

~~What is claimed is:~~ Claims

1. An antibody drug conjugate, which has the formula of Ab-(L-D)_n, wherein:

(a) Ab is an antibody or a functional fragment thereof that specifically binds to MSLN;

(b) L is a linker or does not exist;

(c) D is a therapeutic agent; and

(d) n is 1, 2, 3, 4, 5, 6, 7, or 8.

wherein the antibody that specifically binds to MSLN is a humanized antibody and Ab comprises a heavy chain variable region and a light chain variable region, wherein

(i) the heavy chain variable region comprises VH CDR1, VH CDR2, and VH CDR3 having an amino acid sequence as set forth in SEQ ID NO: 1, 2 and 3, respectively; and

(ii) the light chain variable region comprises VL CDR1, VL CDR2, and VL CDR3 having an amino acid sequence as set forth in SEQ ID NO: 4, 5 and 6, respectively.

2. The antibody drug conjugate according to Claim 1, ~~wherein the antibody that specifically binds to MSLN comprises a heavy chain and a light chain,~~ wherein

(i) the heavy chain variable region comprises ~~three CDR regions, wherein the amino acid sequence of at least one of the CDR regions has~~ an amino acid sequence as set forth in SEQ ID NO: ~~1, 2 or 3~~ 7 or a sequence having at least ~~80~~ 90% sequence identity thereto; and

(ii) the light chain variable region comprises ~~three CDR regions, wherein the amino acid sequence of at least one of the CDR regions has~~ an amino acid sequence as set forth in SEQ ID NO: ~~4, 5 or 6~~ 8 or a sequence having at least ~~80~~ 90% sequence identity thereto

or wherein

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~~3. The antibody drug conjugate according to any one of claims 1 to 2, wherein the antibody that specifically binds to MSLN comprises a heavy chain variable region and a light chain variable region, wherein~~

(i) the heavy chain ~~variable region~~ comprises an amino acid sequence as set forth in SEQ ID NO: ~~7~~ 10 or a sequence having at least ~~80~~ 90% sequence identity thereto; and

(ii) the light chain ~~variable region~~ comprises an amino acid sequence as set forth in SEQ ID

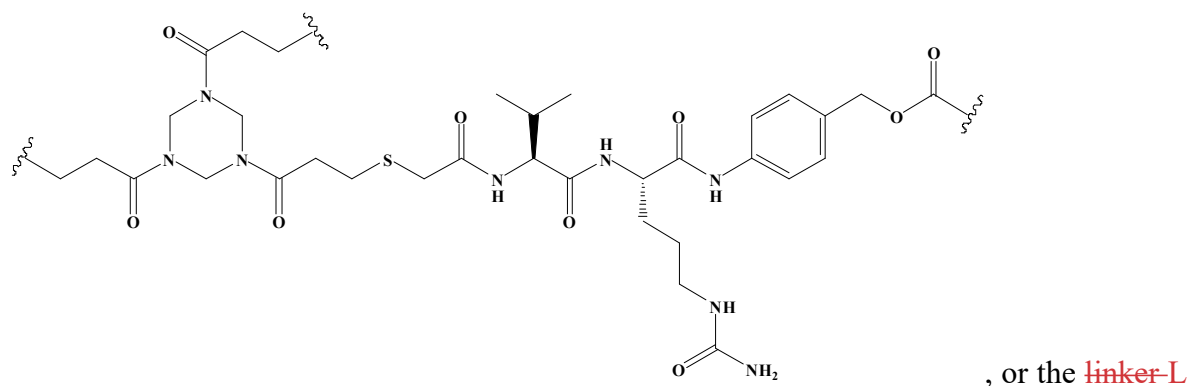
NO: 8 or a sequence having at least ~~80~~90% sequence identity thereto.

43. The antibody drug conjugate according to any one of claims 1 to 32, wherein the antibody is a ~~monoclonal antibody, a chimeric antibody, a humanized antibody, a single chain antibody (scFv) or a~~ bispecific antibody.

