CLAIMS

What is claimed is:

1. An isolated antibody or antigen-binding fragment thereof that specifically binds to an epitope within amino acids 303 through 547 of the sequence set forth in SEQ ID NO:1.

2. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the epitope comprises amino acids within a sequence selected from the group consisting of SEQ ID NOs:2, 3, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, and 34.

3. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the epitope comprises amino acids within the sequence selected from the group consisting of SEQ ID NOs: 2, 3, 21, 22, 23, 24, 27, 28, and 29.

4. The isolated antibody or antigen-binding fragment thereof of any of claims 1-3, wherein the antibody or fragment inhibits enzymatic activity of a LOXL2 polypeptide.

5. The isolated antibody or antigen-binding fragment thereof of any of claims 1-3, wherein the antibody or fragment does not inhibit enzymatic activity of a LOXL2 polypeptide.

6. The isolated antibody or antigen-binding fragment thereof of any of claims 1-5, wherein the antibody or fragment binds to the epitope with an affinity of from about 10^{7} M^{-1} to about 10^{12} M^{-1}.

7. The isolated antibody or antigen-binding fragment thereof of any of claims 1-6, wherein the antibody or fragment comprises a heavy chain, and wherein the heavy chain of the antibody is of the isotype IgG1, IgG2, IgG3, or IgG4.

8. The isolated antibody or antigen-binding fragment thereof of any of claims 1-7, wherein the antibody or fragment is a Fv, scFv, Fab, F(ab')2, or Fab'.

9. The isolated antibody or antigen-binding fragment thereof of any of claims 1-8, wherein the antibody or fragment is humanized.

10. The isolated antibody or antigen-binding fragment thereof of any of claims 1-9, wherein the antibody or fragment is chimeric.

11. The isolated antibody or antigen-binding fragment thereof of any of claims 1-10, wherein the antibody or fragment comprises a covalently linked moiety selected from the group consisting of a non-peptide synthetic polymer, a lipid, a fatty acid, a polysaccharide, a carbohydrate, and a contrast agent.

12. The isolated antibody or antigen-binding fragment thereof of any of claims 1-11, wherein the antibody or fragment is covalently or non-covalently linked to a cancer chemotherapeutic agent.

13. The isolated antibody or antigen-binding fragment thereof of any of claims 1-12, wherein the antibody or fragment is detectably labeled.

14. The isolated antibody or antigen-binding fragment thereof of any of claims 1-13, wherein the epitope comprises amino acids within the sequence set forth in SEQ ID NO:2.

15. The isolated antibody or antigen-binding fragment thereof of any of claims 1-13, wherein the epitope comprises amino acids within the sequence set forth in SEQ ID NO:3.

16. A composition, comprising:

an isolated LOXL2 binding agent, wherein the binding agent is the antibody or fragment of any of claims 1-15; and

a pharmaceutically acceptable carrier or excipient.

17. The composition of claim 16, wherein said binding agent is present in an amount effective to treat a condition associated with LOXL2, which condition is a tumor, a metastasis, angiogenesis, or fibrosis.

18. The composition of claim 16 or 17, wherein the LOXL2 binding agent is linked to a detectable label, a therapeutic agent, or both.

19. A method, comprising:

assessing a level of LOXL2 in a sample obtained from a subject by contacting said sample with the isolated antibody or fragment of any of claims 1-15,

wherein a difference in the level of LOXL2 in the sample in comparison with a reference sample indicates the presence of a condition associated with LOXL2 in the subject.

20. The method of claim 19, wherein said condition associated with LOXL2 is a tumor, a metastasis, angiogenesis, or fibrosis.

21. The method of claim 20, wherein an increase in the LOXL2 levels in the sample from the subject in comparison with a reference sample indicates the presence of a tumor or metastasis thereof, or an increase in tumor or metastatic growth.

22. The method of any of claims 19-21, wherein the reference sample is a sample taken from the subject at an earlier time point compared with the sample from the subject or from unaffected tissue of the same type as that of the sample from the subject, or is a sample from another individual.

23. The method of any of claims 19-22, wherein the antibody is detectably labeled.

24. An *in vitro* method of inhibiting LOXL2 activity, the method comprising: contacting a sample or a cellular tissue with the isolated antibody or fragment of any of claims 1-15, wherein the contacting is carried out *in vitro* or *ex vivo*.

25. An antibody or fragment thereof of any one of claims 1-15, for use in inhibiting LOXL2 activity, wherein a sample or a cellular tissue is to be contacted with the isolated antibody or fragment.

26. Use of an antibody or fragment thereof of any one of claims 1-15 in the manufacture of a medicament for inhibiting LOXL2 activity, wherein a sample or a cellular tissue is to be contacted with the isolated antibody or fragment.

27. The antibody or fragment of claim 25 or the use of claim 26, wherein the contacting reduces a condition in a subject selected from the group consisting of tumor growth, angiogenesis, and fibrosis.

