CLAIMS

1. An isolated antibody or antigen binding fragment thereof that binds to ~~a Scavenger Receptor Cysteine Rich (SRCR) domain (residues 424-519 of SEQ ID NO: 384) of~~ human ~~Macrophage Receptor with Collagenous Structure (~~MARCO~~)~~ (SEQ ID NO: 384), comprising three heavy chain complementarity determining regions (CDRs) (CDR-H1, CDR-H2, and CDR-H3) and three light chain complementarity determining regions (CDRs) (CDR-L1, CDR-L2, and CDR-L3), wherein the CDR-H1, CDR-H2, and CDR-H3 are from a heavy chain variable domain (VH) comprising the amino acid sequence set forth in SEQ ID NO: 61, 21, 31, 41, 51, 91, 121, 474, 1, 11, 71, 81, 101, 111, 131, 434, or 444; and wherein the CDR-L1, CDR-L2, and CDR-L3 are from a light chain variable domain (VL) comprising the amino acid sequence set forth in SEQ ID NO: 66, 26, 36, 46, 56, 96, 126, 479, 6, 16, 76, 86, 106, 116, 136, 439, or 449.

2. The isolated antibody of claim 1, wherein

a. the CDR-H1, CDR-H2, and CDR-H3, and the CDR-L1, CDR-L2, and CDR-L3 are defined according to AbM;

b. the CDR-H1, CDR-H2, and CDR-H3, and the CDR-L1, CDR-L2, and CDR-L3 are defined according to Kabat;

c. the CDR-H1, CDR-H2, and CDR-H3, and the CDR-L1, CDR-L2, and CDR-L3 are defined according to Chothia;

d. the CDR-H1, CDR-H2, and CDR-H3, and the CDR-L1, CDR-L2, and CDR-L3 are defined according to IMGT.

~~2~~**3.** The isolated antibody of claim 1, wherein ~~the antibody comprises a variable heavy chain (VH) sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a variable light chain (VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein~~:

a. CDR-H1 comprises the sequence GFSLTSYHVS (SEQ ID NO: 2),

b. CDR-H2 comprises the sequence AIWTGGSIA (SEQ ID NO: 3),

c. CDR-H3 comprises the sequence DLSDYYSSYTSFDY (SEQ ID NO: 4),

d. CDR-L1 comprises the sequence ASEGISNDLA (SEQ ID NO: 431) or XASEGISNDLA (SEQ ID NO: 383), wherein X is arginine (R) or leucine (L),

e. CDR-L2 comprises the sequence AASRLQS (SEQ ID NO: 528) or AASRLQD (SEQ ID NO: 8), and

f. CDR-L3 comprises the sequence QQSYKYPLT (SEQ ID NO: 9).

~~**3.** The isolated antibody of claim 1 or 2, wherein the antibody or antigen binding fragment thereof binds to at least one of the following residues: Q452, Y472, K473, E450, Q487, T499, H505, D507, S509, or E511 of MARCO (SEQ ID NO: 384).~~

~~**4.** The isolated antibody of claims 1-3, wherein the antibody or antigen binding fragment comprises a chimeric, human, humanized, or rat antibody or antigen binding fragment.~~

~~**5.** An isolated antibody or antigen binding fragment thereof that binds to human MARCO (SEQ ID NO: 384), comprising a variable heavy chain (VH) sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a variable light chain (VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein:~~

~~a. CDR-H1 comprises the sequence GFSLTSYHVS (SEQ ID NO: 2),~~

~~b. CDR-H2 comprises the sequence AIWTGGSIA (SEQ ID NO: 3),~~

~~c. CDR-H3 comprises the sequence DLSDYYSSYTSFDY (SEQ ID NO: 4),~~

~~d. CDR-L1 comprises the sequence ASEGISNDLA (SEQ ID NO: 431) or XASEGISNDLA (SEQ ID NO: 383), wherein X is arginine (R) or leucine (L)~~ ;

~~e. CDR-L2 comprises the sequence AASRLQD (SEQ ID NO: 8), and~~

~~f. CDR-L3 comprises the sequence QQSYKYPLT (SEQ ID NO: 9).~~

~~**6.** The isolated antibody of claim 5, wherein: CDR-L1 comprises the sequence ASEGISNDLA (SEQ ID NO: 431).~~

