WHAT IS CLAIMED IS:

1. An antibody that binds to human transthyretin comprising a mature heavy chain variable region comprising three heavy chain CDRs having sequences comprising SEQ ID NOs: 67-69 respectively, and a mature light chain variable region comprising three light chain CDRs having sequences comprising SEQ ID NOS. 77-79, respectively, except that positions H52 and L26 by Kabat numbering are independently each N or S.

2. The antibody of claim 1, wherein the antibody is a monoclonal antibody.

3. The antibody of claim 1, wherein the antibody is a chimeric, humanized, or veneered antibody.

4. The antibody of claim 1, wherein the antibody has a human IgG1 isotype.

5. The antibody of claim 1, wherein the antibody has a human IgG2 or IgG4 isotype.

6. The antibody of claim 1, wherein the antibody is a chimeric antibody.

7. The antibody of claim 1, which is a humanized antibody.

8. The humanized antibody of claim 7 comprising a humanized mature heavy chain variable region having an amino acid sequence at least 90% identical to any one of SEQ ID NOS: 64-66 and a humanized mature light chain variable region having an amino acid sequence at least 90% identical to any one of SEQ ID NOS: 74-76, except that position H82a is N or S, position H83 is R or K, position H84 is A or S, position H89 is V or M, and position L18 is S or P, wherein positions are defined by Kabat numbering.

9. The humanized antibody of claim 8, wherein at least one of the following positions is occupied by the amino acid as specified: position H1 is occupied by E, position H47 is occupied by L, and position L36 is occupied by F, wherein positions are defined by Kabat numbering.

10. The humanized antibody of claim 9, wherein positions H1 and H47 are occupied by E and L, respectively, wherein positions are defined by Kabat numbering.

11. The humanized antibody of claim 9, wherein position L36 is occupied by F, wherein the position is defined by Kabat numbering.

12. The humanized antibody of claim 8, wherein at least one of the following positions is occupied by the amino acid as specified: position H3 is occupied by K, position H105 is occupied by T, position L8 is occupied by A, position L9 is occupied by P, position L19 is occupied by V, position L26 is occupied by S, position L60 is occupied by S, and position L70 is occupied by A wherein positions are defined by Kabat numbering.

13. The humanized antibody of claim 12, wherein positions H3 and H105 are occupied by K and T, respectively, wherein positions are defined by Kabat numbering.

14. The humanized antibody of claim 12, wherein positions L8, L9, L19, and L70 are occupied by A, P, V, and A, respectively, wherein positions are defined by Kabat numbering.

15. The humanized antibody of claim 12, wherein positions L26 and L60 are each occupied by S, wherein positions are defined by Kabat numbering.

16. The humanized antibody of claim 8, comprising a mature heavy chain variable region having an amino acid sequence at least 95% identical to any one of SEQ ID NOS: 64-66 and a mature light chain variable region having an amino acid sequence at least 95% identical to any one of SEQ ID NOS: 74-76, except that position H82a is N or S, position H83 is R or K, position H84 is A or S, position H89 is V or M, and position L18 is S or P, wherein positions are defined by Kabat numbering.

17. The humanized antibody of claim 16, comprising a mature heavy chain variable region having an amino acid sequence at least 98% identical to any one of SEQ ID NOS: 64-66 and a mature light chain variable region having an amino acid sequence at least 98% identical to any one of SEQ ID NOS: 74-76, except that position H82a is N or S,

position H83 is R or K, position H84 is A or S, position H89 is V or M, and position L18 is S or P, wherein positions are defined by Kabat numbering.

18. The humanized antibody of claim 17, wherein the mature heavy chain variable region has the amino acid sequence of any one of SEQ ID NOS: 64-66, and the mature light chain variable region has the amino acid sequence of any one of SEQ ID NOS: 74-76.

19. The humanized antibody of claim 18, wherein the mature heavy chain variable region has the amino acid sequence of SEQ ID NO: 65 and the mature light chain variable region has the amino acid sequence of SEQ ID NO: 76.