28. An antibody or fragment thereof according to any one of claims 1-15 for use in reducing growth of a tumor in a subject.

29. Use of antibody or fragment thereof according to any one of claims 1-15 in the manufacture of a medicament for reducing growth of a tumor in a subject.

30. The antibody or fragment of claim 28 or the use of claim 29, wherein said tumor is a primary tumor or a metastatic tumor.

31. The antibody or fragment of claim 28 or 30 or the use of claim 29 or 30, wherein said tumor is a solid tumor.

32. An antibody or fragment thereof of any of claims 1-15 for use in inhibiting angiogenesis in a subject.

33. Use of antibody or fragment thereof of any of claims 1-15 in the manufacture of a medicament for inhibiting angiogenesis in a subject.

34. An antibody or fragment thereof of any one of claims 1-15 for use in inhibiting a fibrotic disease in a subject.

35. Use of an antibody or fragment thereof of any of claims 1-15 in the manufacture of a medicament for inhibiting a fibrotic disease in a subject.

36. An antibody or fragment thereof of any one of claims 1-15 for use in monitoring a subject's response to an anti-LOXL2 therapy, wherein the use comprises detecting LOXL2 levels and/or activity in the subject using the antibody or fragment.

37. An antibody or fragment thereof of any one of claims 1-15 for use in therapy.

CLAIMS

What is claimed is:

1. An isolated antibody to lysyl oxidase-like-2 (LOXL2) or an antigen-binding fragment thereof that specifically binds to an epitope within amino acids 325 through 434 of the sequence set forth in SEQ ID NO: 1.

2. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the epitope comprises amino acids within the sequence TPAMGLQKK (SEQ ID NO: 2).

3. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof inhibits enzymatic activity of a LOXL2 polypeptide.

4. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof binds the epitope with an affinity of from about 10^{7} M^{-1} to about 10^{12} M^{-1}.

5. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof comprises a heavy chain, and wherein the heavy chain of the antibody is of the isotype IgG1, IgG2, IgG3, or IgG4.

6. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof is detectably labeled.

7. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof is a Fv, scFv, Fab,

F(ab')2, or Fab'.

8. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof is humanized.

9. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof is chimeric.

10. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the antibody or fragment is covalently or non-covalently linked to a detectable label, a therapeutic agent, a non-peptide synthetic polymer, a lipid, a fatty acid, a polysaccharide, a carbohydrate, or a contrast agent.

11. The isolated antibody or antigen-binding fragment thereof of claim 10, wherein the synthetic polymer is poly(ethylene glycol) polymer.

12. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof is immobilized on a solid support.

13. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the isolated antibody or antigen binding fragment thereof comprises a cancer chemotherapeutic agent covalently or non-covalently linked to the antibody.

14. A composition, comprising:

an isolated antibody or antigen binding fragment thereof according to any one of claims 1 to 13; and

a pharmaceutically acceptable carrier or excipient.

15. The composition of claim 14, wherein said isolated antibody or antigen binding fragment thereof is present in an amount effective to treat a

condition associated with LOXL2, which condition is a tumor, a metastasis, angiogenesis, or fibrosis.

16. A kit for treating a condition associated with LOXL2 comprising a composition comprising an isolated antibody or antigen binding fragment thereof of claim 1 and a pharmaceutically acceptable carrier or excipient.

17. The kit of claim 16, wherein said condition associated with LOXL2 is a tumor, a metastasis, angiogenesis, or fibrosis.

18. The kit of claim 16, wherein the isolated antibody or antigen binding fragment thereof comprises a detectable label, a therapeutic agent or both.

19. An *in vitro* method, comprising:

assessing a level of LOXL2 in a sample from a subject by contacting said sample with the isolated antibody or antigen binding fragment thereof of claim 1,

wherein a difference in the level of LOXL2 in the sample in comparison with a reference sample indicates the presence of a condition associated with LOXL2 in the subject.

20. The method of claim 19, wherein said condition associated with LOXL2 is a tumor, a metastasis, angiogenesis, or fibrosis.

21. An *in vitro* method of inhibiting LOXL2 activity, the method comprising: contacting a sample or a cellular tissue with the isolated antibody or antigen binding fragment thereof of claim 1, wherein the contacting is carried out *in vitro* or *ex vivo*.

22. Use of antibody or fragment thereof according to any one of claims 1-13 in the manufacture of a medicament for reducing growth of a tumor in a subject.

23. Use of antibody or fragment thereof of any one of claims 1-13 in the manufacture of a medicament for inhibiting angiogenesis in a subject.

24. Use of an antibody or fragment thereof of any of claims 1-13 in the manufacture of a medicament for inhibiting a fibrotic disease in a subject.

25. An antibody or fragment thereof of any one of claims 1-13 for use in therapy.