~~**7.** The isolated antibody of claim 5, wherein: CDR-L1 comprises the sequence RASEGISNDLA (SEQ ID NO: 27).~~

~~**8.** The isolated antibody of claim 5, wherein: CDR-L1 comprises the sequence LASEGISNDLA (SEQ ID NO: 7).~~

~~9~~4. The isolated antibody of ~~any one of claims 5-7~~claim 1, wherein the VH ~~sequence~~ comprises the ~~VH~~ sequence set forth in SEQ ID NO: 61; and the VL comprises the sequence set forth in SEQ ID NO: 66.

5. The isolated antibody of claim 1, wherein the VH chain sequence comprises the VH sequence shown in SEQ ID NO: 434; and the VL chain sequence comprises the VL sequence shown in SEQ ID NO: 439.

~~**10.** The isolated antibody of any one of claims 5-7, wherein the VH sequence comprises the VH sequence set forth in SEQ ID NO: 111.~~

~~11~~6. The isolated antibody of ~~any one of claims 5-8~~claim 1, wherein the VH ~~sequence~~ comprises a sequence selected from the sequences set forth in SEQ ID NO: 61, 21, 31, 41, 51, 91, 121, 474, 1, 11, 71, 81, 101, 111, 131, 434, or 444~~1, 11, 21, 31, 41, 51, 61, 71, 81, 91, 101, 111, 121, 131, 434, 444, and 474~~.

7. The isolated antibody of claim 1, wherein the VH comprises the sequence set forth in SEQ ID NO: 61.

8. The isolated antibody of claim 1, wherein the VL comprises a sequence selected from the sequences set forth in SEQ ID NO: 66, 26, 36, 46, 56, 96, 126, 479, 6, 16, 76, 86, 106, 116, 136, 439, or 449.

~~12~~9. The isolated antibody of ~~any one of claims 5-11~~claim 1, wherein the VL ~~sequence~~ comprises the ~~VL~~ sequence set forth in SEQ ID NO: 66.

~~**13.** The isolated antibody of any one of claims 5-11, wherein the VL sequence comprises the VL sequence set forth in SEQ ID NO: 116.~~

~~14~~10. The isolated antibody of ~~any one of claims 5-11~~claim 1, wherein the VH comprises a sequence selected from the sequences set forth in SEQ ID NO: 61, 21, 31, 41, 51, 91, 121, 474, 1, 11, 71, 81, 101, 111, 131, 434, or 444 and the VL ~~sequence~~ comprises a sequence selected from the sequences set forth in SEQ ID NO: 26, 36, 46, 56, 66, 96, 126, 479, 6, 16, 76, 86, 106, 116, 136, 439, or 449~~6, 16, 26, 36, 46, 57, 66, 76, 86, 96, 106, 116, 126, 136, 439, 449, and 479~~.

~~**15.** The isolated antibody of any one of claims 5-14, wherein the VH sequence comprises the VH sequence set forth in SEQ ID NO: 61; and the VL sequence comprises the VL sequence set forth in SEQ ID NO: 66.~~

~~**16.** The isolated antibody of any one of claims 5-14, wherein the VH sequence comprises the VH sequence set forth in SEQ ID NO: 111; and the VL sequence comprises the VL sequence set forth in SEQ ID NO: 116.~~

~~**17.** The isolated antibody of any one of claims 5-14, wherein the VH sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 1, 11, 21, 31, 41, 51, 61, 71, 81, 91, 101, 111, 121, 131, 434, 444, and 474 and the VL sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 6, 16, 26, 36, 46, 57, 66, 76, 86, 96 , 106, 116, 126, 136, 439, 449, and 479.~~

~~**18.** The isolated antibody of any one of claims 5-14, wherein the VH sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 1, 11, 21, 31, 41, 51, 61, 71, 81, 91, 101, 111, 121, 131, 434, 444, and 474 and/or the VL sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 6, 16, 26, 36, 46, 57, 66, 76, 86, 96 , 106, 116, 126, 136, 439, 449, and 479.~~

~~19~~**11.** The isolated antibody of ~~any one of claims 5-18~~claim 1, wherein the antibody comprises a heavy chain wherein the sequence of the heavy chain comprises the heavy chain sequence ~~as~~ set forth in SEQ ID NO: 65.

