WHAT IS CLAIMED IS:

1. A monoclonal antibody or fragment thereof that competes for binding to human PCSK9 with:
(a) an antibody comprising a heavy chain variable region of the amino acid sequence in SEQ ID NO: 49; and a light chain variable region of the amino acid sequence in SEQ ID NO: 23; or
(b) an antibody comprising a heavy chain variable region of the amino acid sequence in SEQ ID NO: 67; and a light chain variable region of the amino acid sequence in SEQ ID NO: 12,
and wherein said monoclonal antibody or fragment thereof is neutralizing in that an excess of said monoclonal antibody or fragment thereof is capable of reducing the quantity of human PCSK9 bound to LDLR in an *in vitro* competitive binding assay.

2. A monoclonal antibody or fragment thereof that binds to human PCSK9, wherein the monoclonal antibody or fragment thereof, when bound to human PCSK9, is positioned 8 angstroms or less from at least one of the following residues of human PCSK9 (numbering in reference to SEQ ID NO: 3):
S153, I154, P155, R194, D238, A239, I369, S372, D374, C375, T377, C378, F379, V380, S381, W156, N157, L158, E159, H193, E195, H229, R237, G240, K243, D367, I368, G370, A371, S373, S376, Q382, W72, F150, A151, Q152, T214, R215, F216, H217, A220, S221, K222, S225, H226, C255, Q256, G257, K258, N317, F318, T347, L348, G349, T350, L351, E366, S383, G384, K69, D70, P71, S148, V149, D186, T187, E211, D212, G213, R218, Q219, C223, D224, G227, L253, N254, G259, P288, A290, G291, G316, R319, Y325, V346, G352, T353, G365, T385, S386, Q387, S188, I189, Q190, S191, D192, E197, G198, R199, V200, I196, M201, V202, T228, S235, G236, G244, or M247;
wherein said monoclonal antibody or fragment thereof is neutralizing in that an excess of said monoclonal antibody or fragment thereof is capable of reducing the quantity of human PCSK9 bound to LDLR in an *in vitro* competitive binding assay.

3. The monoclonal antibody or fragment thereof of claim 2, wherein the monoclonal antibody or fragment thereof, when bound to human PCSK9, is positioned 8 angstroms or less from at least one of the following residues of human PCSK9 (numbering in reference to SEQ ID NO: 3):

S153, I154, P155, R194, D238, A239, I369, S372, D374, C375, T377, C378, F379, V380, S381, W156, N157, L158, E159, H193, E195, H229, R237, G240, K243, D367, I368, G370, A371, S373, S376, or Q382.

4. The monoclonal antibody or fragment thereof of claim 2, wherein the monoclonal antibody is positioned 5 angstroms or less from at least one of the following residues of human PCSK9 (numbering in reference to SEQ ID NO: 3):
S153, I154, P155, R194, D238, A239, I369, S372, D374, C375, T377, C378, F379, V380, or S381.

5. The monoclonal antibody or fragment thereof of any one of claims 2 to 4, wherein the monoclonal antibody or fragment thereof, when bound to human PCSK9, is positioned within the recited distances from at least two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, or more of said residues of human PCSK9.

6. An antigen binding protein, wherein said antigen binding protein specifically binds to human PCSK9 and is neutralizing in that an excess of said antigen binding protein is capable of reducing the quantity of human PCSK9 bound to LDLR in an *in vitro* competitive binding assay, said antigen binding protein comprising either:
(i) a combination of a light chain variable domain and a heavy chain variable domain selected from the group of combinations consisting of:

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 9 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 71;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 10 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 72;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 12 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 67;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 13 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 87;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 16 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 52;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 17 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 51;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 20 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 54;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 21 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 55;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 22 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 56;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 23, and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 49;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 24 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 57;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 26 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 50;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 30 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 64;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 31 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 62;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 33 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 65;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 35 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 79;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 36 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 80;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 37 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 76;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 38 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 77;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 39 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 78;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 40 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 83;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 461 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 459;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 465, and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 463;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 473 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO:471;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 477 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO:475;

a light chain variable domain having a sequence with at least 90% identity to SEQ ID NO: 485 and a heavy chain variable domain having a sequence with at least 90% identity to SEQ ID NO:483;

