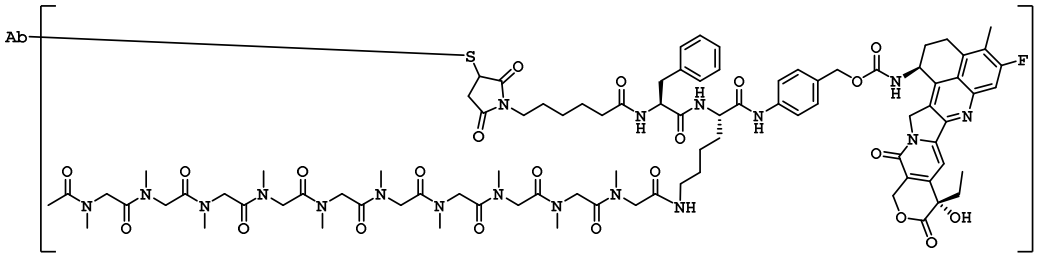

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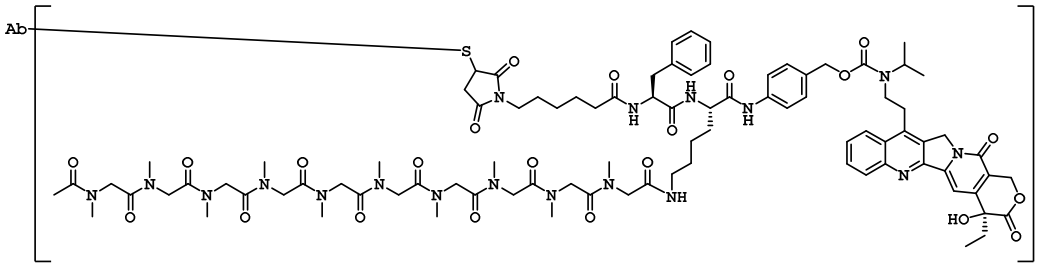

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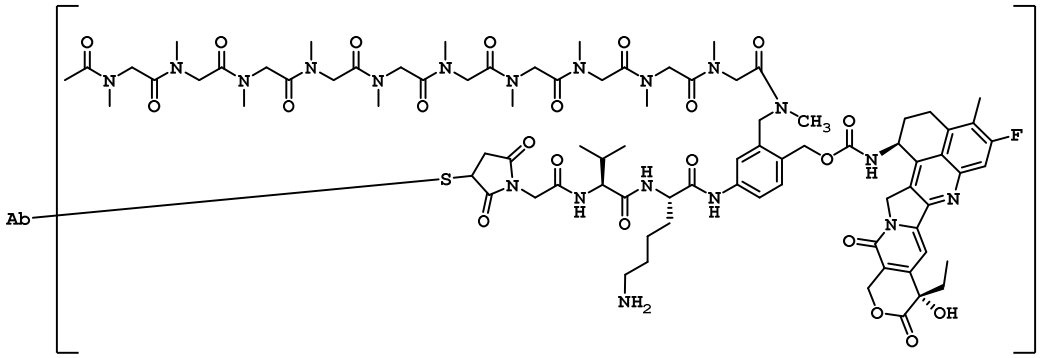

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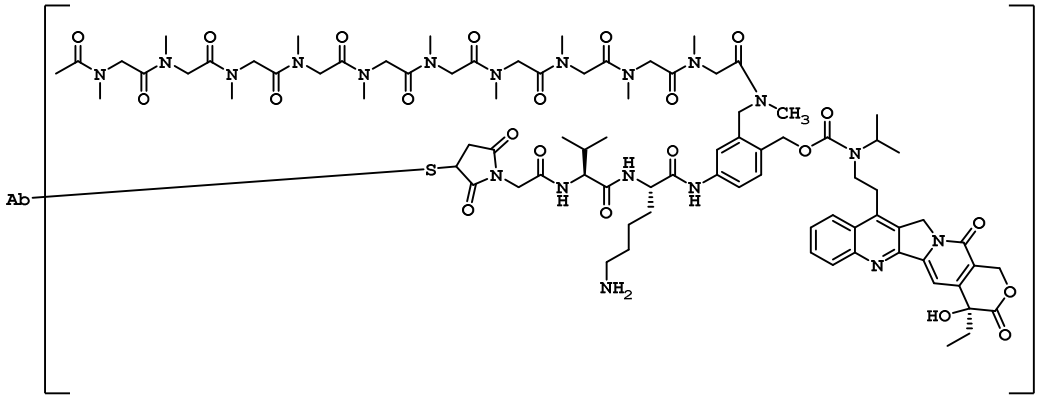