~~**20.** The isolated antibody of any one of claims 5-18, wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 115.~~

~~21~~**12.** The isolated antibody of ~~any one of claims 5-20~~claim 1, wherein the antibody comprises a heavy chain wherein the sequence of the heavy chain comprises the heavy chain sequence ~~selected from the sequences~~ set forth in SEQ ID NO: 65, 25, 35, 45, 55, 95, 125, 478, 5, 15, 75, 85, 105, 115, 135, 438, or 448~~5, 15, 125, 35, 45, 55, 65, 75, 85, 95, 105, 115, 125, 145, 438, 448, and 478~~.

~~22~~**13.** The isolated antibody of ~~any one of claims 5-21~~claim 1, wherein the antibody comprises a light chain wherein the sequence of the light chain comprises the light chain sequence ~~as~~ set forth in SEQ ID NO: 70.

~~**23.** The isolated antibody of any one of claims 5-21, wherein the antibody comprises a light chain sequence as set forth in SEQ ID NO: 120.~~

~~24~~**14.** The isolated antibody of ~~any of claims 5-23~~claim 1, wherein the antibody comprises a light chain wherein the sequence of the light chain comprises the light chain ~~selected from the~~

sequence~~s~~ set forth in SEQ ID NO: 70, 30, 40, 50, 60, 100, 130, 483, 10, 20, 80, 90, 110, 120, 140, 443, or 453~~10, 20, 30, 40, 50, 6, 70, 80, 90, 100, 110, 120, 130, 140, 443, 453, and 483~~.

~~25~~15. The isolated antibody of ~~any one of claims 5-24~~claim 1, wherein the antibody comprises a heavy chain and a light chain, wherein the sequence of the heavy chain comprises the heavy chain sequence ~~as~~ set forth in SEQ ID NO: 65; and the sequence of the light chain comprises the ~~a~~ light chain sequence ~~as~~ set forth in SEQ ID NO: 70.

~~**26.** The isolated antibody of any one of claims 5-24, wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 115; and a light chain sequence as set forth in SEQ ID NO: 120.~~

~~27~~16. The isolated antibody of ~~any one of claims 5-24~~claim 1, wherein the antibody comprises a heavy chain and a light chain, wherein the sequence of the heavy chain comprises the heavy chain sequence ~~selected from the sequences~~ set forth in SEQ ID NO: 65, 25, 35, 45, 55, 95, 125, 478, 5, 15, 75, 85, 105, 115, 135, 438, or 448~~5, 15, 125, 35, 45, 55, 65, 75, 85, 95, 105, 115, 125, 145, 438, 448, and 478~~; and the sequence of the light chain comprises the ~~a~~ light chain sequence ~~selected from the sequences~~ set forth in SEQ ID NO: 70, 30, 40, 50, 60, 100, 130, 483, 10, 20, 80, 90, 110, 120, 140, 443, or 453~~10, 20, 30, 40, 50, 6, 70, 80, 90, 100, 110, 120, 130, 140, 443, 453, and 483~~.

~~**28.** The isolated antibody of any one of claims 5-24, wherein the antibody comprises a heavy chain sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 5, 15, 125, 35, 45, 55, 65, 75, 85, 95, 105, 115, 125, 145, 438, 448, and 478; and/or a light chain sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 10, 20, 30, 40, 50, 6, 70, 80, 90, 100, 110, 120, 130, 140, 443, 453, and 483.~~

~~**29.** An isolated antibody or antigen binding fragment thereof that binds to human MARCO (SEQ ID NO: 384), comprising a variable heavy chain (VH) sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a variable light chain (VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein:~~

~~a. CDR-H1 comprises the sequence GYTFTDYAVN (SEQ ID NO: 232),~~

~~b. CDR-H2 comprises the sequence WINTQTGKPT (SEQ ID NO: 233),~~

~~c. CDR-H3 comprises the sequence DSYYYSSSLDY (SEQ ID NO: 234),~~

d. CDR-L1 comprises the sequence ASAGISNDLA (SEQ ID NO: 432) or XASAGISNDLA (SEQ ID NO: 381), wherein X is arginine (R) or leucine (L),

e. CDR-L2 comprises the sequence AASRLQD (SEQ ID NO: 238), and

f. CDR-L3 comprises the sequence QQSYKYPWT (SEQ ID NO: 239).

