CLAIMS

1. An antibody capable of binding to human VEGF and mouse VEGF with Kd values within 10-fold of the other, wherein the antibody binds to an epitope comprising residue G88 of human VEGF, and wherein the antibody contacts between about 50% to about 80% of the surface area of residue G88 of human VEGF.

2. The antibody of claim 1, wherein the epitope further comprises any one or more additional residues selected from the group consisting of residues F17, K48, L66, M81, I83, H86, Q89, and I91 of human VEGF.

3. An antibody capable of binding to human VEGF and mouse VEGF with Kd values within 10-fold of the other, wherein the antibody comprises one or more of the following complementarity determining regions (CDRs) selected from the group consisting of:

(a) a CDR-H1 comprising the amino acid sequence GFAISDYDIH (SEQ ID NO: 505);
(b) a CDR-H2 comprising the amino acid sequence DIAPYAGATAYADSVKG (SEQ ID NO: 506);
(c) a CDR-H3 comprising the amino acid sequence SSYAYYAAMDY (SEQ ID NO: 507);
(d) a CDR-L1 comprising the amino acid sequence RASQSYAYAVA (SEQ ID NO: 493);
(e) a CDR-L2 comprising the amino acid sequence DASYLYS (SEQ ID NO: 494); and
(f) a CDR-L3 comprising the amino acid sequence QQAYSSPDT (SEQ ID NO: 495).

4. The antibody of claim 3, wherein the heavy chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: GFAISDYDIH (SEQ ID NO: 505), DIAPYAGATAYADSVKG (SEQ ID NO: 506), and SSYAYYAAMDY (SEQ ID NO: 507); or

wherein the light chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: RASQSYAYAVA (SEQ ID NO: 493), DASYLYS (SEQ ID NO: 494), and QQAYSSPDT (SEQ ID NO: 495).

5. The antibody of claim 3, wherein the heavy chain of the antibody comprises the sequence MKKNIAFLLASMFVFSIATNAYAEVQLVESGGGLVQPGGSLRLSCAASGFAISDYDIHWVRQAPGKGL EWVADIAPYAGATAYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRSSYAYYAAMDYWG QGTLVTVSS (SEQ ID NO: 935).

6. The antibody of claim 3, wherein the light chain of the antibody comprises the sequence DIQMTQSPSSLSASVGDRVTITCRASQSYAYAVAWYQQKPGKAPKLLIYDASYLYSGVP SRFSGSGSGTDFTLTISSLQPEDFATYYCQQAYSSPDTFGQGTKVEIK (SEQ ID NO: 936).

7. An antibody capable of binding to human VEGF and mouse VEGF with Kd values within 10-fold of the other, wherein the antibody comprises one or more of the following complementarity determining regions (CDRs) selected from the group consisting of:

(a) a CDR-H1 comprising the amino acid sequence DYDIH (SEQ ID NO: 937);
(b) a CDR-H2 comprising the amino acid sequence AIAPYSGSTYYADSVK (SEQ ID NO: 510);
(c) a CDR-H3 comprising the amino acid sequence SYAYYSAMDY (SEQ ID NO: 511);
(d) a CDR-L1 comprising the amino acid sequence CRASQASYYDVA (SEQ ID NO: 938);
(e) a CDR-L2 comprising the amino acid sequence AASYLYS (SEQ ID NO: 498); and
(f) a CDR-L3 comprising the amino acid sequence CQQYYYAPAT (SEQ ID NO: 939).

8. The antibody of claim 7, wherein the heavy chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: DYDIH (SEQ ID NO: 937), AIAPYSGSTYYADSVK (SEQ ID NO: 510), and SYAYYSAMDY (SEQ ID NO: 511); or

wherein the light chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: CRASQASYYDVA (SEQ ID NO: 938), AASYLYS (SEQ ID NO: 498), and CQQYYYAPAT (SEQ ID NO: 939).

9. The antibody of claim 7, wherein the heavy chain of the antibody comprises the sequence MKKNIAFLLASMFVFSIATNAYAEVQLVESGGGLVQPGGSLRLSCAASGFSISDYDIHWVRQAPGKGL EWVAAIAPYSGSTYYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRSSYAYYSAMDYWG QGTLVTVSS (SEQ ID NO: 940).

10. The antibody of claim 7, wherein the light chain of the antibody comprises the sequence DIQMTQSPSSLSASVGDRVTITCRASQASYYDVAWYQQKPGKAPKLLIYAASYLYSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQYYYAPATFGQGTKVEIK (SEQ ID NO: 941).

