WHAT IS CLAIMED IS:

1. A humanized antibody or antigen binding fragment thereof that specifically binds a human folate receptor 1, wherein the antibody comprises:

(a) a heavy chain CDR1 comprising GYFMN (SEQ ID NO:1); a heavy chain CDR2 comprising RIHPYDGDTFYNQKFQG (SEQ ID NO:2); and a heavy chain CDR3 comprising YDGSRAMDY (SEQ ID NO:3); and

(b) a light chain CDR1 comprising KASQSVSFAGTSLMH (SEQ ID NO:7); a light chain CDR2 comprising RASNLEA (SEQ ID NO:8); and a light chain CDR3 comprising QQSREYPYT (SEQ ID NO:9).

2. The humanized antibody or antigen binding fragment of claim 1, wherein said antibody or antigen binding fragment comprises a heavy chain variable domain of SEQ ID NO:4 and a light chain variable domain of SEQ ID NO:10 or SEQ ID NO:11.

3. The humanized antibody or antigen binding fragment of claim 1, wherein said antibody comprises a heavy chain of SEQ ID NO:6 and a light chain of SEQ ID NO:12 or SEQ ID NO:13.

4. The humanized antibody or antigen binding fragment thereof of claim 1, wherein said antibody comprises a heavy chain encoded by the plasmid DNA deposited with the ATCC on April 7, 2010 and having ATCC deposit no. PTA-10772 and a light chain encoded by the plasmid DNA deposited with the ATCC on April 7, 2010 and having ATCC deposit no. PTA-10773 or PTA-10774.

5. The humanized antibody or antigen binding fragment thereof of claim 1, wherein said antibody or antigen binding fragment comprises a heavy chain variable domain at least about 90%, about 95%, or about 99% identical to SEQ ID NO:4, and a light chain variable domain at least about 90%, about 95%, or about 99% identical to SEQ ID NO:10 or SEQ ID NO:11.

6. The humanized antibody or antigen binding fragment thereof of any one of claims 1-5 which is a full length antibody.

7. The humanized antibody or antigen binding fragment thereof of any one of claims 1, 2, and 5 which is an antigen binding fragment.

8. The humanized antibody or antigen binding fragment thereof of claim 7, wherein said antigen binding fragment comprises a Fab, a Fab', a F(ab')2, a Fd, a single chain Fv or scFv, a disulfide linked Fv, a vNAR domain, a IgNar, an intrabody, an IgG-CH2, a minibody, a F(ab')3, a tetrabody, a triabody, a diabody, a single-domain antibody, DVD-Ig, Fcab, mAb2, a (scFv)2, or a scFv-Fc.

9. The humanized antibody or antigen binding fragment thereof of any one of claims 1-8, which binds to a human folate receptor 1 with a Kd of about 1.0 nM or better.

10. The humanized antibody or antigen binding fragment thereof of any one of claims 1-8, which binds to a human folate receptor 1 with a Kd of about 1.0 to about 10 nM.

11. A method of making the humanized antibody of any one of claims 1-6 comprising (a) culturing a cell expressing said humanized antibody; and (b) isolating the humanized antibody from said cultured cell.

12. An immunoconjugate having the formula (A) - (L) - (C), wherein:

(A) is a humanized antibody or antigen binding fragment thereof of any one of claims 1-10;

(L) is a linker; and

(C) is a cytotoxic agent; and

wherein said linker (L) links (A) to (C).

13. The immunoconjugate of claim 12, wherein said linker is selected from the group consisting of a cleavable linker, a non-cleavable linker, a hydrophilic linker, and a dicarboxylic acid based linker.

14. The immunoconjugate of claim 13, wherein said linker is selected from the group consisting of: *N*-succinimidyl 4-(2-pyridyldithio)pentanoate (SPP); *N*-succinimidyl 4-(2-pyridyldithio)-2-sulfopentanoate (sulfo-SPP); *N*-succinimidyl 4-(2-pyridyldithio)butanoate

(SPDB); *N*-succinimidyl 4-(2-pyridyldithio)-2-sulfobutanoate (sulfo-SPDB); *N*-succinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (SMCC); *N*-sulfosuccinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (sulfoSMCC); *N*-succinimidyl-4-(iodoacetyl)-aminobenzoate (SIAB); and *N*-succinimidyl-[(N-maleimidopropionamido)-tetraethyleneglycol] ester (NHS-PEG4-maleimide).

15. The immunoconjugate of claim 14, wherein said linker is *N*-succinimidyl 4-(2-pyridyldithio)butanoate (SPDB) or *N*-succinimidyl 4-(2-pyridyldithio)-2-sulfobutanoate (sulfo-SPDB).

16. The immunoconjugate of any one of claims 12-15, wherein said cytotoxic agent is selected from the group consisting of a maytansinoid, maytansinoid analog, benzodiazepine, taxoid, CC-1065, CC-1065 analog, duocarmycin, duocarmycin analog, calicheamicin, dolastatin, dolastatin analog, auristatin, tomaymycin derivative, and leptomycin derivative or a prodrug of the agent.