30. The isolated antibody of claim 29, wherein: CDR-L1 comprises the sequence ASAGISNDLA (SEQ ID NO: 432).

31. The isolated antibody of claim 29, wherein: CDR-L1 comprises the sequence RASAGISNDLA (SEQ ID NO: 317).

32. The isolated antibody of claim 29, wherein: CDR-L1 comprises the sequence LASAGISNDLA (SEQ ID NO: 237).

33. The isolated antibody of any one of claims 29-32, wherein the VH sequence comprises the VH sequence as set forth in SEQ ID NO: 454.

34. The isolated antibody of any one of claims 29-32, wherein the VH sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 241, 311, 321, 331, 341, 351, 454, and 464.

35. The isolated antibody of any one of claims 29-34, wherein the VL sequence comprises the VL sequence as set forth in SEQ ID NO: 459.

36. The isolated antibody of any one of claims 29-34, wherein the VL sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 246, 316, 326, 336, 346, 356, 459, and 469.

37. The isolated antibody of any one of claims 29-36, wherein the VH sequence comprises the VH sequence as set forth in SEQ ID NO: 454; and the VL sequence comprises the VL sequence as set forth in SEQ ID NO: 459.

38. The isolated antibody of any one of claims 29-36, wherein the VH sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 241, 311, 321, 331, 341, 351, 454, and 464, and the VL sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 246, 316, 326, 336, 346, 356, 459, and 469.

39. The isolated antibody of any one of claims 29-36, wherein the VH sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected

from the sequences set forth in SEQ ID NO: 241, 311, 321, 331, 341, 351, 454, and 464; and/or the VL sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 246, 316, 326, 336, 346, 356, 459, and 469.

40. The isolated antibody of any one of claims 29-38 wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 458.

41. The isolated antibody of any one of claims 29-38, wherein the antibody comprises a heavy chain sequence selected from the sequences set forth in SEQ ID NO: 245, 315, 325, 335, 345 355, 458, and 468.

42. The isolated antibody of any one of claims 29-41 wherein the antibody comprises a light chain sequence as set forth in SEQ ID NO: 463.

43. The isolated antibody of any one of claims 29-41, wherein the antibody comprises a light chain sequence selected from the sequences set forth in SEQ ID NO: 250, 320, 330, 340, 350, 360, 463, and 473.

44. The isolated antibody of any one of claims 29-43, wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 458; and a light chain sequence as set forth in SEQ ID NO: 463.

45. The isolated antibody of any one of claims 29-43, wherein the antibody comprises a heavy chain sequence selected from the sequences set forth in SEQ ID NO: 245, 315, 325, 335, 345 355, 458, and 468; and a light chain sequence selected from the sequences set forth in SEQ ID NO: 250, 320, 330, 340, 350, 360, 463, and 473.

46. The isolated antibody of any one of claims 29-43, wherein the antibody comprises a heavy chain sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 245, 315, 325, 335, 345 355, 458, and 468; and/or a light chain sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 250, 320, 330, 340, 350, 360, 463, and 473.

47. An isolated antibody or antigen binding fragment thereof that binds to human MARCO (SEQ ID NO: 384), comprising a variable heavy chain (VH) sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a variable light chain

(VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein:

a. CDR-H1 comprises the sequence KFTFSNYGMN (SEQ ID NO: 142),

b. CDR-H2 comprises the sequence LIYYNSNNKY (SEQ ID NO: 143),

c. CDR-H3 comprises the sequence SLTGGSDYFDS (SEQ ID NO: 144),

d. CDR-L1 comprises the sequence ASKSIGTFLA (SEQ ID NO: 433) or XASKSIGTFLA (SEQ ID NO: 382), wherein X is arginine (R) or lysine (K),

e. CDR-L2 comprises the sequence SGSTLQS (SEQ ID NO: 148), and

f. CDR-L3 comprises the sequence QQHDEYPFT (SEQ ID NO: 149).