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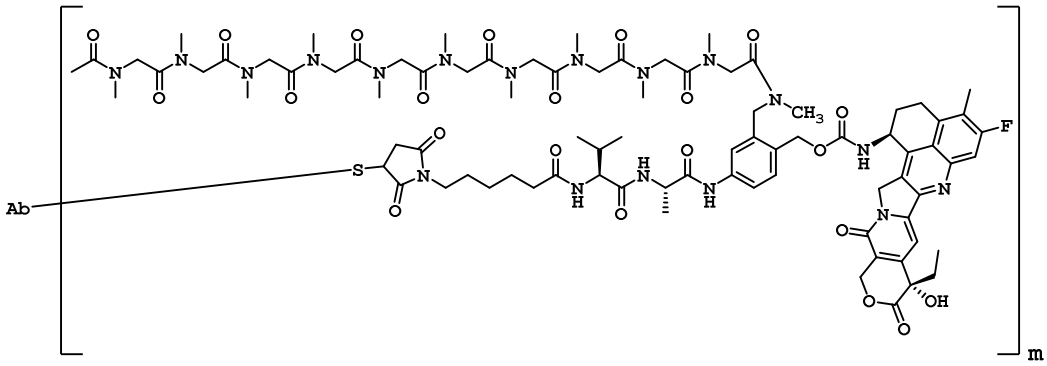

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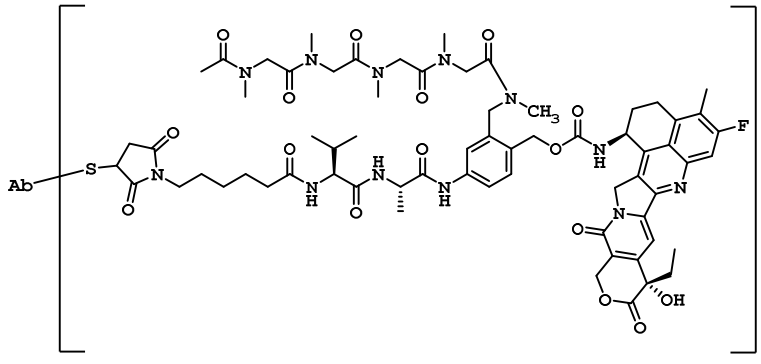

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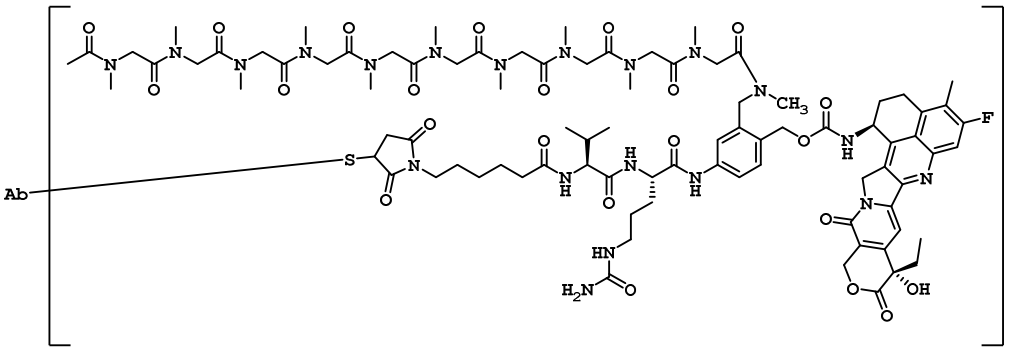

