WHAT IS CLAIMED IS:

1. An isolated antibody that binds to LRP6, wherein the antibody inhibits signaling induced by a first Wnt isoform and potentiates signaling induced by a second Wnt isoform.

2. The antibody of claim 1, wherein the first Wnt isoform is selected from the group consisting of Wnt3 and Wnt3a.

3. The antibody of claim 1, wherein the second Wnt isoform is selected from the group consisting of Wnt 1, 2, 2b, 4, 6, 7a, 7b, 8a, 9a, 9b, 10a, and 10b.

4. The antibody of claim 1, wherein the first Wnt isoform is selected from the group consisting of Wnt3 and Wnt3a and the second Wnt isoform is selected from the group consisting of Wnt 1, 2, 2b, 4, 6, 7a, 7b, 8a, 9a, 9b, 10a, and 10b.

5. The antibody of claim 1, wherein the first Wnt isoform is selected from the group consisting of Wnts 1, 2, 2b, 6, 8a, 9a, 9b, and 10b.

6. The antibody of claim 1, wherein the second Wnt isoform is selected from the group consisting of Wnt3 and Wnt3a.

7. The antibody of claim 1, wherein the first Wnt isoform is selected from the group consisting of Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b and the second Wnt isoform is selected from the group consisting of Wnt3 and Wnt3a.

8. The antibody of any one of claims 1-4, wherein antibody binds to the E3-E4 region of LRP6.

9. The antibody of any one of claims 1 or 5-7, wherein antibody binds to the E1-E2 region of LRP6.

10. An isolated antibody that binds to two different regions of LRP6.

11. The antibody of claim 10, wherein the antibody binds to the E1-E2 region of LRP6 and to the E3-E4 region of LRP6.

12. The antibody of claim 10 or 11, wherein the antibody inhibits Wnt signaling induced by the combination of Wnt1 and Wnt3a.

13. The antibody of claim 10, 11, or 12 wherein the antibody inhibits autocrine Wnt signaling.

14. An antibody that competes for binding to LRP6 with the antibody of any one of claims 1-13.

15. An immunoconjugate comprising the antibody of any one of claims 1-13 and a cytotoxic agent.

16. A pharmaceutical formulation comprising the antibody of any one of claims 1-15 and a pharmaceutically acceptable carrier.

17. The antibody of any one of claims 1-14 for use as a medicament.

18. The antibody of any one of claims 1-14 for use in treating cancer or a skeletal disorder.

19. The antibody of any one of claims 1-14 for use in inhibiting signaling induced by a first Wnt isoform and potentiating signaling induced by a second Wnt isoform.

20. Use of the antibody of any one of claims 1-14 in the manufacture of a medicament.

21. The use of claim 20, wherein the medicament is for treating cancer or a skeletal disorder.

22. The use of claim 20, wherein the medicament is for use in inhibiting signaling induced by a first Wnt isoform and potentiating signaling induced by a second Wnt isoform.

23. The use of claim 21, wherein the cancer is selected from the group consisting of non-small cell lung cancer, breast cancer, pancreatic cancer, ovarian cancer, kidney cancer, and prostate cancer.

24. Use of

a) an isolated antibody that binds to LRP6 and inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt3 and Wnt3a, and

b) an isolated antibody that binds to LRP6 and inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b

in the manufacture of a medicament for the treatment of cancer.

25. Use of

a) an isolated antibody that binds to LRP6 and inhibits signaling induced Wnt3 and Wnt3a, and

b) an isolated antibody that binds to LRP6 and inhibits signaling induced by Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b

in the manufacture of a medicament for the treatment of cancer.

26. Use of

a) an isolated antibody that binds to LRP6 and inhibits signaling induced Wnt3 and Wnt3a, and

b) an isolated antibody that binds to LRP6 and inhibits signaling induced by Wnt 1, 2, 2b, 4, 6, 7a, 7b, 8a, 9a, 9b, 10a, and 10b

in the manufacture of a medicament for the treatment of cancer.

27. The use of claim 21, wherein the skeletal disorder is selected from the group consisting of osteoporosis, osteoarthritis, bone fractures, and bone lesions.

28. Use of the antibody of any one of claims 1-14 and a Wnt isoform in the manufacture of a medicament for potentiating Wnt signaling induced by the Wnt isoform in an individual.