(ii) a heavy chain complementarity determining region (CDR) of the CDRH1 sequence in SEQ ID NO: 49, a CDRH2 of the CDRH2 sequence in SEQ ID NO: 49,

and a CDRH3 of the CDRH3 sequence in SEQ ID NO: 49, and a light chain CDRL1 of the CDRL1 sequence in SEQ ID NO: 23, a CDRL2 of the CDRL2 sequence in SEQ ID NO: 23, and a CDRL3 of the CDRL3 sequence in SEQ ID NO: 23;

(iii) a heavy chain complementarity determining region (CDR) of the CDRH1 sequence in SEQ ID NO: 51, a CDRH2 of the CDRH2 sequence in SEQ ID NO: 51, and a CDRH3 of the CDRH3 sequence in SEQ ID NO: 51, and a light chain CDRL1 of the CDRL1 sequence in SEQ ID NO: 17, a CDRL2 of the CDRL2 sequence in SEQ ID NO: 17, and a CDRL3 of the CDRL3 sequence in SEQ ID NO: 17; or

(iv) a heavy chain complementarity determining region (CDR) of the CDRH1 sequence in SEQ ID NO: 459, a CDRH2 of the CDRH2 sequence in SEQ ID NO: 459, and a CDRH3 of the CDRH3 sequence in SEQ ID NO: 459, and a light chain CDRL1 of the CDRL1 sequence in SEQ ID NO: 461, a CDRL2 of the CDRL2 sequence in SEQ ID NO: 461, and a CDRL3 of the CDRL3 sequence in SEQ ID NO: 461.

7. An antigen binding protein, wherein said antigen binding protein comprises:

(a) a light chain variable domain comprising the amino acid sequence of SEQ ID NO: 23, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO: 49; or

(b) a light chain variable domain comprising the amino acid sequence of SEQ ID NO: 23, wherein the first residue is a glutamic acid instead of a glutamine, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO: 49, wherein the first residue is a glutamic acid instead of a glutamine.

8. The antigen binding protein of Claim 6, wherein the light chain variable domain and the heavy chain variable domain are selected from the group of combinations consisting of: a light chain variable domain having the sequence set forth in SEQ ID NO: 10 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 72; a light chain variable domain having the sequence set forth in SEQ ID NO: 12 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 67; a light chain variable domain having the sequence set forth in SEQ ID NO: 17 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 51; a light chain variable domain having the sequence set forth in SEQ ID NO: 23, and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 49; a light chain variable domain having the sequence set forth in SEQ ID NO: 35 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 79; a

light chain variable domain having the sequence set forth in SEQ ID NO: 461 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 459; and a light chain variable domain having the sequence set forth in SEQ ID NO: 465, and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 463; a light chain variable domain having the sequence set forth in SEQ ID NO: 485 and a heavy chain variable domain having the sequence set forth in SEQ ID NO:483, wherein the antigen binding protein specifically binds to the PCSK9.

9. An antigen binding protein comprising:
a heavy chain complementarity determining region (CDR) of the CDRH1 sequence in SEQ ID NO: 49, a CDRH2 of the CDRH2 sequence in SEQ ID NO: 49, and a CDRH3 of the CDRH3 sequence in SEQ ID NO: 49, and a light chain CDRL1 of the CDRL1 sequence in SEQ ID NO:23, a CDRL2 of the CDRL2 sequence in SEQ ID NO:23, and a CDRL3 of the CDRL3 sequence in SEQ ID NO:23, wherein the antigen binding protein specifically binds to human PCSK9 and is neutralizing in that an excess of antigen binding protein is capable of reducing the quantity of human PCSK9 bound to LDLR in an *in vitro* competitive binding assay.