48. The isolated antibody of claim 47, wherein: CDR-L1 comprises the sequence ASKSIGTFLA (SEQ ID NO: 433).

49. The isolated antibody of claim 47, wherein: CDR-L1 comprises the sequence KASKSIGTFLA (SEQ ID NO: 147).

50. The isolated antibody of claim 47, wherein: CDR-L1 comprises the sequence RASKSIGTFLA (SEQ ID NO: 157).

51. The isolated antibody of any one of claims 47-50, wherein the VH sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 141, 151, 161, 171, 181, 191, 201, 211, and 221.

52. The isolated antibody of any one of claims 47-51, wherein the VL sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 146, 156, 166, 176, 186, 196, 206, 216, and 226.

53. The isolated antibody of any one of claims 47-52, wherein the VH sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 141, 151, 161, 171, 181, 191, 201, 211, and 221 and the VL sequence comprises a sequence selected from the sequences set forth in SEQ ID NO: 146, 156, 166, 176, 186, 196, 206, 216, and 226.

54. The isolated antibody of any one of claims 47-52, wherein the VH sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 141, 151, 161, 171, 181, 191, 201, 211, and 221 and/or the VL sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or

99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 146, 156, 166, 176, 186, 196, 206, 216, and 226.

55. The isolated antibody of any one of claims 47-54, wherein the antibody comprises a heavy chain sequence selected from the sequences set forth in SEQ ID NO: 145, 155, 165, 175, 185, 195, 205, 215, and 225.

56. The isolated antibody of any one of claims 47-55, wherein the antibody comprises a light chain sequence selected from the sequences set forth in SEQ ID NO: 150, 160, 170, 180, 190, 200, 210, 220, and 230.

57. The isolated antibody of any one of claims 47-56, wherein the antibody comprises a heavy chain sequence selected from the sequences set forth in SEQ ID NO: 145, 155, 165, 175, 185, 195, 205, 215, and 225 and a light chain sequence selected from the sequences set forth in SEQ ID NO: 150, 160, 170, 180, 190, 200, 210, 220, and 230.

58. The isolated antibody of any one of claims 47-54, wherein the antibody comprises a heavy chain sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 145, 155, 165, 175, 185, 195, 205, 215, and 225 and/or a light chain sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence selected from the sequences set forth in SEQ ID NO: 150, 160, 170, 180, 190, 200, 210, 220, and 230.

59. An isolated antibody or antigen binding fragment thereof that binds to human MARCO (SEQ ID NO: 384), comprising a a variable heavy chain (VH) sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a variable light chain (VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein:

a. CDR-H1 comprises the sequence GYTFTDYYLH (SEQ ID NO: 252),

b. CDR-H2 comprises the sequence YINPNNAYTS (SEQ ID NO: 253),

c. CDR-H3 comprises the sequence DTTDYYNLHFAY (SEQ ID NO: 254),

d. CDR-L1 comprises the sequence LTSEGISNDLA (SEQ ID NO: 257),

e. CDR-L2 comprises the sequence DASRLED (SEQ ID NO: 258), and

f. CDR-L3 comprises the sequence QQSYKYPLT (SEQ ID NO: 259).

60. The isolated antibody of claim 59, wherein the VH sequence comprises a sequence as set forth in SEQ ID NO: 251 or 261.

61. The isolated antibody of claim 59 or 60, wherein the VL sequence comprises a sequence as set forth in SEQ ID NO: 256 or 266.

62. The isolated antibody of any one of claims 59-61, wherein the VH sequence comprises a sequence as set forth in SEQ ID NO: 251 or 261, and the VL sequence comprises a sequence s set forth in SEQ ID NO: 256 or 266.

63. The isolated antibody of any one of claims 59-61, wherein the VH sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98, or 99% identity to a sequence as set forth in SEQ ID NO: 251 or 261, and/or the VL sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98, or 99% identity to a sequence set forth in SEQ ID NO: 256 or 266.

64. The isolated antibody of any one of claims 59-62, wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 255 or 265.

65. The isolated antibody of any one of claims 59-64, wherein the antibody comprises a light chain sequence as set forth in SEQ ID NO: 260 or 270.

