which participate in the formation of five disulfide bonds. The catalytic domain also includes a fibronectin binding domain. Finally, an amino acid sequence similar to a growth factor and cytokine receptor domain, containing four cysteine residues, is present in the catalytic domain.

SUMMARY

[0004] The present disclosure provides antibodies that specifically bind a LOXL2 polypeptide; and further provides compositions comprising same. The antibodies can be used in various treatment and diagnostic methods, which are also provided.

[0004a] In one aspect, there is provided 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.

[0004b] In another aspect, there is provided a composition, comprising: an isolated antibody or antigen binding fragment thereof according to the present invention; and a pharmaceutically acceptable carrier or excipient.

[0004c] In another aspect, there is provided a kit for treating a condition associated with LOXL2 comprising a composition comprising an isolated antibody or antigen binding fragment thereof of the present invention and a pharmaceutically acceptable carrier or excipient.

[0004d] In another aspect, there is provided 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 the present invention, 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.

[0004e] In another aspect, there is provided 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 the present invention, wherein the contacting is carried out *in vitro* or *ex vitro*.

[0004f] In another aspect, there is provided the use of antibody or fragment thereof according to the present invention in the manufacture of a medicament for reducing growth of a tumor in a subject.

[0004g] In another aspect, there is provided the use of antibody or fragment thereof of the present invention in the manufacture of a medicament for inhibiting angiogenesis in a subject.

[0004h] In another aspect, there is provided the use of an antibody or fragment thereof of the present invention in the manufacture of a medicament for inhibiting a fibrotic disease in a subject.

[0004i] In another aspect, there is provided an antibody or fragment thereof of the present invention for use in therapy.

[0005] Accordingly, the present disclosure comprises, *inter alia*, the following ~~embodiment~~examples.

[0006] 1. An isolated antibody to lysyl oxidase-like-2 (LOXL2) that specifically binds to an epitope defined by amino acids 325 through 434 of the sequence depicted in Figure 1 and set forth in SEQ ID NO:1.

[0007] 2. The isolated antibody of ~~embodiment~~example 1, wherein the epitope comprises amino acids within the sequence TPAMGLQKK (SEQ ID NO:2).

[0008] 3. The isolated antibody of ~~embodiment~~example 1, wherein the antibody inhibits enzymatic activity of a LOXL2 polypeptide.

[0009] 4. The isolated antibody of ~~embodiment~~example 1, wherein the antibody does not inhibit enzymatic activity of a LOXL2 polypeptide.

[0010] 5. The isolated antibody of ~~embodiment~~example 1, wherein the antibody binds the epitope with an affinity of from about 10^7 M^{-1} to about 10^{12} M^{-1}.

[0011] 6. The isolated antibody of ~~embodiment~~example 1, wherein the antibody comprises a heavy chain, and wherein the heavy chain of the antibody is of the isotype IgG1, IgG2, IgG3, or IgG4.

[0012] 7. The isolated antibody of ~~embodiment~~example 1, wherein the binding agent is detectably labeled.

[0013] 8. The isolated antibody of ~~embodiment~~example 1, wherein the antibody is a Fv, scFv, Fab, F(ab')2, or Fab'.

[0014] 9. The isolated antibody of ~~embodiment~~example 1, wherein the antibody is humanized.

[0015] 10. The isolated antibody of ~~embodiment~~example 1, wherein the antibody is chimeric.

[0016] 11. The isolated antibody of ~~embodiment~~example 1, wherein wherein the antibody 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, or a contrast agent.

[0017] 12. The isolated antibody of ~~embodiment~~example 11, wherein the synthetic polymer is poly(ethylene glycol) polymer.

[0018] 13. The isolated antibody of ~~embodiment~~example 1, wherein the antibody is immobilized on a solid support.

[0019] 14. The isolated antibody of ~~embodiment~~example 1, wherein the antibody comprises a cancer chemotherapeutic agent covalently or non-covalently linked to the antibody.