29. An isolated antibody that binds to LRP6, wherein the antibody is selected from the group consisting of:

(i) an antibody comprising a VH selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13 and SEQ ID NO: 15;

(ii) an antibody comprising a VL selected from the group consisting SEQ ID NO: 10 and SEQ ID NO: 12;

(iii) an antibody comprising a VH selected from the group consisting of a VH from the heavy chain of SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, and SEQ ID NO: 15 and a VL selected from the group consisting of a VL from the light chain of SEQ ID NO: 10 and SEQ ID NO: 12;

(iv) an antibody comprising a VH comprising an amino acid sequence having at least 90% homology to an amino acid sequence of SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, and SEQ ID NO: 15;

(v) an antibody comprising a VL comprising an amino acid sequence having at least 90% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 10 and SEQ ID NO: 12; and

(vi) an antibody comprising a VH comprising an amino acid sequence having at least 90 % homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, SEQ ID NO: 15 and a VL comprising an amino acid sequence having at least 90% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 10 and SEQ ID NO: 12.

30. An isolated bispecific antibody that binds to two different regions of LRP6 wherein the antibody comprises a VH comprising the amino acid sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, and SEQ ID NO: 15.

31. The bispecific antibody of claim 30, wherein the antibody is selected from the group consisting of:

(i) an antibody comprising a first VH comprising the amino acid sequence of SEQ ID NO: 9 and a second VH comprising the amino acid sequence of SEQ ID NO: 15;

(ii) an antibody comprising a first VH comprising the amino acid sequence of SEQ ID NO: 11 and a second VH comprising the amino acid sequence of SEQ ID NO: 15; and

(iii) an antibody comprising a first VH comprising the amino acid sequence of SEQ ID NO: 13 and a second VH comprising the amino acid sequence of SEQ ID NO: 15.

32. The bispecific antibody of any of claims 30 - 31, wherein the antibody further comprises a VL comprising the amino acid sequence selected from the group consisting of SEQ ID NO: 10 and SEQ ID NO: 12.

33. An isolated bispecific antibody that binds to two different regions of LRP6 wherein the antibody comprises a VH comprising an amino acid sequence having at least 90% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, and SEQ ID NO: 15.

34. The bispecific antibody of claim 33, wherein the antibody is selected form the group consisting of:

(i) an antibody comprising a first VH comprising an amino acid sequence having at least 90% homology to an amino acid

sequence of SEQ ID NO: 9 and a second VH comprising an amino acid sequence having at least 90% homology to an amino acid sequence of SEQ ID NO: 15;

(ii) an antibody comprising a first VH comprising an amino acid sequence having at least 90% homology to an amino acid sequence of SEQ ID NO: 11 and a second VH comprising an amino acid sequence having at least 90 % homology to an amino acid sequence of SEQ ID NO: 15; and

(iii) an antibody comprising a first VH comprising an amino acid sequence having at least 90% homology to an amino acid sequence of SEQ ID NO: 13 and a second VH comprising an amino acid sequence having at least 90 % homology to an amino acid sequence of SEQ ID NO: 15.

35. The bispecific antibody of any of claims 33-34, wherein the antibody further comprises a VL comprising an amino acid sequence having at least 90% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 10, and SEQ ID NO: 12.

36. An isolated bispecific antibody that binds to two different regions of LRP6 wherein the antibody is selected from the group consisting of:

(i) an antibody comprising a first VH domain comprising at least one, at least two, or all three VH HVR sequences selected from (a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 17; (b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; and (c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 19 and a second VH domain comprising at least one, at least two, or all three VH HVR sequences selected from (d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22; (e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and (f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24;

(ii) an antibody comprising a first VH domain comprising all three VH HVR sequences from (a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 17; (b) HVR-H2 comprising the amino acid sequence SEQ ID NO: 18; (c) HVR-H3 comprising the amino acid sequence SEQ ID NO: 19 and comprising a second VH domain comprising all three VH HVR sequences from (d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22; (e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and (f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24;

(iii) an antibody comprising a first VH domain comprising at least one, at least two, or all three VH HVR sequences selected from (a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 17; (b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; (c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 21 and comprising a second VH domain comprising at least one, at least two, or all three VH HVR sequences selected from (d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22; (e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and (f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24;