66. The isolated antibody of any one of claims 59-65, wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 255 or 265; and a light chain sequence as set forth in SEQ ID NO: 260 or 270.

67. The isolated antibody of any one of claims 59-65, wherein the antibody comprises a heavy chain sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence as set forth in SEQ ID NO: 255 or 265; and a light chain sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence as set forth in SEQ ID NO: 260 or 270.

68. An isolated antibody or antigen binding fragment thereof that binds to human MARCO (SEQ ID NO: 384), comprising a a variable heavy chain (VH) sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a variable light chain (VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein:

a. CDR-H1 comprises the sequence GFSLTSYTLS (SEQ ID NO: 362),

b. CDR-H2 comprises the sequence AIWGGDNTD (SEQ ID NO: 363),

c. CDR-H3 comprises the sequence ELGGSFDY (SEQ ID NO: 364),

d. CDR-L1 comprises the sequence KTSQNINKKLD (SEQ ID NO: 367),

e. CDR-L2 comprises the sequence YTNNLQT (SEQ ID NO: 368), and

f. CDR-L3 comprises the sequence YQYDSGFT (SEQ ID NO: 369).

69. The isolated antibody of claim 68, wherein the VH sequence comprises a sequence as set forth in SEQ ID NO: 361 or 371.

70. The isolated antibody of claim 68 or 69, wherein the VL sequence comprises a sequence as set forth in SEQ ID NO: 366 or 376.

71. The isolated antibody of any one of claims 68-70, wherein the VH sequence comprises a sequence as set forth in SEQ ID NO: 361 or 371, and the VL sequence comprises a sequence s set forth in SEQ ID NO: 366 or 376.

72. The isolated antibody of any one of claims 68-70, wherein the VH sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98, or 99% identity to a sequence as set forth in SEQ ID NO: 361 or 371, and/or the VL sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98, or 99% identity to a sequence set forth in SEQ ID NO: 366 or 376.

73. The isolated antibody of any one of claims 68-72, wherein the antibody comprises a heavy chain sequence as set forth in SEQ ID NO: 365 or 375; and a light chain sequence as set forth in SEQ ID NO: 370 or 380.

74. The isolated antibody of any one of claims 68-72, wherein the antibody comprises a heavy chain sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence as set forth in SEQ ID NO: 365 or 375; and a light chain sequence comprises a sequence with at least 90%, 92%, 95%, 97%, 98%, or 99% identity to a sequence as set forth in SEQ ID NO: 370 or 380.

75. The isolated antibody of any of the above claims, wherein the antibody is a monoclonal antibody, a neutral antibody, an antagonistic antibody, an agonist antibody, a polyclonal antibody, an afucosylated antibody, a human antibody, a humanized antibody, a chimeric antibody, a full-length antibody, and an scFv.

76. The isolated antibody of any of the above claims, wherein the antibody is an scFv.

77. The isolated antibody of any of the above claims, wherein the antibody is a monoclonal antibody.

~~**78.** The isolated antibody of any of the above claims wherein the antibody is a humanized antibody.~~

~~**79.** The isolated antibody of any of the above claims wherein the antibody is a human antibody.~~

~~**80.** The isolated antibody of any of the above claims, wherein the antibody comprises an Fc region.~~

~~81~~17. The isolated antibody of ~~any of the above claims~~claim 1, wherein the ~~Fc region~~antibody comprises a human Fc region.

~~**82.** The isolated antibody of any of the above claims, wherein the antibody comprises an active human Fc region.~~

~~**83.** The isolated antibody of any of the above claims, wherein the antibody comprises a heavy chain human constant region of a class selected from IgG, IgA, IgD, IgE, and IgM.~~

~~**84.** The isolated antibody of any of the above claims, wherein the antibody comprises a human heavy chain constant region of the class IgG and a subclass selected from IgG1, IgG2, IgG3, and IgG4.~~

~~85~~18. The isolated antibody of claim ~~84~~1, wherein the human Fc region ~~comprises~~ is a wild-type~~,~~ human IgG1 Fc ~~region~~.

19. The isolated antibody of claim 1, wherein the antibody comprises a wild type human IgG1 Fc, and wherein the VH comprises the sequence set forth in SEQ ID NO: 61, and the VL comprises the sequence set forth in SEQ ID NO: 66.

