

CLAIMS

1. A conjugate comprising an antigen-binding protein and a cytotoxic agent or a chemotherapeutic agent, the antigen-binding protein comprising:
 - a. an HC CDR1 comprising the amino acid sequence of FTFSXYX (SEQ ID NO: 455), wherein X at position 5 is N, S, R, Q, or A and X at position 7 is W, H, Y, or F;
 - b. an HC CDR2 comprising the amino acid sequence of IRLKXDXYAT (SEQ ID NO: 456), wherein X at position 5 is S, N, A, or T and X at position 7 is Q, S, A, or N;
 - c. an HC CDR3 comprising the amino acid sequence of XDGPPSGX (SEQ ID NO: 457), wherein X at position 1 is N, D, A, or T and X at position 8 is S, T, A, C, or Y;
 - d. an LC CDR1 comprising the amino acid sequence of EXIYSY (SEQ ID NO: 476), wherein X is Q, S, A, D, or N;
 - e. an LC CDR2 comprising the amino acid sequence of XAK (SEQ ID NO: 477), wherein X at position 1 is Q, S, A, D, or N; and
 - f. an LC CDR3 comprising the amino acid sequence of QXHYXVPWT (SEQ ID NO: 454), wherein X at position 2 is H, Q, S, or T and X at position 5 is T, S, N, or G.
2. The conjugate of claim 1, wherein the antigen-binding protein comprises the amino acid sequence set forth in SEQ ID NO: 387 and SEQ ID NO: 389.
3. The conjugate of claim 1, wherein the antigen-binding protein comprises the amino acid sequence set forth in SEQ ID NO: 379 and SEQ ID NO: 383.
4. The conjugate of claim 3, wherein the chemotherapeutic agent is an anti-mitotic agent which inhibits cell division by blocking tubulin polymerization.
5. The conjugate of claim 4, wherein the anti-mitotic agent is an auristatin.

6. The conjugate of claim 5, wherein the auristatin is MMAE.
7. The conjugate of any one of claims 1-6, wherein the agent is conjugated to the antigen-binding protein via a cleavable linker.
8. The conjugate of claim 7, wherein the cleavable linker is VC-PAB-MMAE.
9. The conjugate of any one of claims 1-8, wherein the antigen-binding protein is an antibody.
10. The conjugate of claim 9, wherein the antibody is a monoclonal antibody, optionally wherein the monoclonal antibody is an IgG antibody.
11. The conjugate of claim 9 or 10, wherein the antibody is a human antibody, humanized antibody, or a chimeric antibody.
12. The conjugate of any one of claims 1-11, wherein an average number of units of the agent conjugated per antibody is in a range of 1 to 8, preferably wherein the average number of units of the agent conjugated per antibody is in a range of 3-8.
13. The conjugate of any one of claims 1-12, wherein the conjugate is a heterogeneous conjugate.
14. The conjugate of any one of claims 1-12, wherein the conjugate is a homogeneous conjugate.
15. The conjugate of any one of claims 1-12 and 14, wherein the agent is conjugated at a specific site of the antigen-binding protein.
16. The conjugate of claim 15, wherein the specific site is an unpaired cysteine residue.
17. The conjugate of any one of claims 9-16, wherein the conjugate comprises a polypeptide comprising the amino acid sequence set forth in SEQ ID NO: 387 and SEQ ID NO: 389 conjugated to MC-VC-PAB-MMAE.

18. The conjugate of any one of claims 9-16, wherein the conjugate comprises a polypeptide comprising the amino acid sequence set forth in SEQ ID NO: 379 and SEQ ID NO: 383 conjugated to MC-VC-PAB-MMAE.
19. A fusion protein comprising an antigen-binding protein of any one of the previous claims.
20. A nucleic acid comprising a nucleotide sequence encoding an antigen binding protein of any one of the previous claims, a conjugate of claim 1-18, or a fusion protein of claim 19.
21. A vector comprising the nucleic acid of claim 20.
22. A host cell comprising the nucleic acid of claim 20 or the vector of claim 21.
23. A method of producing an antigen-binding protein that binds to a Claudin6 (CLDN6) protein, comprising (i) culturing the host cell of claim 22 in a cell culture medium, wherein the host cell comprises a nucleic acid comprising a nucleotide sequence encoding an antigen binding protein of any one of the previous claims, and (ii) harvesting the antigen-binding protein from the cell culture medium.
24. A method of producing a fusion protein comprising an antigen-binding protein that binds to a Claudin6 (CLDN6) protein, comprising (i) culturing the host cell of claim 22 in a cell culture medium, wherein the host cell comprises a nucleic acid comprising a nucleotide sequence encoding a fusion protein of claim 5, and (ii) harvesting the fusion protein from the cell culture medium.
25. A method of producing a pharmaceutical composition comprising combining an antigen-binding protein as defined in any one of claims 1 to 18, a conjugate of any one of claims 1-18, a fusion protein of claim 19, a nucleic acid of claim 20, a vector of claim 21, a host cell of claim 22, or a combination thereof, and a pharmaceutically acceptable carrier, diluent or excipient.

26. A pharmaceutical composition comprising an antigen-binding protein as defined in any one of claims 1 to 18, a conjugate of any one of claims 1-18, a fusion protein of claim 18, a nucleic acid of claim 20, a vector of claim 21, a host cell of claim 60, and a pharmaceutically acceptable carrier, diluent or excipient.
27. A method of detecting Claudin6 (CLDN6) in a sample, comprising contacting the sample with an antigen-binding protein as defined in any one of claims 1 to 18, a conjugate of any one of claims 1-18, or a fusion protein of claim 19, and assaying for an immunocomplex comprising the antigen-binding protein, conjugate or fusion protein bound to CLDN6.
28. A method of diagnosing a Claudin6 (CLDN6)-positive cancer in a subject, comprising contacting a biological sample comprising cells or tissue obtained from the subject with an antigen-binding protein as defined in any one of claims 1 to 18, a conjugate of any one of claims 1-18, or a fusion protein of claim 19, and assaying for an immunocomplex comprising the antigen-binding protein, conjugate or fusion protein bound to CLDN6.