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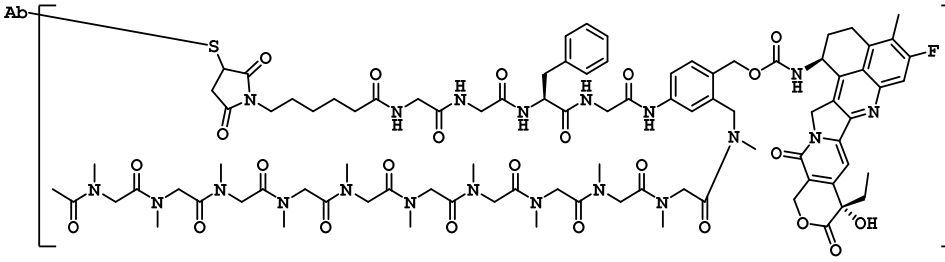

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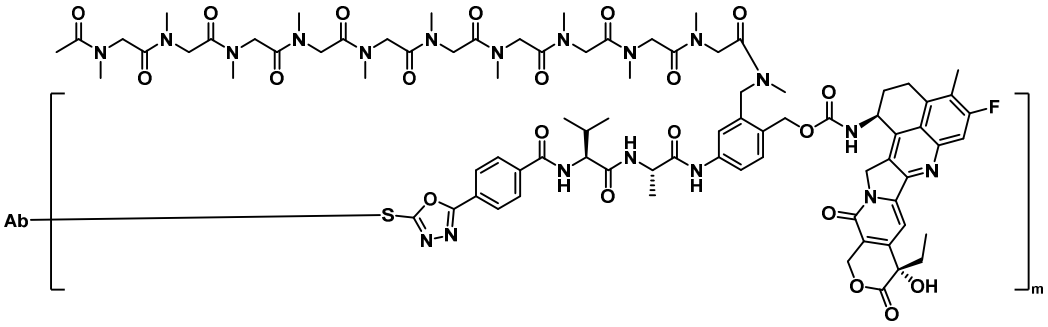
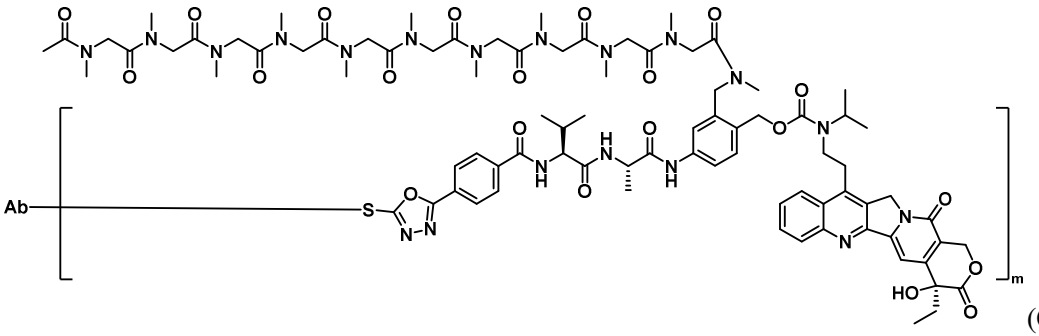


(C-15),



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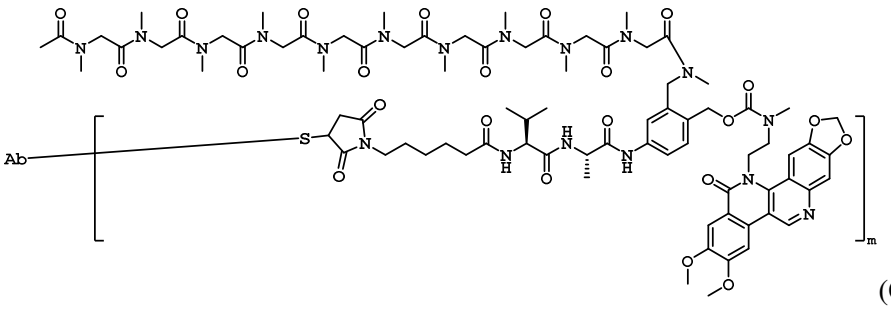