(iv) an antibody comprising a first VH domain comprising all three VH HVR sequences from (a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 17; (b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; (c) HVR-H3 vSEQ ID NO: 21 and comprising a second VH domain comprising all three VH HVR sequences from (d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22; (e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and (f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24;

(v) an antibody comprising a first VH domain comprising at least one, at least two, or all three VH HVR sequences selected from (a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 20; (b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; (c) HVR-H3 SEQ ID NO: 19 and comprising a second VH domain comprising at least one, at least two, or all three VH HVR sequences selected from (d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22; (e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and (f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24; and

(vi) the antibody comprising a first VH domain comprising all three VH HVR sequences from (a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 20; (b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; (c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 19 and comprising a second VH domain comprising all three VH HVR sequences from (d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22; (e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and (f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24.

37. The bispecific antibody of claim 36, wherein the antibody is selected from the group consisting of:

(i) an antibody further comprising at least one, at least two, or all three VL HVR sequences selected from (a) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25; (b) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; (c) HVR-L3 SEQ ID NO: 27;

(ii) an antibody further comprising all three VL HVR sequences selected from (a) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25; (b) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; (c) HVR-L3 SEQ ID NO: 27;

(iii) an antibody further comprising at least one, at least two, or all three VL HVR sequences selected from (a) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25; (b) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; (c) HVR-L3 SEQ ID NO: 28; and

(iv) an antibody further comprising all three VL HVR sequences selected from (a) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25; (b) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; (c) HVR-L3 SEQ ID NO: 28.

38. An isolated bispecific antibody that binds to two different regions of LRP6, wherein the antibody comprises a first VH comprising the amino acid sequence of SEQ ID NO: 15 and a second VH selected from the group consisting of a VH comprising the amino acid sequence of SEQ ID NO: 9, SEQ ID NO: 11, and SEQ ID NO: 13.

39. The bispecific antibody of claim 38 further comprising a VL comprising the amino acid sequence of SEQ ID NO: 10 or SEQ ID NO: 12.

40. The bispecific antibody of claim 38 comprising a first VH comprising the amino acid sequence of SEQ ID NO: 15 and a second VH comprising the amino acid sequence of SEQ ID NO: 9, and a VL comprising the amino acid sequence of SEQ ID NO: 10.

41. The bispecific antibody of any one of claims 30-40, wherein the antibody is selected from a group consisting of:

(i) an antibody that inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt3 and Wnt3a and that inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b;

(ii) an antibody that inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt 4, 7a, 7b, and 10a; and

(iii) an antibody that inhibits autocrine Wnt signaling.

42. An isolated bispecific antibody that binds to LRP6 and inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt3 and Wnt3a and inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b.

43. The bispecific antibody of claim 41(iii), wherein the antibody inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt 4, 7a, 7b, and 10a.

44. An antibody that competes for binding to LRP6 with the bispecific antibody of any one of claims 30-43.

45. An antibody that binds to the same two epitopes as the bispecific antibody of any one of claims 30-43.

46. The antibody of claim 45, wherein one of the two epitopes comprises R28, E51, D52, V70, S71, E73, L95, S96, D98, E115, R141, and N185 of LRP6.

47. The antibody of claim 46, wherein one of the two epitopes comprises R28, E51, D52, V70, S71, E73, L95, S96, D98, E115, R141, N185, R29, W188, K202, P225, H226, S243, and F266 of LRP6.

48. An isolated nucleic acid encoding the anti-LRP6 antibody or bispecific antibody of any one of claims 1-14 or 29-47.

49. A host cell comprising the nucleic acid of claim 48.

50. A pharmaceutical formulation comprising the antibody or bispecific antibody of any one of claims 29-47 and a pharmaceutically acceptable carrier.

51. The antibody or bispecific antibody of any one of claims 29-47 for use as a medicament.

52. The antibody or bispecific antibody of any one of claims 29-47 for use in treating cancer.

~~53. Use of the antibody or bispecific antibody of any one of claims 29-47 in the~~ manufacture of a medicament.

54. Use the antibody or bispecific antibody of any one of claims 29-47 in the manufacture of a medicament for treating cancer.