20. The antibody of claim 1, wherein the antibody is an intact antibody.

21. The antibody of claim 1, wherein the antibody is a binding fragment.

22. The antibody of claim 21, wherein the binding fragment is a single-chain antibody, Fab, or Fab'2 fragment.

23. The humanized antibody of any one of claims 1, 8 or 19, wherein the mature light chain variable region is fused to a light chain constant region and the mature heavy chain variable region is fused to a heavy chain constant region.

24. The humanized antibody of claim 23, wherein the heavy chain constant region is a mutant form of a natural human heavy chain constant region which has reduced binding to an Fc receptor relative to the natural human heavy chain constant region.

25. The humanized antibody of claim 23, wherein the heavy chain constant region is of an IgG1 isotype.

26. The humanized antibody of claim 23, wherein the mature heavy chain variable region is fused to a heavy chain constant region having the sequence of SEQ ID NO: 103 with or without the C-terminal lysine and/ or the mature light chain variable region is fused to a light chain constant region having the sequence of SEQ ID NO: 104 or 105.

27. A pharmaceutical composition comprising the antibody of claim 1 and a pharmaceutically acceptable carrier.

28. A nucleic acid encoding the heavy chain and light chain of the antibody in claim 1.

29. The nucleic acid of claim 28 having the sequence comprising any one of SEQ ID NOS: 87, 89 and 91-96.

30. A recombinant expression vector comprising the nucleic acid of claim 28.

31. A host cell transformed with the recombinant expression vector of claim 30.

32. A method of humanizing an antibody, the method comprising:

(a) selecting one or more acceptor antibodies;

(b) identifying the amino acid residues of a mouse antibody to be retained;

(c) synthesizing a nucleic acid encoding a humanized heavy chain comprising CDRs of the mouse antibody heavy chain and a nucleic acid encoding a humanized light chain comprising CDRs of the mouse antibody light chain; and

(d) expressing the nucleic acids in a host cell to produce a humanized antibody; wherein the mouse antibody comprises the heavy chain variable region of SEQ ID NO: 61 and the light chain variable region of SEQ ID NO: 70.

33. A method of producing a humanized, chimeric, or veneered antibody, the method comprising:

(a) culturing cells transformed with nucleic acids encoding the heavy and light chains of the antibody, so that the cells secrete the antibody; and

(b) purifying the antibody from cell culture media; wherein the antibody is a humanized, chimeric, or veneered form of the antibody of claim 1.

34. A method of producing a cell line producing a humanized, chimeric, or veneered antibody, the method comprising:

(a) introducing a vector encoding heavy and light chains of an antibody and a selectable marker into cells;

(b) propagating the cells under conditions to select for cells having increased copy number of the vector;

(c) isolating single cells from the selected cells; and

(d) banking cells cloned from a single cell selected based on yield of antibody; wherein the antibody is a humanized, chimeric, or veneered form of the antibody of claim 1.

35. The method of claim 34, further comprising propagating the cells under selective conditions and screening for cell lines naturally expressing and secreting at least 100 mg/L/10^6 cells/24h.

36. The antibody of any one of claims 1 to 26 for use in therapy or as a medicine.

37. Use of the antibody of claim 1 in the manufacture of a medicament for inhibiting or reducing aggregation of transthyretin in a subject having a transthyretin-mediated amyloidosis.

38. Use of the antibody of claim 1 in the manufacture of a medicament for inhibiting or reducing transthyretin fibril formation in a subject having a transthyretin-mediated amyloidosis.

39. Use of the antibody of claim 1 in the manufacture of a medicament for reducing transthyretin deposits in a subject having a transthyretin-mediated amyloidosis.

40. Use of the antibody of claim 1 in the manufacture of a medicament for clearing aggregated transthyretin in a subject having a transthyretin-mediated amyloidosis, wherein when administered to the subject, the medicament clears aggregated transthyretin from the subject relative to a subject having a transthyretin mediated amyloidosis who has not received the antibody.

41. Use of the antibody of claim 1 in the manufacture of a medicament for stabilizing a non-toxic conformation of transthyretin in a subject having a transthyretin-mediated amyloidosis.

42. Use of the antibody of claim 1 in the manufacture of medicament for treating a transthyretin-mediated amyloidosis in a subject.

43. Use of the antibody of claim 1 in the manufacture of a medicament for treating a subject having a disease selected from the group consisting of cardiomyopathy, familial amyloid polyneuropathy, central nervous system selective amyloidosis (CNSA), senile systemic amyloidosis, senile cardiac amyloidosis.