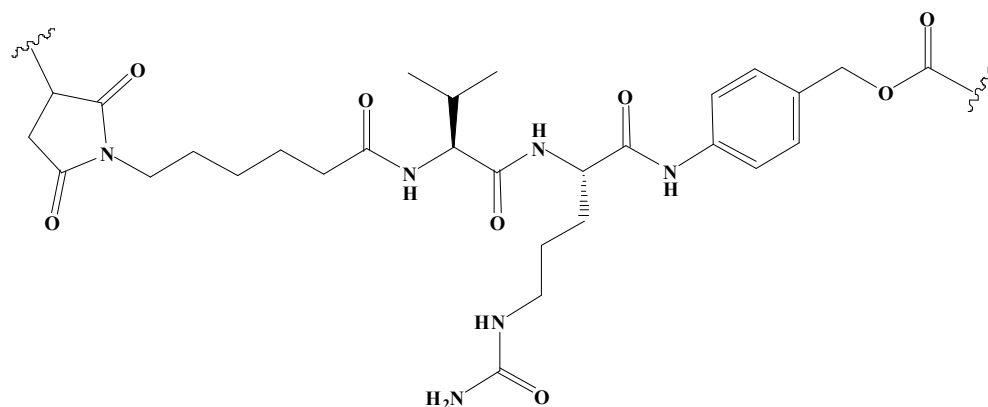
54. The antibody drug conjugate according to any one of claims 1 to 43, wherein the therapeutic agent is a dolastatin peptide, preferably MMAD, MMAE or MMAF, more preferably MMAE.

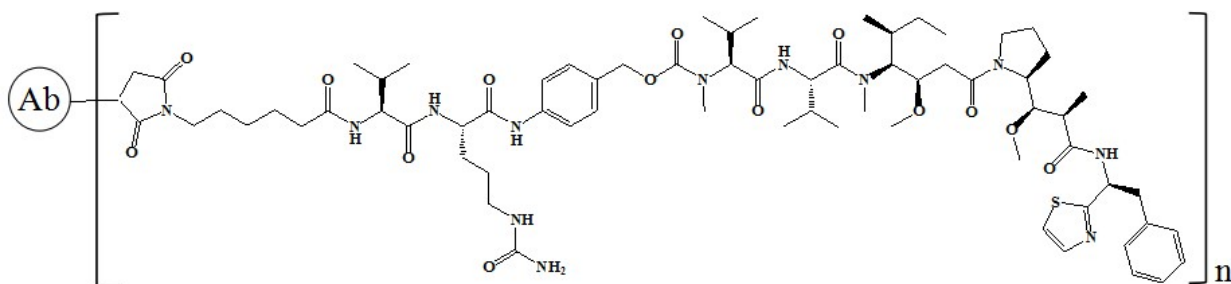
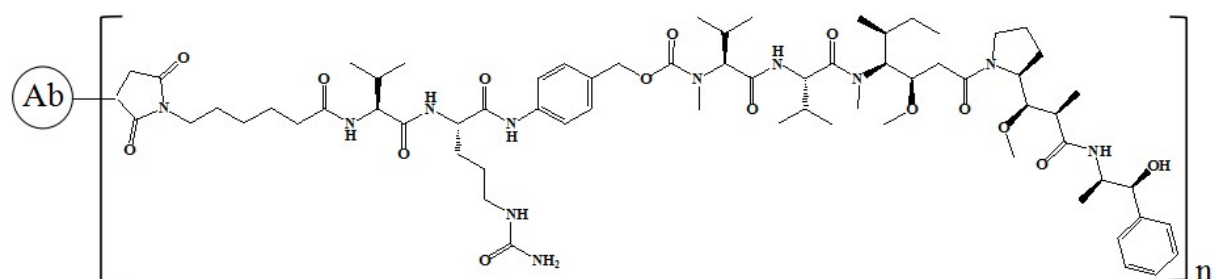
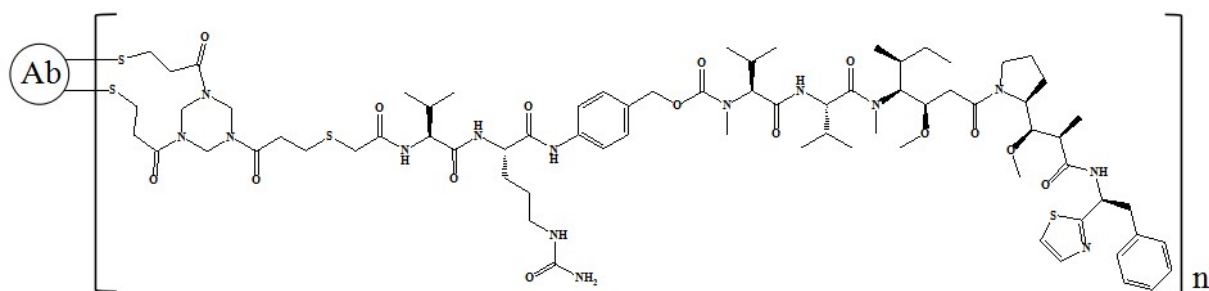
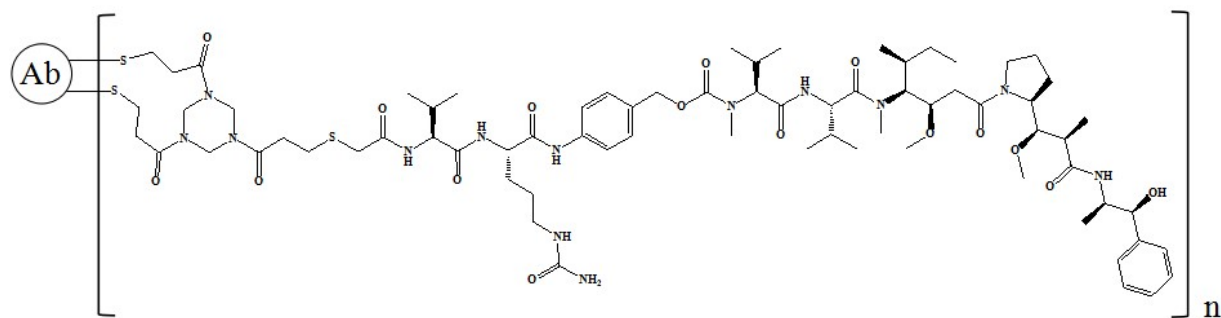
65. The antibody drug conjugate according to any one of claims 1 to 54, wherein ~~the linker~~ and the antibody L and Ab are linked by a thiol group on the antibody.