11. The antibody of any one of claims 1-10, wherein the antibody is selected from the group consisting of a synthetic antibody, a chimeric antibody, a humanized antibody, an affinity matured antibody, and a bispecific antibody.

12. The antibody of any one of claims 1-10, wherein the antibody is an antibody fragment.

13. The antibody of any one of claims 1-10, wherein the antibody binds to mouse and human VEGF with Kd values of no more than about 10 nM.

14. A nucleic acid molecule encoding the antibody of any one of claims 1-13.

15. A vector comprising the nucleic acid molecule of claim 14.

16. A host cell comprising the vector of claim 15.

17. A process of producing an antibody, the process comprising culturing the host cell of claim 16 and recovering the antibody from the host cell medium.

18. Use of an antibody of any one of claims 1-13 in the manufacture of a medicament for treating a disorder associated with pathological angiogenesis in a human or a mouse.

19. The use of claim 18, wherein the human or mouse is suffering from cancer or a disease caused by ocular neovascularization.

20. The use of claim 19, wherein the cancer is selected from the group consisting of breast cancer, colorectal cancer, non-small cell lung cancer, non-Hodgkin's lymphoma (NHL), renal cancer, prostate cancer, liver cancer, head and neck cancer, melanoma, ovarian cancer, mesothelioma, and glioblastoma.

21. The use of claim 19, wherein the disease caused by ocular neovascularization is diabetic blindness, retinopathy, primary diabetic retinopathy or age-induced macular degeneration.

22. Use of an antibody of any one of claims 1-13 in the manufacture of a medicament for alleviating cancer or a disease caused by ocular neovascularization in a human or a mouse.

23. The use of claim 22, wherein the cancer is selected from the group consisting of breast cancer, colorectal cancer, non-small cell lung cancer, non-Hodgkin's lymphoma (NHL), renal cancer, prostate cancer, liver cancer, head and neck cancer, melanoma, ovarian cancer, mesothelioma, and glioblastoma.

24. The use of claim 22, wherein the disease caused by ocular neovascularization is diabetic blindness, retinopathy, primary diabetic retinopathy or age-induced macular degeneration.

CLAIMS

1. An antibody capable of binding to human VEGF and mouse VEGF with Kd values within 10-fold of the other, wherein the antibody binds to an epitope comprising residue G88 of human VEGF.

2. The antibody of claim 1, wherein the epitope further comprises any one or more additional residues selected from the group consisting of residues F17, K48, L66, M81, I83, H86, Q89, and I91 of human VEGF.

3. The antibody of claim 1, wherein the antibody contacts between about 50% to about 80% of the surface area of residue G88 of human VEGF.

4. An antibody capable of binding to human VEGF and mouse VEGF with Kd values within 10-fold of the other, wherein the antibody comprises one or more of the following complementarity determining regions (CDRs) selected from the group consisting of:

(a) a CDR-H1 comprising the amino acid sequence GFAISDYDIH (SEQ ID NO: 505);

(b) a CDR-H2 comprising the amino acid sequence DIAPYAGATAYADSVKG (SEQ ID NO: 506);

(c) a CDR-H3 comprising the amino acid sequence SSYAYYAAMDY (SEQ ID NO: 507);

(d) a CDR-L1 comprising the amino acid sequence RASQSYAYAVA (SEQ ID NO: 493);

(e) a CDR-L2 comprising the amino acid sequence DASYLYS (SEQ ID NO: 494); and

(f) a CDR-L3 comprising the amino acid sequence QQAYSSPDT (SEQ ID NO: 495).

5. The antibody of claim 4, wherein the heavy chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: GFAISDYDIH (SEQ ID NO: 505), DIAPYAGATAYADSVKG (SEQ ID NO: 506), and SSYAYYAAMDY (SEQ ID NO: 507); or

wherein the light chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: RASQSYAYAVA (SEQ ID NO: 493), DASYLYS (SEQ ID NO: 494), and QQAYSSPDT (SEQ ID NO: 495).

6. The antibody of claim 4, wherein the heavy chain of the antibody comprises the sequence MKKNIAFLLASMFVFSIATNAYAEVQLVESGGGLVQPGGSLRLSCAASGFAISDYDIHWVR QAPGKGLEWVADIAPYAGATAYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSR SSYAYYAAMDYWGQGTLVTVSS (SEQ ID NO: 935).