44. An *in vitro* method of diagnosing a transthyretin-mediated amyloidosis in a subject, comprising contacting a biological sample obtained from the subject with an effective amount of the antibody of claim 1.

45. The method of claim 44, further comprising detecting the binding of antibody to transthyretin, wherein the presence of bound antibody indicates the subject has a transthyretin-mediated amyloidosis.

46. The method of claim 44, further comprising comparing binding of the antibody to the biological sample with binding of the antibody to a control sample, whereby increased binding of the antibody to the biological sample relative to the control sample indicates the subject has a transthyretin-mediated amyloidosis.

47. The method of claim 46, wherein the biological sample and the control sample comprise cells of the same tissue origin.

48. The method of claim 44, wherein the biological sample and/or the control sample is blood, serum, plasma, or solid tissue.

49. The method of claim 48, wherein the solid tissue is from the heart, peripheral nervous system, autonomic nervous system, kidneys, eyes, or gastrointestinal tract.

50. The method of claim 37, wherein the transthyretin-mediated amyloidosis is associated with amyloid accumulation in the heart, peripheral nervous system, autonomic nervous system, kidneys, eyes, or gastrointestinal tract of the subject.

51. An *in vitro* method of detecting the presence or absence of transthyretin deposits in a subject, comprising contacting a biological sample obtained from the subject suspected of comprising the amyloid accumulation with an effective amount of the antibody of claim 1.

52. A method of determining a level of transthyretin deposits in a subject, comprising administering the antibody of claim 1 and detecting the presence of bound antibody in the subject.

53. The method of claim 52, wherein the presence of bound antibody is determined by positron emission tomography (PET).

54. The nucleic acid of claim 29, wherein the sequence comprises SEQ ID NOS. 92 and 96 encoding the heavy and light chains respectively.

55. The nucleic acid of claim 54, wherein the sequence further comprises SEQ ID NOS. 106 linked to SEQ ID NO: 92 and SEQ ID NO: 108 linked to SEQ ID NO: 96.

56. The use of claim 37, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

57. The use of claim 56, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

58. The use of claim 56, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

59. The use of claim 38, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

60. The use of claim 59, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

61. The use of claim 59, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

62. The use of claim 39, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

63. The use of claim 62, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

64. The use of claim 62, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

65. The use of claim 40, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

66. The use of claim 65, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

67. The use of claim 65, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

68. The use of claim 42, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

69. The use of claim 68, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

70. The use of claim 68, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

71. The use of claim 43, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

72. The use of claim 71, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

73. The use of claim 72, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

74. The antibody of claim 1, wherein heavy chain CDR-H1 has the sequence of SEQ ID NO:118.

75. The humanized antibody of claim 7, wherein position H1 is occupied by E, position H47 is occupied by L, position L26 is occupied by S, position L36 is occupied by F and position L60 is occupied by S.

76. The humanized antibody of claim 7, wherein the mature heavy chain variable region has the amino acid sequence of any one of SEQ ID NOS: 64-66, and the mature light chain variable region has the amino acid sequence of any one of SEQ ID NOS: 74-76, wherein the R at position L107 is optional.

77. The use of claim 41, wherein the antibody comprises a mature heavy chain variable region having the amino acid sequence of SEQ ID NO: 65 and a mature light variable region having the amino acid sequence of SEQ ID NO: 76.

78. The use of claim 77, wherein the mature heavy chain variable region is fused to a human IgG1 heavy chain constant region, and the mature light chain variable region is fused to a human kappa light chain constant region.

79. The use of claim 77, wherein the antibody comprises a mature heavy chain having the amino acid sequence of SEQ ID NO: 82 with or without the C-terminal lysine and mature light chain having the amino acid sequence of SEQ ID NO: 86.

80. The use of any one of claims 37 to 42, wherein the transthyretin-mediated amyloidosis is selected from the group consisting of senile systemic amyloidosis (SSA), senile cardiac amyloidosis (SCA), familial amyloid polyneuropathy (FAP), familial amyloid cardio myopathy (FAC), and central nervous system selective amyloidosis (CNSA).