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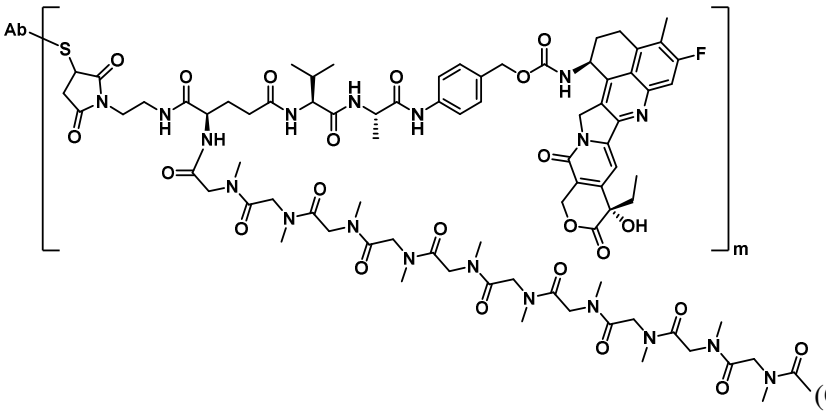

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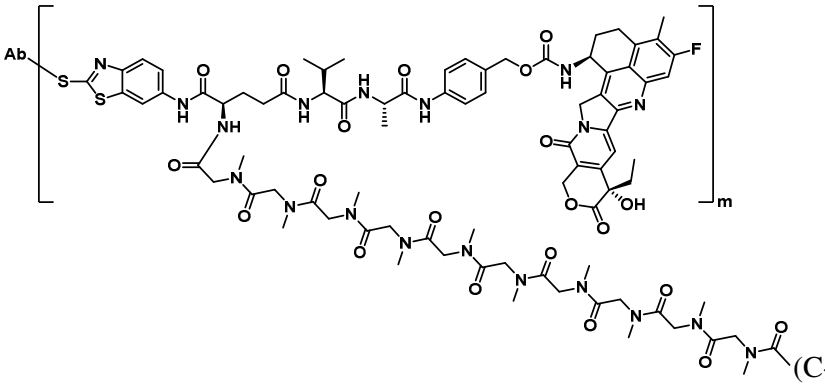

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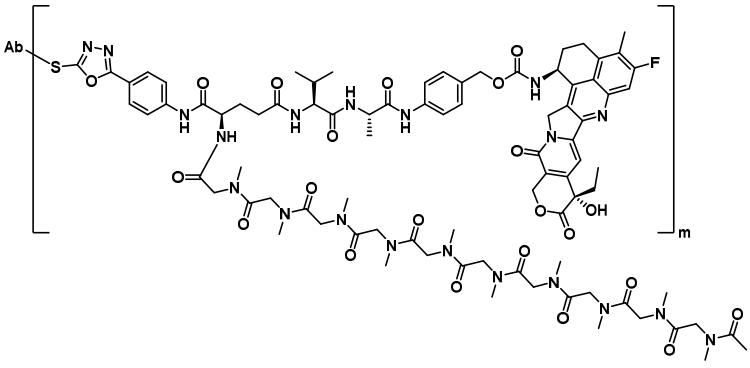
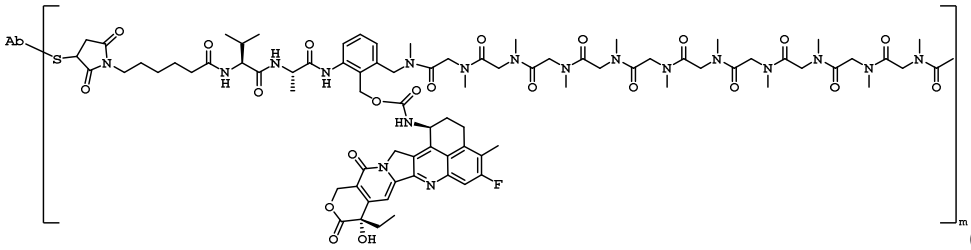