10. An antigen binding protein comprising:
a heavy chain complementarity determining region (CDR) of the CDRH1 sequence in SEQ ID NO:51, a CDRH2 of the CDRH2 sequence in SEQ ID NO: 51, and a CDRH3 of the CDRH3 sequence in SEQ ID NO: 51, and a light chain CDRL1 of the CDRL1 sequence in SEQ ID NO:17, a CDRL2 of the CDRL2 sequence in SEQ ID NO:17, and a CDRL3 of the CDRL3 sequence in SEQ ID NO:17, wherein the antigen binding protein specifically binds to human PCSK9 and is neutralizing in that an excess of antigen binding protein is capable of reducing the quantity of human PCSK9 bound to LDLR in an *in vitro* competitive binding assay.

11. An antigen binding protein comprising:
a heavy chain complementarity determining region (CDR) of the CDRH1 sequence in SEQ ID NO: 459, a CDRH2 of the CDRH2 sequence in SEQ ID NO: 459, and a CDRH3 of the CDRH3 sequence in SEQ ID NO: 459, and a light chain CDRL1 of the CDRL1 sequence in SEQ ID NO:461, a CDRL2 of the CDRL2 sequence in SEQ ID NO:461, and a CDRL3 of the CDRL3 sequence in SEQ ID NO:461, wherein the antigen binding protein specifically binds to human PCSK9 and is neutralizing in that an excess of antigen binding protein is capable

of reducing the quantity of human PCSK9 bound to LDLR in an *in vitro* competitive binding assay.

12. The antigen binding protein of claim 9, wherein the antigen binding protein comprises all six of the following amino acid sequences: SEQ ID NO: 308, SEQ ID NO: 175, SEQ ID NO: 180, SEQ ID NO: 158, SEQ ID NO: 162, and SEQ ID NO: 395.

13. The antigen binding protein of claim 9, wherein the antigen binding protein comprises all six of the following amino acid sequences: SEQ ID NO: 368, SEQ ID NO: 175, SEQ ID NO: 180, SEQ ID NO: 158, SEQ ID NO: 162, and SEQ ID NO: 395.

14. The antigen binding protein of claim 9, wherein the antigen binding protein comprises: a CDRH1 comprising SEQ ID NO: 308, a CDRH2 comprising SEQ ID NO: 175, and a CDRH3 comprising SEQ ID NO: 180, and a CDRL1 comprising SEQ ID NO: 158, a CDRL2 comprising SEQ ID NO: 162, and a CDRL3 comprising SEQ ID NO: 395.

15. The antigen binding protein of claim 9, wherein the antigen binding protein comprises: a CDRH1 comprising SEQ ID NO: 368, a CDRH2 comprising SEQ ID NO: 175, and a CDRH3 comprising SEQ ID NO: 180, and a CDRL1 comprising SEQ ID NO: 158, a CDRL2 comprising SEQ ID NO: 162, and a CDRL3 comprising SEQ ID NO: 395.

16. The antigen binding protein of claim 9 comprising a light chain variable domain comprising the amino acid sequence of SEQ ID NO:23, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:49.

17. The antigen binding protein of claim 16 wherein the first residue of the light chain variable domain is a glutamic acid instead of a glutamine, and wherein the first residue of the heavy chain variable domain is a glutamic acid instead of a glutamine.

18. The antigen binding protein of claim 17, further comprising a glycine residue at the C-terminal end of said light chain variable domain.

19. The antigen binding protein of claim 10, wherein the antigen binding protein comprises all six of the following amino acid sequences: SEQ ID NO: 368, SEQ ID NO: 174, SEQ ID NO: 180, SEQ ID NO: 158, SEQ ID NO: 162, and SEQ ID NO:164.

20. The antigen binding protein of claim 10, wherein the antigen binding protein comprises: a CDRH1 comprising SEQ ID NO: 368, a CDRH2 comprising SEQ ID NO: 174, and a CDRH3 comprising SEQ ID NO: 180, and a CDRL1 comprising SEQ ID NO: 158, a CDRL2 comprising SEQ ID NO: 162, and a CDRL3 comprising SEQ ID NO: 164.