20. The isolated antibody of claim 1, wherein the antibody comprises a wild type human IgG1 Fc, and wherein the VH comprises the sequence set forth in SEQ ID NO: 434, and the VL comprises the sequence set forth in SEQ ID NO: 439.

~~**86.** The isolated antibody of claim 84, wherein the human Fc region comprises a wild-type, human IgG4 Fc region.~~

~~**87.** The isolated antibody of any one of claims 80-86, wherein the Fc region comprises one or more amino acid substitutions, wherein the one or more substitutions result in increased antibody half-life, increased ADCC activity, increased ADCP activity, increased CDC activity, decreased ADCC activity, decreased ADCP activity, or decreased CDC activity compared with an Fc region without the one or more substitutions.~~

~~**88.** The isolated antibody of any one of claims 80-84, wherein the Fc region binds an Fcγ Receptor selected from the group consisting of: FcγRI, FcγRIIa, FcγRIIb, FcγRIIc, FcγRIIIa, and FcγRIIIb.~~

8921. The isolated antibody of ~~any of the above claims~~claim 1, wherein the antibody binds to human MARCO with a K_D of less than or equal to about 0.5, 1, 2, 3, 4, 5, 6, or $7x10^{-9}$ M, as measured by surface plasmon resonance (SPR) assay.

22. The isolated antibody of claim 1, wherein the antibody is humanized.

~~**90.** The isolated antibody of any of the above claims, wherein binding of the antibody to human MARCO is divalent cation dependent.~~

~~**91.** The isolated antibody of any one of claim 1-89, wherein binding of the antibody to human MARCO is divalent cation independent.~~

~~**92.** The isolated antibody of claim 90 or 91, wherein the divalent cation comprises $Ca2^+$ or $Mg2^+$.~~

~~**93.** The isolated antibody of any of the above claims, wherein the antibody binds an extracellular domain of human MARCO.~~

~~**94.** The isolated antibody of any of the above claims, wherein the antibody binds to soluble MARCO.~~

~~**95.** The isolated antibody of any of the above claims, wherein the antibody binds the SRCR domain of human MARCO, cynomolgus MARCO, or human and cynomolgus MARCO.~~

~~**96.** The isolated antibody of claim 95, wherein the antibody binds the SRCR domain (residues 424-519 of SEQ ID NO: 384) of human MARCO.~~

~~**97.** The isolated antibody of claim 96, wherein the antibody or antigen binding fragment thereof binds to at least one of: Q452, Y472, K473, E450, Q487, T499, H505, D507, S509, or E511 of MARCO (SEQ ID NO: 384).~~

~~**98.** The isolated antibody of any of the above claims, wherein the antibody has receptor-ligand blocking activity.~~

~~**99.** The isolated antibody of any of the above claims, wherein the antibody induces increased expression of at least one cytokine or chemokine upon contact with a cell as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.~~

100. The isolated antibody of claim 99, wherein the at least one cytokine or chemokine comprises at least one of IL-1α, IL-1β, IL-2, IL-4, IL-6, IL7R, IL-12, IL12-p70, IL-15, IL-18, IL-27, IP-10, IFN-γ, TNFα, MIP1-α, MIP1-β, MIP-2, CSF2, CSF3, G-CSF, M-CSF, CCL3, CCL4, CCL5, CCL20, CCL24, CXCL1, CXCL3, CXCL8, CXCL9, CXCL10, CXCL12, gro-alpha, MCP-1, MCP-3, LIF, or eotaxin.

101. The isolated antibody of any of the above claims, wherein upon cell contact the antibody induces increased NK cell activation, B cell regulation T cell proliferation, T cell activation, or T cell differentiation as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.

102. The isolated antibody of any of the above claims, wherein upon cell contact the antibody induces IL-2-STAT5 signaling, NF-kB signaling, TLR signaling, adhesion and motility signaling, cytoskeletal rearrangement signaling, TNFα signaling via NF-kB, IL-6-JAK-STAT3 signaling, SYK signaling, MAPK signaling, TPL2 signaling, calcium signaling, an IFNγ response, or an IFNα response as compared to an isotype control antibody.