76. The antibody drug conjugate according to any one of claims 1 to 65, wherein the linker L has a structure as shown by the following formula:



has a structure as shown by the following formula:





~~80% sequence identity thereto;~~

(ii) the light chain variable region comprises ~~three CDR regions, the amino acid sequence of at least one of the CDR regions~~ VL CDR1, VL CDR2, and VL CDR3 having an amino acid sequence as set forth in SEQ ID NO: 4, 5 ~~or and 6, respectively or a sequence having at least 80% sequence identity thereto.~~

~~109.~~ The antibody or functional fragment thereof according to claim ~~98~~, wherein ~~the antibody comprises a heavy chain variable region and a light chain variable region;~~

(i) the heavy chain variable region comprises an amino acid sequence as set forth in SEQ ID NO: 7 or a sequence having at least ~~80~~90% sequence identity thereto;

(ii) the light chain variable region comprises an amino acid sequence as set forth in SEQ ID NO: 8 or a sequence having at least ~~80~~90% sequence identity thereto;

or wherein

~~(i) the heavy chain comprises an amino acid sequence as set forth in SEQ ID NO: 10 or a sequence having at least 90% sequence identity thereto; and~~

~~(ii) the light chain comprises an amino acid sequence as set forth in SEQ ID NO: 9 or a sequence having at least 90% sequence identity thereto.~~

~~110.~~ The antibody or functional fragment thereof according to any one of claims ~~9-8~~ to ~~109~~, wherein the antibody is ~~a monoclonal antibody, a chimeric antibody, a humanized antibody, a single chain antibody (scFv) or~~ a bispecific antibody.

~~1211.~~ An isolated polynucleotide, which encodes the antibody or functional fragment thereof according to any one of claims ~~9-8~~ to ~~1110~~.

~~13. A combination of isolated polynucleotides, which comprises: a polynucleotide encoding a heavy chain of the antibody or functional fragment thereof according to any one of claims 9 to 11, and a polynucleotide encoding a light chain of the antibody or functional fragment thereof according to any one of claims 9 to 11.~~

~~1412~~. An expression vector ~~or a combination of expression vectors~~, which comprises the polynucleotide according to claim ~~12-11 or the combination of polynucleotides according to claim 13~~, the polynucleotide being operably linked to a regulatory sequence allowing the expression of a polypeptide encoded thereby in a host cell or a cell-free expression system.

~~1513~~. A pharmaceutical composition, which comprises the conjugate according to any one of claims 1 to ~~8-7 and~~/or the antibody or functional fragment thereof according to any one of claims ~~9-8 to 1110~~, and a pharmaceutically acceptable carrier.

~~1614~~. Use of the conjugate according to any one of claims 1 to ~~87~~, the antibody or functional fragment thereof according to any one of claims ~~9-8 to 1110~~, the polynucleotide according to claim ~~1211, the polynucleotide combination according to claim 13~~, the expression vector according to claim ~~14-12~~ or the pharmaceutical composition according to claim ~~1513~~, in manufacture of a medicament for the treatment or prevention of ~~a cancer; preferably the cancer is~~ a mesothelin-positive cancer.