7. The antibody of claim 4, wherein the light chain of the antibody comprises the sequence DIQMTQSPSSLSASVGDRVTITCRASQSYAYAVAWYQQKPGKAPKLLIYDASYLYSGVP SRFSGSGSGTDFTLTISSLQPEDFATYYCQQAYSSPDTFGQGTKVEIK (SEQ ID NO: 936).

8. An antibody capable of binding to human VEGF and mouse VEGF with Kd values within 10-fold of the other, wherein the antibody comprises one or more of the following complementarity determining regions (CDRs) selected from the group consisting of:

(a) a CDR-H1 comprising the amino acid sequence DYDIH (SEQ ID NO: 937);

(b) a CDR-H2 comprising the amino acid sequence AIAPYSGSTYYADSVK (SEQ ID NO: 510);

(c) a CDR-H3 comprising the amino acid sequence SYAYYSAMDY (SEQ ID NO: 511);

(d) a CDR-L1 comprising the amino acid sequence CRASQASYYDVA (SEQ ID NO: 938);

(e) a CDR-L2 comprising the amino acid sequence AASYLYS (SEQ ID NO: 498); and

(f) a CDR-L3 comprising the amino acid sequence CQQYYYAPAT (SEQ ID NO: 939).

9. The antibody of claim 8, wherein the heavy chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: DYDIH (SEQ ID NO: 937), AIAPYSGSTYYADSVK (SEQ ID NO: 510), and SYAYYSAMDY (SEQ ID NO: 511); or

wherein the light chain of the antibody comprises at least one, at least two, or all three of the CDR sequences selected from: CRASQASYYDVA (SEQ ID NO: 938), AASYLYS (SEQ ID NO: 498), and CQQYYYAPAT (SEQ ID NO: 939).

10. The antibody of claim 8, wherein the heavy chain of the antibody comprises the sequence MKKNIAFLLASMFVFSIATNAYAEVQLVESGGGLVQPGGSLRLSCAASGFSISDYDIHWVR QAPGKGLEWVAAIAPYSGSTYYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSR SSYAYYSAMDYWGQGTLVTVSS (SEQ ID NO: 940).

11. The antibody of claim 8, wherein the light chain of the antibody comprises the sequence DIQMTQSPSSLSASVGDRVTITCRASQASYYDVAWYQQKPGKAPKLLIYAASYLYSGVPSR FSGSGSGTDFTLTISSLQPEDFATYYCQQYYYAPATFGQGTKVEIK (SEQ ID NO: 941).

12. The antibody of any one of claims 1-11, wherein the antibody is selected from the group consisting of a synthetic antibody, a chimeric antibody, a humanized antibody, an affinity matured antibody, and a bispecific antibody.

13. The antibody of any one of claims 1-11, wherein the antibody is an antibody fragment.

14. The antibody of any one of claims 1-11, wherein the antibody binds to mouse and human VEGF with Kd values of no more than about 10 nM.

15. A nucleic acid molecule encoding the antibody of any one of claims 1-14.

16. A vector comprising the nucleic acid molecule of claim 15.

17. A host cell comprising the vector of claim 16.

18. A process of producing an antibody, the process comprising culturing the host cell of claim 17 and recovering the antibody from the host cell medium.

19. Use of an antibody of any one of claims 1-14 in the manufacture of a medicament for inhibiting angiogenesis in a human or a mouse.

20. The use of claim 19, wherein the human or mouse is suffering from cancer or a disease caused by ocular neovascularization.

21. The use of claim 20, wherein the cancer is selected from the group consisting of breast cancer, colorectal cancer, non-small cell lung cancer, non-Hodgkin's lymphoma (NHL), renal cancer, prostate cancer, liver cancer, head and neck cancer, melanoma, ovarian cancer, mesothelioma, and glioblastoma.

22. The use of claim 20, wherein the disease caused by ocular neovascularization is diabetic blindness, retinopathy, primary diabetic retinopathy or age-induced macular degeneration.

23. Use of an antibody of any one of claims 1-14 in the manufacture of a medicament for alleviating cancer or a disease caused by ocular neovascularization in a human or a mouse.

24. The use of claim 23, wherein the cancer is selected from the group consisting of breast cancer, colorectal cancer, non-small cell lung cancer, non-Hodgkin's lymphoma (NHL), renal cancer, prostate cancer, liver cancer, head and neck cancer, melanoma, ovarian cancer, mesothelioma, and glioblastoma.

25. The use of claim 23, wherein the disease caused by ocular neovascularization is diabetic blindness, retinopathy, primary diabetic retinopathy or age-induced macular degeneration.