[0020] 15. A kit for treating a condition associated with LOXL2 comprising

[0021] a composition comprising an isolated LOXL2 binding agent of ~~embodiment~~example 1 and

[0022] a pharmaceutically acceptable carrier or excipient.

[0023] 16. The kit of ~~embodiment~~example 15, wherein said condition associated with LOXL2 is a tumor, a metastasis, angiogenesis, or fibrosis.

[0024] 17. The kit of ~~embodiment~~example 15, wherein the LOXL2 binding agent comprises a detectable label, a therapeutic agent or both.

[0025] 18. A method of diagnosing a condition associated with LOXL2 comprising:

[0026] assessing a level of LOXL2 in a sample of a subject by contacting said sample with an isolated antibody according to ~~embodiment~~example 1,

[0027] wherein a change in level of LOXL2 in the sample in comparison with a reference sample indicates the presence of the condition associated with LOXL2.

[0028] 19. The method of ~~embodiment~~example 18, wherein said condition associated with LOXL2 is a tumor, a metastasis, angiogenesis, or fibrosis.

[0029] 20. The method of ~~embodiment~~example 19, wherein an increase in LOXL2 levels in the sample in comparison with a reference sample indicates the presence of a tumor or metastasis thereof, or an increase in tumor or metastatic growth.

[0030] 21. The method of ~~embodiment~~example 20, wherein the reference sample is a sample taken from the subject at an earlier time point or from unaffected tissue of the same type, or is a sample from another individual.

[0031] 22. The method of ~~embodiment~~example 18, wherein the antibody is detectably labeled.

[0032] 23. A method of inhibiting LOXL2 activity by contacting a sample or a cellular tissue with an isolated antibody according to ~~embodiment~~example 1.

[0033] 24. The method of ~~embodiment~~example 23, wherein contacting occurs *in vitro* or *ex vivo*.

[0034] 25. The method of ~~embodiment~~example 23, wherein contacting occurs *in vivo*.

[0035] 26. The method of ~~embodiment~~example 23, wherein inhibiting LOXL2 reduces a condition in a subject selected from the group consisting of tumor growth, angiogenesis, and fibrosis.

[0036] 27. A method of reducing growth of a tumor in a subject, comprising administering the antibody of ~~embodiment~~example 1 to the subject.

[0037] 28. The method of ~~embodiment~~example 27, wherein said tumor is a primary tumor or a metastatic tumor.

[0038] 29. The method of ~~embodiment~~example 27, wherein said tumor is a solid tumor.

[0039] 30. A method of inhibiting angiogenesis in a subject comprising administering the antibody of ~~embodiment~~example 1 to the subject.

[0040] 31. A method of inhibiting a fibrotic disease in a subject by administering the antibody of ~~embodiment~~example 1 to the subject.

[0041] 32. A method of monitoring a subject's response to an anti-LOXL2 therapy by detecting LOXL2 levels and/or activity using an antibody according to ~~embodiment~~example 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0042] **Figure 1** shows the amino acid sequence of the human LOXL2 protein (SEQ ID NO:1). The signal peptide sequence (amino acids 1-25), the four scavenger receptor cysteine-rich (SRCR) domains, and the catalytic domain are indicated. SRCR1 extends from amino acids 58-159 inclusive; SRCR2 extends from amino acids 188-302 inclusive, SRCR3 extends from amino acids 325-425 inclusive, SRCR4 extends from amino acids 435-544 inclusive and the catalytic domain extends from amino acids 548-774 inclusive.

[0043] **Figure 2, Panel A** shows a schematic drawing of the human LOXL2 protein, with the SRCR1, SRCR2, SRCR3 and SRCR4 domains indicated. Also indicated are the catalytic domain (labeled "LOX-like domain"), and the locations of a *myc* epitope tag and a His6 purification tag (labeled "6X his") that are present in certain synthetic LOXL2 constructs. Below the schematic, the portions of the sequence represented by a collection of domain