WHAT IS CLAIMED IS:

1. An isolated antibody that binds to Ly6E, wherein the antibody comprises (i) HVR-L1 comprising the amino acid sequence of SEQ ID NO:7, (ii) HVR-L2 comprising the amino acid sequence of SEQ ID NO:8, (iii) HVR-L3 comprising the amino acid sequence of SEQ ID NO:9, (iv) HVR-H1 comprising the amino acid sequence of SEQ ID NO:10, v) HVR-H2 comprising the amino acid sequence of SEQ ID NO:11, and (vi) HVR-H3 comprising the amino acid sequence of SEQ ID NO:12.

2. The antibody of claim 1, which is a monoclonal antibody.

3. The antibody of claim 1 or claim 2, which is a humanized or chimeric antibody.

4. The antibody of any one of claims 1-3, which is an antibody fragment.

5. The antibody of any one of claims 1-4, comprising (a) a VH sequence having at least 95% sequence identity to SEQ ID NO:32; (b) a VL sequence having at least 95% sequence identity to the amino acid sequence of SEQ ID NO:31; or (c) a VH sequence as in (a) and a VL sequence as in (b).

6. The antibody of claim 5, comprising a VH sequence of SEQ ID NO:32 and a VL sequence of SEQ ID NO: 31.

7. An isolated antibody comprising a VH sequence SEQ ID NO:32 and a VL sequence of SEQ ID NO:31.

8. The antibody of any one of claims 1-7, which is an IgG1, IgG2a, IgG2b, IgG3, or IgG4.

9. The antibody of any one of claims 1-8, wherein the antibody comprises a heavy chain comprising an amino acid sequence selected from SEQ ID NOs: 5 and a light chain comprising an amino acid sequence selected from SEQ ID NOs: SEQ ID NO:3, SEQ ID NO:17, SEQ ID NO: 19, or SEQ ID NO: 29.

10. The antibody of claim 9, wherein the antibody comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 5 and a light chain comprising the amino acid sequence of SEQ ID NO: 3.

11. An isolated antibody that binds to Ly6E, wherein the antibody comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 5 and a light chain comprising the amino acid sequence of SEQ ID NO: 3.

12. An antibody of any one of claims 1-11, wherein the antibody is a multispecific antibody.

13. The antibody of claim 12, wherein the multispecific antibody is a bispecific antibody.

14. The antibody of claim 12 or claim 13, wherein the multispecific antibody binds Ly6E and CD3.

15. An isolated nucleic acid encoding the antibody of any one of claims 1-14.

16. An expression vector comprising the nucleic acid of claim 15.

17. A host cell comprising the nucleic acid of claim 15 or the expression vector of claim 16.

18. A host cell that expresses the antibody of any one of claims 1-14.

19. A method of producing an antibody comprising culturing the host cell of claim 17 or claim 18 so that the antibody is produced.

20. An immunoconjugate comprising the antibody of any one of claims 1-14 and a cytotoxic agent.

21. The immunoconjugate of claim 20 having the formula Ab-(L-D)p, wherein:

(a) Ab is the antibody of any one of claim 1-14;

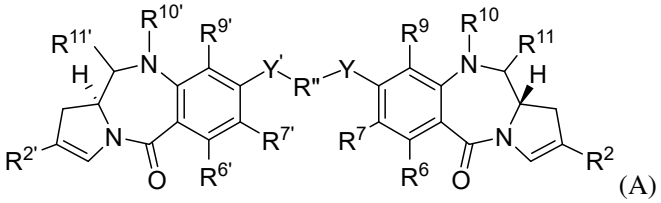
(b) L is a linker;

(c) D is a

pyrrolobenzodiazepine; and

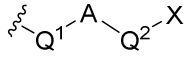
(d) p ranges from 1-8.

22. The immunoconjugate of claim 21, wherein D is a pyrrolobenzodiazepine of Formula A:



(A)

wherein:

R^2 is of formula II: 

(II), wherein A is a C_{5-7} aryl group, X is selected from the group consisting of: OH, SH, CO_2H, COH, N=C=O, NHR^N, and $(OC_2H_4)_mOCH_3$, wherein R^N is selected from the group consisting of H and C_{1-4} alkyl, and wherein m is an integer from 1 to 3, and either:

(i) Q^1 is a single bond, and Q^2 is selected from a single bond and -Z-$(CH_2)_n$-, wherein Z is a single bond, O, S, or NH and n is an integer from 1 to 3; or

(ii) Q^1 is -CH=CH-, and Q^2 is a single bond;

$R^{2'}$ is a C_{5-10} aryl group, optionally substituted by one or more substituents selected from the group consisting of halo, nitro, cyano, ether, C_{1-7} alkyl, C_{3-7} heterocyclyl, and bis-oxy-C_{1-3} alkylene;

R^6 and R^9 are independently selected from H, R, OH, OR, SH, SR, NH_2, NHR, NRR', nitro, Me_3Sn and halo;

R^7 is selected from the group consisting of H, R, OH, OR, SH, SR, NH_2, NHR, NHRR', nitro, Me_3Sn, and halo;

where R and R' are independently selected from optionally substituted C_{1-12} alkyl, C_{3-20} heterocyclyl and C_{5-20} aryl groups;

either:

(a) R^{10} is H, and R^{11} is OH or OR^A, wherein R^A is C_{1-4} alkyl;

(b) R^{10} and R^{11} form a nitrogen-carbon double bond between the nitrogen and carbon atoms to which they are bound; or

(c) R^{10} is H and R^{11} is SO_ZM, wherein z is 2 or 3 and M is a monovalent pharmaceutically acceptable cation;

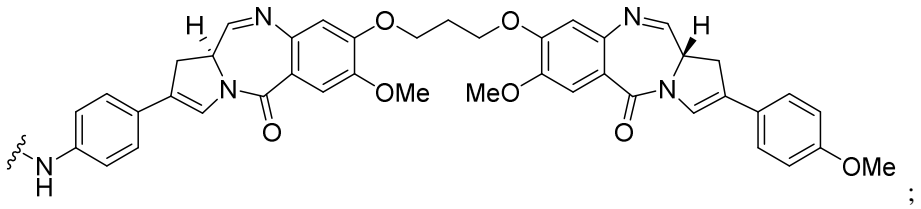
R" is a C_{3-12} alkylene group, which chain may be interrupted by one or more heteroatoms independently selected from the group consisting of O, S, and NH, and/or one or more aromatic rings independently selected from the group consisting of benzene or pyridine;

Y is O, S, or NH;

$R^{6'}$, $R^{7'}$, and $R^{9'}$ are selected from the same groups as R^6, R^7 and R^9 respectively, and $R^{10'}$ and $R^{11'}$ are the same as R^{10} and R^{11} respectively, wherein if R^{11} and $R^{11'}$ are SO_ZM, M may represent a divalent pharmaceutically acceptable cation; and

the point of attachment to the linker L is through R^2 or $R^{2'}$.

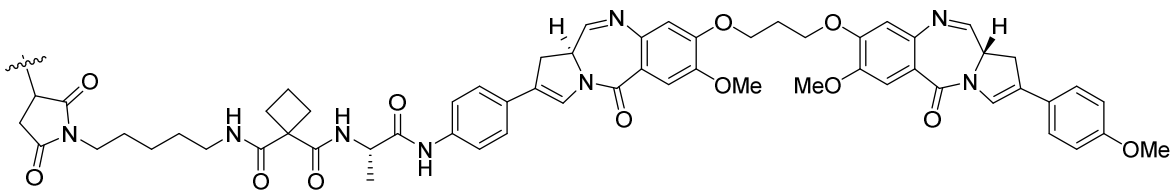
23. The immunoconjugate of claim 22, wherein D has the structure:



;

wherein the sqiggly line indicates the point of attachment to the linker L.

24. The immunoconjugate of any one of claims 21-23, wherein (L-D) has the following structure:



wherein the squiggly line indicates the point of attachment to the protein .

25. The immunoconjugate of any one of claims 21-24, wherein p ranges from 1.5-5 or 1.5-6 or 1.5-4 or 2-3.

26. The immunoconjugate of any one of claims 20-25, comprising the antibody of claim 7.

27. The immunoconjugate of any one of claims 20-26, comprising the antibody of claim 11.

28. A pharmaceutical formulation comprising the immunoconjugate of any one of claims 20-27 and a pharmaceutically acceptable carrier.

29. The pharmaceutical formulation of claim 28, further comprising an additional therapeutic agent.

30. Use of the immunoconjugate of any one of claims 20-27 or the pharmaceutical formulation of claim 28 or claim 29, in the manufacture of a medicament for treating an individual having an Ly6E-positive cancer.

31. The use of claim 30, wherein the Ly6E-positive cancer is selected from a breast cancer, pancreatic cancer, colon cancer, colorectal cancer, melanoma, ovarian cancer, non-small cell lung cancer, or gastric cancer.

32. The use of claim 30 or claim 31, wherein the medicament is to be administered with an additional therapeutic agent.

33. The use of claim 32, wherein the additional therapeutic agent is a platinum complex.

34. An *in vitro* method of inhibiting proliferation of an Ly6E-positive cell, the method comprising exposing the cell to the immunoconjugate of any one of claims 20-27 under conditions permissive for binding of the immunoconjugate to Ly6E on the surface of the cell, thereby inhibiting proliferation of the cell.

35. The method of claim 34, wherein the cell is a breast, pancreatic, colon, colorectal, melanoma, ovarian non-small cell lung or gastric cancer cell.

36. The antibody of any one of claims 1-14 conjugated to a label.

37. The antibody of claim 36, wherein the label is a positron emitter.

38. The antibody of claim 37, wherein the positron emitter is ^{89}Zr.

39. A method of detecting human Ly6E in a biological sample comprising contacting the biological sample with the anti-Ly6E antibody of any one of claims 1-14 under conditions permissive for binding of the anti-Ly6E antibody to a naturally occurring human Ly6E, and detecting whether a complex is formed between the anti-Ly6E antibody and a naturally occurring human Ly6E in the biological sample.

40. The method of claim 39, wherein the anti-Ly6E antibody is an antibody as in claim 7 or claim 11.

41. The method of claim 39 or claim 40, wherein the biological sample is a breast cancer sample, a pancreatic cancer sample, a colon cancer sample, a colorectal cancer sample, melanoma cancer sample, ovarian cancer sample, a non-small cell lung cancer sample, or a gastric cancer sample.