(C-20),



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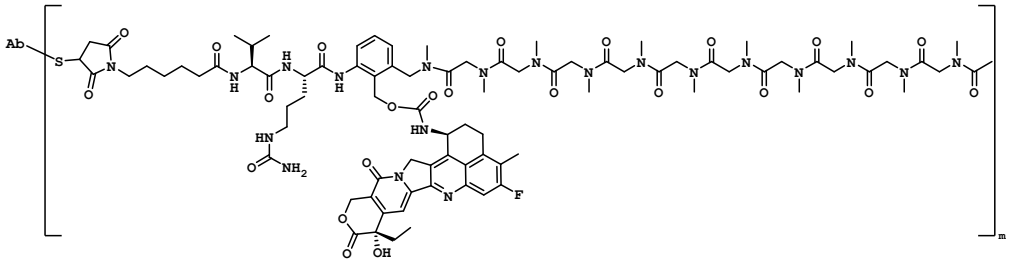
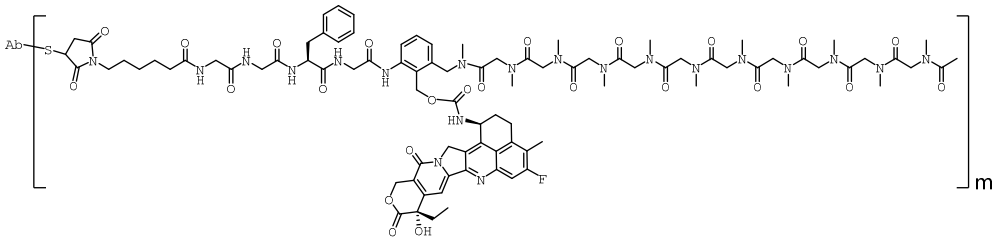


(C-22),



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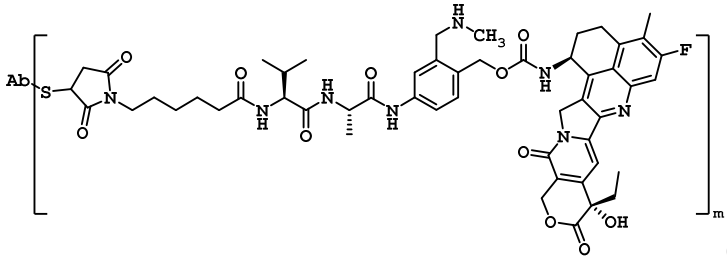
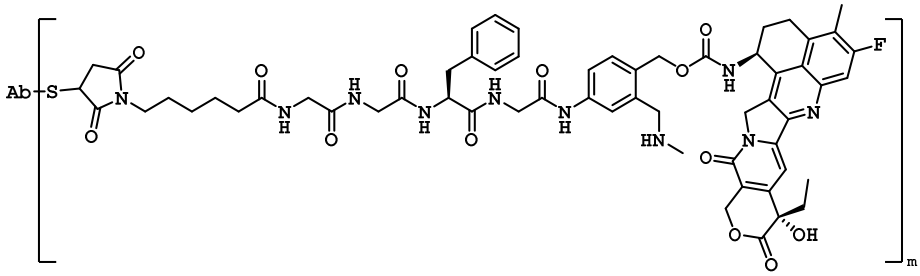