55. The use of claim 54, wherein the cancer is selected from the group consisting of non-small cell lung cancer, breast cancer, pancreatic cancer, ovarian cancer, kidney cancer, and prostate cancer.

WHAT IS CLAIMED IS:

1. An isolated antibody that binds to LRP6, wherein the antibody is selected from the group consisting of :

(i) an antibody comprising
a VH comprising
(a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 17;
(b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; and
(c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 19,
and a VL comprising
(g) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25;
(h) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; and
(i) HVR-L3 comprising the amino acid sequence of SEQ ID NO: 27;

(ii) an antibody comprising
a VH comprising
(a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 17;
(b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; and
(c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 21,
and a VL comprising
(g) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25;
(h) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; and
(i) HVR-L3 comprising the amino acid sequence of SEQ ID NO: 28; and

(iii) an antibody comprising
a VH comprising
(a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 20;
(b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; and
(c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 19,
and a VL comprising
(g) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25;
(h) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; and
(i) HVR-L3 comprising the amino acid sequence of SEQ ID NO: 27;

2. The antibody of claim 1, wherein the antibody is selected from the group consisting of
(i) an antibody comprising a VH comprising an amino acid sequence having at least 90% homology to an the amino acid sequence of SEQ ID NO: 9 and a VL comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 10;
(ii) an antibody comprising a VH comprising an amino acid sequence having at least 90% homology to an the amino acid sequence of SEQ ID NO: 11 and a VL comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 12; and
(iii) an antibody comprising a VH comprising an amino acid sequence having at least 90% homology to an the amino acid sequence of SEQ ID NO: 13 and a VL comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 14.

3. The antibody of claim 1, wherein the antibody is selected from the group consisting of
(i) an antibody comprising a VH comprising the amino acid sequence of SEQ ID NO: 9 and a VL comprising the amino acid sequence of SEQ ID NO: 10;
(ii) an antibody comprising a VH comprising the amino acid sequence of SEQ ID NO: 11 and a VL comprising the amino acid sequence of SEQ ID NO: 12; and
(iii) an antibody comprising a VH comprising the amino acid sequence of SEQ ID NO: 13 and a VL comprising the amino acid sequence of SEQ ID NO: 14.

4. The antibody of any one of claims 1-3, wherein the antibody inhibits signaling induced by a first Wnt isoform and potentiates signaling induced by a second Wnt isoform.

5. The antibody of claim 4, wherein the first Wnt isoform is selected from the group consisting of Wnt3 and Wnt3a and the second Wnt isoform is selected from the group consisting of Wnt 1, 2, 2b, 4, 6, 7a, 7b, 8a, 9a, 9b, 10a, and 10b.

6. The antibody of any one of claims 1-5, wherein antibody binds to the E3-E4 region of LRP6.

7. An isolated antibody that binds to LRP6, wherein the antibody comprises a VH comprising
(a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22;
(b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and
(c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24,
and a VL comprising
(g) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25;
(h) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; and
(i) HVR-L3 comprising the amino acid sequence of SEQ ID NO: 27.

8. The antibody of claim 7, wherein the antibody comprises a VH comprising an amino acid sequence having at least 90% homology to an the amino acid sequence of SEQ ID NO: 15 and a VL comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 16.

9. The antibody of claim 7, wherein the antibody comprises a VH comprising the amino acid sequence of SEQ ID NO: 15 and a VL comprising the amino acid sequence of SEQ ID NO: 16.

10. The antibody of any one of claims 7-9, wherein the antibody inhibits signaling induced by a first Wnt isoform and potentiates signaling induced by a second Wnt isoform.

11. The antibody of claim 10, wherein the first Wnt isoform is selected from the group consisting of Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b and the second Wnt isoform is selected from the group consisting of Wnt3 and Wnt3a.