17. The immunoconjugate of claim 16, wherein said cytotoxic agent is a maytansinoid.

18. The immunoconjugate of claim 17, wherein said cytotoxic agent is N(2')-deacetyl-N(2')-(3-mercapto-1-oxopropyl)-maytansine or N(2')-deacetyl-N(2')-(4-mercapto-4-methyl-1-oxopentyl)-maytansine.

19. The immunoconjugate of any one of claims 12-18, wherein (A) comprises the heavy chain variable domain of SEQ ID NO:4 and the light chain variable domain of SEQ ID NO:10 or SEQ ID NO:11.

20. The immunoconjugate of claim 12, wherein:

(A) comprises the heavy chain variable domain of SEQ ID NO:4 and the light chain variable domain of SEQ ID NO:10 or SEQ ID NO:11;

(L) comprises *N*-succinimidyl 4-(2-pyridyldithio)butanoate (SPDB); and

(C) comprises N(2')-deacetyl-N(2')-(4-mercapto-4-methyl-1-oxopentyl)-maytansine.

21. The immunoconjugate of claim 12, wherein:

(A) comprises the heavy chain variable domain of SEQ ID NO:4 and the light chain variable domain of SEQ ID NO:10 or SEQ ID NO:11;

(L) comprises N-succinimidyl 4-(2-pyridyldithio)-2-sulfobutanoate (sulfo-SPDB); and

(C) comprises N(2')-deacetyl-N(2')-(4-mercapto-4-methyl-1-oxopentyl)-maytansine.

22. The immunoconjugate of any one of claims 19-21, wherein (A) comprises the heavy chain variable domain of SEQ ID NO:4 and the light chain variable domain of SEQ ID NO:11.

23. The immunoconjugate of any one of claims 12-22, further comprising 2-6 (C).

24. A pharmaceutical composition comprising the antibody, antigen binding fragment thereof, or immunoconjugate of any one of claims 1-10 and 12-23 and a pharmaceutically acceptable carrier.

25. A pharmaceutical composition comprising the antibody, antigen binding fragment thereof, or immunoconjugate of any one of claims 1-10 and 12-23, further comprising a second anti-cancer agent.

26. The pharmaceutical composition of claim 24 or claim 25, wherein the immunoconjugates have an average of about 3 to about 4 (C) per (A).

27. A diagnostic reagent comprising the antibody or antigen binding fragment of any one of claims 1-10.

28. The diagnostic reagent of claim 27 further comprising a label.

29. The diagnostic reagent of claim 28, wherein said label is selected from the group consisting of a radiolabel, a fluorophore, a chromophore, an imaging agent and a metal ion.

30. A kit comprising the antibody, antigen binding fragment thereof, or immunoconjugate of any one of claims 1-10 and 12-23.

31. Use of the antibody, antigen binding fragment thereof, immunoconjugate, or pharmaceutical composition of any one of claims 1-10 and 12-26 in the preparation of a medicament for inhibiting tumor growth in a subject, wherein the inhibiting tumor growth in a subject comprises administering a therapeutically effective amount of the antibody, antigen binding fragment thereof, immunoconjugate, or pharmaceutical composition of any one of claims 1-10 and 12-26 to the subject.

32. Use of the humanized antibody, antigen binding fragment thereof, immunoconjugate, or pharmaceutical composition of any one of claims 1-10 and 12-26 in the preparation of a medicament for treating cancer in a subject, wherein the treating cancer in a subject comprises administering a therapeutically effective amount of the antibody, antigen binding fragment thereof, immunoconjugate, or pharmaceutical composition of any one of claims 1-10 and 12-26 to the subject.

33. The use of claim 31, wherein the tumor is selected from the group consisting of: ovarian tumor, brain tumor, breast tumor, uterine tumor, endometrial tumor, pancreatic tumor, renal tumor, and lung tumor.

34. The use of claim 33, wherein the tumor is an ovarian tumor.

35. The use of claim 33, wherein the tumor is a lung tumor.

36. The use of claim 33, wherein the tumor is an endometrial tumor.

37. The use of claim 32, wherein the cancer is selected from the group consisting of: ovarian cancer, brain cancer, breast cancer, uterine cancer, endometrial cancer, pancreatic cancer, renal cancer, and lung cancer.

38. The use of claim 37, wherein the cancer is ovarian cancer.

39. The use of claim 37, wherein the cancer is lung cancer.

40. The use of claim 37, wherein the cancer is endometrial cancer.

41. The use of claim 31, wherein the inhibiting tumor growth in a subject further comprises administering a second anti-cancer agent to the subject.

42. The use of claim 41, wherein said second anti-cancer agent is a chemotherapeutic agent.

43. The use of claim 32, wherein the treating cancer in a subject further comprises administering a second anti-cancer agent to the subject.

44. The use of claim 43, wherein said second anti-cancer agent is a chemotherapeutic agent.

45. An isolated cell producing the antibody of any one of claims 1-6.

WHAT IS CLAIMED IS:

1. An invention not claimed in any divisional application.