(C-24),



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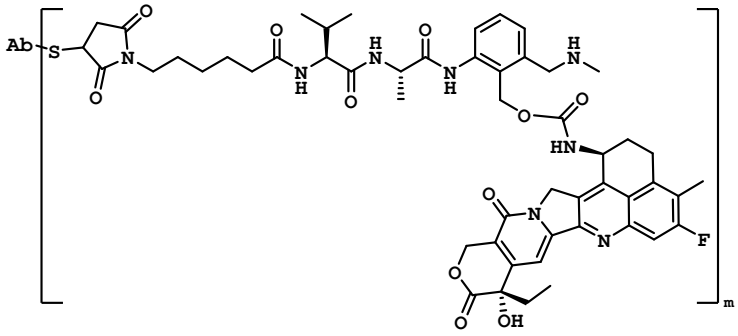
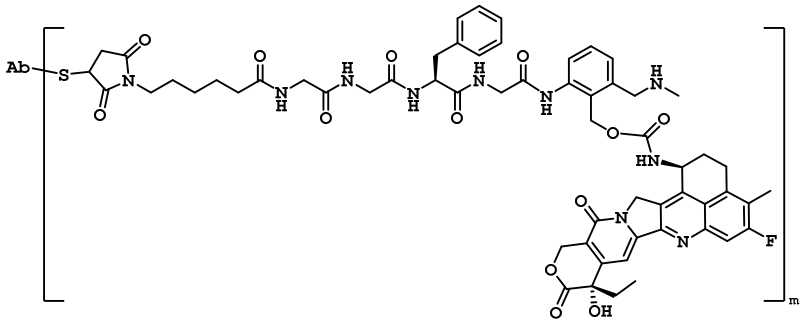
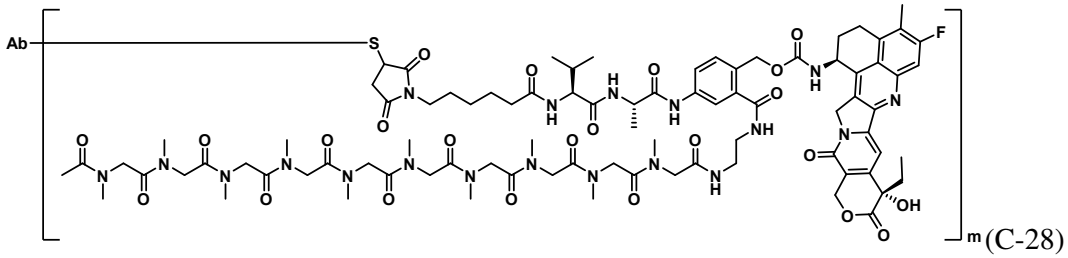


(C-26),

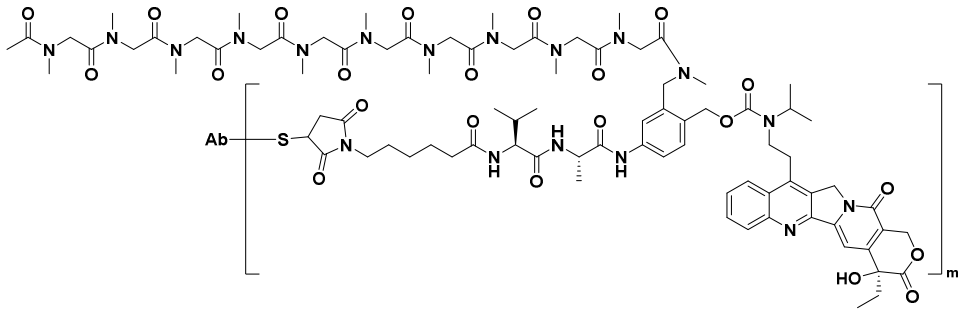


(C-27),



(C-28)

and



(C-29), Ab is a ligand, and m is a number from 1 to 8.

21. A pharmaceutical composition comprising the compound of any one of claims 1-20, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a

pharmaceutically acceptable salt, prodrug or solvate thereof, and optionally a pharmaceutically acceptable carrier.

22. Use of the compound of any one of claims 1-20, or a tautomer, mesomer, racemate, enantiomer, and diastereomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt, prodrug or solvate thereof, and/or the pharmaceutical composition according to claim 21 in the preparation of a drug for treating and/or preventing a tumor.