21. The antigen binding protein of claim 19 comprising a light chain variable domain comprising the amino acid sequence of SEQ ID NO:17, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:51.

22. The antigen binding protein of claim 11, wherein the antigen binding protein comprises all six of the following amino acid sequences: GFTFSSYWMS, SIKQDGSEKYYVDSVKG, DLVLMVYDIDYYYYGMDV, RSSQSLLHSNGYNYLD, LGSNRAS and MQALQTPLT.

23. The antigen binding protein of claim 11, wherein the antigen binding protein comprises: a CDRH1 comprising GFTFSSYWMS, a CDRH2 comprising SIKQDGSEKYYVDSVKG, and a CDRH3 comprising DLVLMVYDIDYYYYGMDV, and a CDRL1 comprising RSSQSLLHSNGYNYLD, a CDRL2 comprising LGSNRAS, and a CDRL3 comprising MQALQTPLT.

24. The antigen binding protein of claim 22 comprising a light chain variable domain comprising the amino acid sequence of SEQ ID NO:461, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:459.

25. An antigen binding protein comprising:

a) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:23, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:49; or

b) a light chain variable domain comprising the amino acid sequence of SEQ ID NO:23, wherein the first residue is a glutamic acid instead of a glutamine, and a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO:49, wherein the first residue is a glutamic acid instead of a glutamine.

26. The antigen binding protein of claim 25, further comprising a glycine residue at the C-terminal end of said light chain variable domain.

27. The antigen binding protein of any one of claims 6 to 26, further comprising:

(a) the light chain constant sequence of SEQ ID NO: 156;

(b) the light chain constant sequence of SEQ ID NO: 157;

(c) the heavy chain constant sequence of SEQ ID NO: 154;

(d) the heavy chain constant sequence of SEQ ID NO: 155;

(e) the light chain constant sequence of SEQ ID NO: 156 and the heavy chain constant sequence of SEQ ID NO: 154,

(f) the light chain constant sequence of SEQ ID NO: 157 and the heavy chain constant sequence of SEQ ID NO: 154;

(g) the light chain constant sequence of SEQ ID NO: 156 and the heavy chain constant sequence of SEQ ID NO: 155; or

(h) the light chain constant sequence of SEQ ID NO: 157 and the heavy chain constant sequence of SEQ ID NO: 155.

28. An isolated neutralizing human monoclonal antibody that binds to a human PCSK9 protein comprising a heavy chain polypeptide comprising residue 1 to residue 115 of SEQ ID NO:298 and a light chain polypeptide comprising residue 1 to 110 of SEQ ID NO:297.

29. The antigen binding protein of any one of the preceding claims, wherein the antigen binding protein is an LDLR competitive neutralizing antigen binding protein.

30. The monoclonal antibody or fragment thereof or the antigen binding protein of any one of the preceding claims, wherein the monoclonal antibody or fragment thereof or the antigen binding protein has at least one of the following characteristics:

(a) binds to a PCSK9 variant that has a D374Y point mutation;

(b) is selected from the group consisting of a human antibody, a humanized antibody, a chimeric antibody, a monoclonal antibody, a polyclonal antibody, a multispecific antibody, a recombinant antibody, an antigen-binding antibody fragment, a single chain antibody, a diabody, a Fab fragment, an $F(ab)_2$ fragment, an IgG1 antibody, an IgG2 antibody, and IgG3 antibody, and an IgG4 antibody;

(c) binds to PCSK9 with a K_d that is smaller than 1 nM, is smaller than 100 pM, is smaller than 10 pM, or is smaller than 5 pM; or

(d) can block the binding of D374Y PCSK9 to LDLR with an IC_{50} of less than 200 pM.