12. The antibody of any one of claims 7-11, wherein antibody binds to the E1-E2 region of LRP6.

13. An isolated bispecific antibody that binds to two different regions of LRP6, wherein the antibody comprises a first VH domain comprising
(a) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 20;
(b) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 18; and
(c) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 19,
a first VL domain comprising
(g) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25;
(h) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; and
(i) HVR-L3 comprising the amino acid sequence SEQ ID NO: 27,
a second VH domain comprising
(d) HVR-H1 comprising the amino acid sequence of SEQ ID NO: 22;
(e) HVR-H2 comprising the amino acid sequence of SEQ ID NO: 23; and
(f) HVR-H3 comprising the amino acid sequence of SEQ ID NO: 24,
and a second VL domain comprising
(g) HVR-L1 comprising the amino acid sequence of SEQ ID NO: 25;
(h) HVR-L2 comprising the amino acid sequence of SEQ ID NO: 26; and
(i) HVR-L3 comprising the amino acid sequence SEQ ID NO: 27.

14. The bispecific antibody of claim 13, wherein the antibody comprises
(a) a first VH comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 13,
(b) a first VL comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 14,
(c) a second VH comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 15, and
(d) a second VL comprising an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 14.

15. The bispecific antibody of claim 13, wherein the antibody comprises
(a) a first VH comprising the amino acid sequence SEQ ID NO: 13,
(b) a first VL comprising the amino acid sequence of SEQ ID NO: 14,
(c) a second VH comprising the amino acid sequence of SEQ ID NO: 15, and
(d) a second VL comprising the amino acid sequence of SEQ ID NO: 14.

16. The bispecific antibody of any one of claims 13-15, wherein the antibody inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt3 and Wnt3a and inhibits signaling induced by a Wnt isoform selected from the group consisting of Wnt 1, 2, 2b, 6, 8a, 9a, 9b, and 10b.

17. The bispecific antibody of any one of claims 13-16, wherein the antibody inhibits autocrine Wnt signaling.

18. The bispecific antibody of any one of claims 13-17, wherein the antibody binds to the E3-E4 region of LRP6 and to the E1-E2 region of LRP6.

19. An antibody that competes for binding to LRP6 with the bispecific antibody of any one of claims 13-18.

20. An antibody that binds to the same two epitopes as the bispecific antibody of any one of claims 13-19.

21. The antibody of claim 20, wherein one of the two epitopes comprises amino acid residues R28, E51, D52, V70, S71, E73, L95, S96, D98, E115, R141, and N185 of LRP6 (SEQ ID NO: 29).

22. The antibody of claim 21, wherein the one of the two epitopes further comprises R29, W188, K202, P225, H226, S243, and F266 of LRP6 (SEQ ID NO: 29).

23. The antibody or bispecific antibody of any one of claims 1-22 wherein the antibody is a monoclonal antibody.

24. The antibody or bispecific antibody of any one of claims 1-22, wherein the antibody is a chimeric, human or humanized antibody.

25. An isolated nucleic acid encoding the antibody or bispecific antibody of any of claims 1-24.

26. A host cell comprising the nucleic acid of claim 25.

27. A pharmaceutical formulation comprising the antibody or bispecific antibody of any of claims 1-24 and a pharmaceutically acceptable carrier.

28. The antibody or bispecific antibody of any of claims 1-24 for use as a medicament.

29. The antibody or bispecific antibody of any of claims 1-6 or 13-22 for use in treating cancer.

30. The antibody or bispecific antibody of claim 29, wherein the cancer is non-small cell lung cancer, breast cancer, pancreatic cancer, ovarian cancer, kidney cancer, or prostate cancer.

31. The antibody of any of claims 7-12 for use as a medicament useful in the treatment of a skeletal disorder.

32. The antibody of claim 32, wherein the skeletal disorder is osteoporosis, osteoarthritis, bone fractures, or bone lesions.

33. Use of the antibody or bispecific antibody of any of claims 1-24 in the manufacture of a medicament.

34. Use of the antibody or bispecific antibody of any of claims 1-6 or 13-22 in the manufacture of a medicament for treating cancer.

35. The use of claim 34, wherein the cancer is non-small cell lung cancer, breast cancer, pancreatic cancer, ovarian cancer, kidney cancer, or prostate cancer.

36. Use antibody of any of claims 7-12 in the manufacture of a medicament for treating askeletal disorder.

37. The antibody of claim 36, wherein the skeletal disorder is osteoporosis, osteoarthritis, bone fractures, or bone lesions.

38. An immunoconjugate comprising the antibody or bispecific antibody of any of claims 1-24 and a cytotoxic agent.