31. The monoclonal antibody or fragment thereof or the antigen binding protein of any one of the preceding claims that, when bound to human PCSK9:

(a) binds to PCSK9 with the same Kd as a reference antibody;

(b) inhibits binding of PCSK9 to LDLR with the same IC_{50} as said reference antibody; or

(c) cross-competes for binding with said reference antibody to PCSK9,

wherein said reference antibody comprises a combination of light chain and heavy chain variable domain sequences selected from the group consisting of a light chain variable domain having the sequence as set forth in SEQ ID NO: 10 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 72; a light chain variable domain having the sequence as set forth in SEQ ID NO: 12 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 67; a light chain variable domain having the sequence set forth in SEQ ID NO: 17 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 51; a light chain variable domain having the sequence set forth in SEQ ID NO: 23, and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 49; a light chain variable domain having the sequence set forth in SEQ ID NO: 35 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 79; a light chain variable domain having the sequence set forth in SEQ ID NO: 461 and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 459; a light chain variable domain having the sequence set forth in SEQ ID NO: 465, and a heavy chain variable domain having the sequence set forth in SEQ ID NO: 463; and a light chain variable domain having the sequence set forth in SEQ ID NO: 485 and a heavy chain variable domain having the sequence set forth in SEQ ID NO:483.

32. A nucleic acid encoding the monoclonal antibody or fragment thereof or the antigen binding protein of any one of the preceding claims.

33. A recombinant expression vector comprising the nucleic acid molecule according to claim 32.

34. A host cell comprising the vector of claim 33.

35. A hybridoma capable of producing the monoclonal antibody or fragment thereof or the antigen binding protein of claim 30.

36. A method of making the monoclonal antibody or fragment thereof or the antigen binding protein of any one of claims 1-31, comprising the step of preparing said monoclonal antibody or fragment thereof or the antigen binding protein from a host cell that secretes said monoclonal antibody or fragment thereof or antigen binding protein.

37. A monoclonal antibody or fragment thereof or an antigen binding protein produced by the expression of recombinant DNA in the host cell of claim 34 or the hybridoma of claim 35.

38. The method of claim 36 or the monoclonal antibody or fragment thereof or antigen binding protein of claim 37, wherein the host cell is selected from the group consisting of Chinese hamster ovary (CHO) cells, HeLa cells, baby hamster kidney (BHK) cells, monkey kidney cells (COS), human hepatocellular carcinoma cells, and human epithelial kidney 293 cells.

39. A pharmaceutical composition comprising at least one monoclonal antibody or fragment thereof or antigen binding protein according to any one of claims 1 to 31, or 37 and a pharmaceutically acceptable excipient.

40. The pharmaceutical composition of claim 39, wherein the pharmaceutical composition is administered prior to, concurrent with, or subsequent to, the administration of at least one other therapeutic agent, wherein optionally the other therapeutic agent is a statin.

41. A kit for the treatment of cholesterol related disorders comprising the composition of claims 39 or 40.

42. Use of the monoclonal antibody or fragment thereof or antigen binding protein of any one of claims 1 to 31 or 37 in the manufacture of a medicament for treating or preventing a condition associated with an elevated serum cholesterol level in a subject.

43. The use of claim 42, wherein the condition is selected from hypercholesterolemia, cardiovascular disease, metabolic syndrome, diabetes, stroke, and dyslipidemia.

44. An isolated neutralizing monoclonal antibody that binds to a PCSK9 protein comprising the amino acid sequence of SEQ ID NO: 1, wherein the neutralizing monoclonal antibody comprises:
a heavy chain polypeptide comprising the following complementarity determining regions (CDRs): a heavy chain CDR1 that is a CDR1 in SEQ ID NO: 49; a heavy chain CDR2 that is a CDR2 in SEQ ID NO: 49; a heavy chain CDR3 that is a CDR3 in SEQ ID NO: 49 and a light chain polypeptide comprising the following CDRs: a light chain CDR1 that is a CDR1 in SEQ ID NO: 23; a light chain CDR2 that a CDR2 in SEQ ID NO: 23; and a light chain CDR3 that is a CDR3 in SEQ ID NO: 23.

45. The isolated neutralizing monoclonal antibody of Claim 44, wherein the monoclonal antibody is a LDLR competitive neutralizing antigen binding protein.

46. A pharmaceutical composition comprising at least one monoclonal antibody according to Claim 44, and a pharmaceutically acceptable excipient.

47. The isolated neutralizing monoclonal antibody of Claim 44, wherein the heavy chain polypeptide comprises all three of the following amino acid sequences: SEQ ID NO: 308, SEQ ID NO: 175, and SEQ ID NO: 180.

48. The isolated neutralizing monoclonal antibody of Claim 44, wherein the heavy chain polypeptide comprises all three of the following amino acid sequences: SEQ ID NO: 368, SEQ ID NO: 175, and SEQ ID NO: 180.

49. The isolated neutralizing monoclonal antibody of Claim 44, wherein the light chain polypeptide comprises all three of the following amino acid sequences: SEQ ID NO: 158, SEQ ID NO: 162, and SEQ ID NO: 395.

50. The isolated neutralizing monoclonal antibody of Claim 49, wherein the heavy chain polypeptide comprises all three of the following amino acid sequences: SEQ ID NO: 308, SEQ ID NO: 175, and SEQ ID NO: 180.

51. The isolated neutralizing monoclonal antibody of Claim 49, wherein the heavy chain polypeptide comprises all three of the following amino acid sequences: SEQ ID NO: 368, SEQ ID NO: 175, and SEQ ID NO: 180.

52. The isolated neutralizing monoclonal antibody of Claim 44, wherein the heavy chain polypeptide comprises SEQ ID NO:49 and the light chain polypeptide comprises SEQ ID NO: 23.

53. The isolated neutralizing monoclonal antibody of Claim 44, wherein each CDR is defined in accordance with the Kabat definition, the Chothia definition, the combination of the Kabat definition and the Chothia definition, the AbM definition, or the contact definition of CDR.

54. The isolated neutralizing monoclonal antibody of Claim 53, wherein each CDR is defined in accordance with the CDR definition of Kabat.

55. The isolated neutralizing monoclonal antibody of Claim 53, wherein each CDR is defined in accordance with the CDR definition of Chothia.

56. The isolated neutralizing monoclonal antibody of Claim 53, wherein each CDR is defined in accordance with the combination of the Kabat definition and the Chothia definition.

57. The isolated neutralizing monoclonal antibody of Claim 44, wherein the monoclonal antibody is human.

58. The isolated neutralizing monoclonal antibody of Claim 44, wherein the monoclonal antibody is humanized.

59. An isolated neutralizing human monoclonal antibody that binds to a PCSK9 protein comprising:
a heavy chain polypeptide comprising:
the amino acid sequence of SEQ ID NO: 180;
the amino acid sequence of SEQ ID NO: 175; and
the amino acid sequence of SEQ ID NO: 308; and
a light chain polypeptide comprising:
the amino acid sequence of SEQ ID NO: 395;
the amino acid sequence of SEQ ID NO: 162; and
the amino acid sequence of SEQ ID NO: 158.

60. An isolated monoclonal antibody, wherein, when bound to human PCSK9, the monoclonal antibody binds to at least one of the following residues: S153, I154, P155, R194, D238, A239, I369, S372, D374, C375, T377, C378, F379, V380, or S381 of SEQ ID NO:3, and wherein the monoclonal antibody inhibits binding of human PCSK9 to LDLR.

61. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least S153.

62. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least I154.

63. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least P155.

64. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least T377.

65. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least R194.

66. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least D238.

67. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least A239.

68. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least I369.

69. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least S372.

70. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least D374.

71. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least C375.

72. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least C378.

73. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least F379.

74. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least V380.

75. The isolated monoclonal antibody of claim 60, wherein the monoclonal antibody binds to at least S381.

76. A pharmaceutical composition comprising the isolated monoclonal antibody of claim 60.

77. An isolated monoclonal antibody, wherein, the isolated monoclonal antibody binds to at least two of the following residues: S153, I154, P155, R194, D238, A239, I369, S372, D374, C375, T377, C378, F379, V380, or S381 of SEQ ID NO:3, and wherein the monoclonal antibody inhibits binding of human PCSK9 to LDLR.

78. An isolated monoclonal antibody, wherein, the isolated monoclonal antibody binds to at least four of the following residues: S153, I154, P155, R194, D238, A239, I369, S372, D374, C375, T377, C378, F379, V380, or S381 of SEQ ID NO:3, and wherein the monoclonal antibody inhibits binding of human PCSK9 to LDLR.

WHAT IS CLAIMED IS:

1. An isolated neutralizing antigen binding protein that binds to a PCSK9 protein comprising the amino acid sequence of SEQ ID NO: 1, wherein the neutralizing antigen binding protein decreases the LDLR lowering effect of PCSK9 on LDLR.

2. The isolated neutralizing antigen binding protein of any one of the antigen binding protein claims herein, wherein the antigen binding protein is a LDLR non-competitive neutralizing antigen binding protein.

3. The isolated neutralizing antigen binding protein of any one of the antigen binding protein claims herein, wherein the antigen binding protein is a LDLR competitive neutralizing antigen binding protein.

4. An antigen binding protein that selectively binds to PCSK9, wherein said antigen binding protein binds to PCSK9 with a K_d that is less than 100 pM.

5. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the antigen binding protein binds with a K_d that is less than 10 pM.

6. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the antigen binding protein binds with a K_d that is less than 5 pM.

7. An isolated antigen binding protein that binds to a PCSK9 protein of SEQ ID NO: 1, wherein the binding between said isolated antigen binding protein and a variant PCSK9 protein is less than 50% of the binding between the isolated antigen binding protein and the PCSK9 protein of SEQ ID NO: 1.

8. The isolated human antigen binding protein any one of the antigen binding protein claims herein, wherein the variant PCSK9 protein comprises at least one mutation of a residue at a position selected from the group consisting of 207, 208, 185, 181, 439, 513, 538, 539, 132, 351, 390, 413, 582, 162, 164, 167, 123, 129, 311, 313, 337, 519, 521, and 554, as shown in SEQ ID NO: 1.

9. The isolated human antigen binding protein of any one of the antigen binding protein claims herein, wherein the at least one mutation selected from the group consisting of R207E, D208R, E181R, R185E, R439E, E513R, V538R, E539R, T132R, S351R, A390R, A413R, and E582R

10. The isolated human antigen binding protein of any one of the antigen binding protein claims herein, wherein the at least one mutation is selected from the group consisting of D162R, R164E, E167R, S123R, E129R, A311R, D313R, D337R, R519E, H521R,and Q554R.

11. An antigen binding protein that binds to a PCSK 9 protein of SEQ ID NO: 303 in a first manner, wherein the antigen binding protein binds to a variant of PCSK9 in a second manner, wherein said PCSK9 variant has at least one point mutation at a position selected from the group consisting of: 207, 208, 185, 181, 439, 513, 538, 539, 132, 351, 390, 413, 582, 162, 164, 167, 123, 129, 311, 313, 337, 519, 521, and 554 of SEQ ID NO: 303, wherein the first manner comprises a first EC50, a first Bmax, or a first EC50 and a first Bmax, wherein the second manner comprises a second EC50, a second Bmax, or a second EC50 and a second Bmax, and wherein a value for the first manner is different from a value for the second manner.

12. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first manner comprises a first EC50, wherein the second manner involves a second EC50, and wherein the point mutation is selected from the group consisting of: R207E, D208R, E181R, R185E, R439E, E513R, V538R, E539R, T132R, S351R, A390R, A413R, and E582R.

13. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first EC50 is at least 20% different from the second EC50.

14. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first EC50 is at least 50% different from the second EC50.

15. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the second EC50 is a larger numerical value than the first EC50.

16. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first EC50 is determined by multiplex bead binding assay.

17. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the second EC50 is greater than 1 uM.

18. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the antigen binding protein is a neutralizing antigen binding protein.

19. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the neutralizing antigen binding protein is a competitive neutralizing antigen binding protein.

20. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the neutralizing antigen binding protein is a non-competitive neutralizing antigen binding protein.

21. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first manner comprises a first Bmax, wherein the second manner comprises a second Bmax that is different from the first Bmax, and wherein said PCSK9 variant has at least one point mutation selected from the group consisting of: D162R, R164E, E167R, S123R, E129R, A311R, D313R, D337R, R519E, H521R, and Q554R.

22. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the second Bmax is about 10% of the first Bmax.

23. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first Bmax is at least 20% different from the second Bmax.

24. The antigen binding protein of any one of the antigen binding protein claims herein, wherein the first Bmax is at least 50% different from the second Bmax.

25. An isolated antibody that binds to PCSK9 at a location that overlaps with a location that LDLR binds to PCSK9.

26. A neutralizing antibody that binds to PCSK9 and reduces a low density lipoprotein receptor (LDLR) lowering effect of PCSK9 on LDLR.

27. A neutralizing antibody that binds to PCSK9, wherein the antibody binds to PCSK9 at a location within residues 31-447 of SEQ ID NO: 3.

28. The antibody of Claim 27, wherein the antibody binds to an epitope within residues 31-447 of SEQ ID NO: 3.

29. A pharmaceutical composition comprising at least one antigen binding protein according to any one of Claims 1-28, and a pharmaceutically acceptable excipient.

30. A nucleic acid molecule encoding the antigen binding protein according to any one of Claims 1-28.

31 A method of making an antigen binding protein that binds to a PCSK9 protein comprising the amino acid sequence of SEQ ID NO: 1, wherein the antigen binding protein decreases the LDLR lowering effect of PCSK9 on LDLR, said method comprising:

providing a host cell comprising a nucleic acid sequence that encodes the antigen binding protein; and

maintaining the host cell under conditions in which the antigen binding protein is expressed.

32. A method of lowering serum cholesterol level in a subject, said method comprising administering to a subject an effective amount of an isolated neutralizing antigen binding protein that binds to a PCSK9 protein comprising the amino acid sequence of SEQ ID NO: 1, wherein the neutralizing antigen binding protein decreases the LDLR lowering effect of PCSK9 on LDLR.

33. A method for treating or preventing a condition associated with an elevated serum cholesterol level in a patient, comprising administering to a patient in need thereof an effective amount of an isolated neutralizing antigen binding protein that binds to a PCSK9 protein comprising the amino acid sequence of SEQ ID NO: 1, wherein the neutralizing antigen binding protein decreases the LDLR lowering effect of PCSK9 on LDLR.

34. A method for treating or preventing a condition associated with elevated serum cholesterol levels in a subject, said method comprising administering to a subject in need thereof an effective amount of an isolated neutralizing antigen binding protein simultaneously or sequentially with an agent that elevates the availability of LDLR protein, wherein the isolated antigen binding protein binds to a PCSK9 protein comprising the amino acid sequence of SEQ ID NO: 1, wherein the neutralizing antigen binding protein decreases the LDLR lowering effect of PCSK9 on LDLR.

35. The method of one of Claims 31-34, wherein the agent that elevates the availability of LDLR protein comprises a statin.

36. The method of one of Claims 31-35, wherein the statin is selected from the group consisting of atorvastatin, cerivastatin, fluvastatin, lovastatin, mevastatin, pitavastatin, pravastatin, rosuvastatin, simvastatin, and some combination thereof.

37. The use of an antigen binding protein of Claims 1-22 in the preparation of a medicament for the lowering of serum cholesterol.

38. The use of an antigen binding protein of Claims 1-22 in the preparation of a medicament for treating or preventing a condition associated with elevated serum cholesterol levels in a subject.