103. The isolated antibody of any of the above claims, wherein upon cell contact the antibody decreases cell cycle pathway, cell survival, cell adhesion, Myc target pathway, E2F targets pathway, hypoxia, mTOR signaling pathway, PI3K-AKT signaling pathway, Src signaling pathway, PKC signaling pathway, epithelial to mesenchymal transition signaling pathway, oxidative phosphorylation, or MAPK signaling pathway as compared to an isotype control antibody.

104. The isolated antibody of any of the above claims, wherein upon cell contact the antibody induces inflammasome activation as determined by IL-1β and/or IL-18 secretion and/or phagocytosis as compared to an isotype control antibody.

105. The isolated antibody of any of the above claims, wherein upon cell contact the antibody induces repolarization of myeloid M2-like TAMS to M1-like tumor associated macrophages (TAMs), and/or repolarization of mMDSCs to pro-inflammatory monocytes as compared to an isotype control antibody.

106. The isolated antibody of any of the above claims, wherein upon cell contact the antibody increases CD8+ T cells, CD4+ T cells, NK cells, dendritic cells, MHCII+ macrophages, $MHCII^{high}$ monocytes, or $MHCII^{mid}$ monocytes as compared to an isotype control antibody.

107. The isolated antibody of any of the above claims, wherein upon cell contact the antibody increases macrophages, marginal zone macrophages, follicular B cells, and/or red pulp macrophages in the spleen as compared to an isotype control antibody.

108. The isolated antibody of any of the above claims, wherein upon cell contact the antibody decreases TAMs, tumor associated neutrophils (TANs), plasma B cells, marginal zone B cells, CD19+ B cells, MHCII+ monocytes, and/or MHCII+ macrophages as compared to an isotype control antibody.

109. The isolated antibody of any of the above claims, wherein upon administration to a subject the antibody induces an increased anti-tumor memory response as compared to an isotype control antibody.

110. The isolated antibody of any of the above claims, wherein a cell is a MARCO+ cell.

111. The isolated antibody of any of the above claims, wherein the cell is a human MARCO+ cell.

112. The isolated antibody of claim 110 or 111, wherein the MARCO + cell is a monocyte, a monocytic Myeloid Derived Suppressor Cell (mMDSC), or a macrophage.

113. The isolated antibody of claim 112, wherein the macrophage is a tumor associated macrophage (TAM) or a monocyte-derived macrophage (MDM).

114. The isolated antibody of any of the above claims, wherein the antibody binds to MARCO on the cell surface of a MARCO+ cell.

115. The isolated antibody of any one of the above claims, wherein the antibody:

a. competes for binding to human MARCO with humanized PI-HX-3011, PI-HX-3031, PI-HX-3043, PI-HX-3061, PI-HX-3092 antibody;

b. binds to human MARCO;

c. binds to cynomolgus MARCO;

d. binds to human and cynomolgus MARCO;

e. binds to the SRCR domain of human MARCO;

f. binds to the SRCR domain of cynomolgus MARCO;

g. binds to the SRCR domain of human and cynomolgus MARCO;

h. binds to human or cynomolgus MARCO in a divalent cation dependent manner;

i. binds to human or cynomolgus MARCO in a divalent cation independent manner;

j. stimulates MARCO signaling upon binding to a MARCO+ cell;

k. induces one or more immune signaling pathways upon binding to a MARCO+ cell;

l. induces cytokine or chemokine secretion upon binding to a MARCO+ cell, optionally wherein the cytokine or chemokine is IL-1α, IL-1β, IL-2, IL-4, IL-6, IL7R, IL-12, IL12-p70, IL-15, IL-18, IL-27, IP-10, IFN-γ, TNFα, MIP1-α, MIP1-β, MIP-2, CSF2, CSF3, G-CSF, M-CSF, CCL3, CCL4, CCL5, CCL20, CCL24, CXCL1, CXCL3, CXCL8, CXCL9, CXCL10, CXCL12, gro-alpha, MCP-1, MCP-3, LIF, or eotaxin;

m. induces increased NK cell activation, B cell regulation, T cell proliferation, T cell activation, or T cell differentiation upon binding to a MARCO+ cell;

n. induces IL-2-STAT5 signaling, NF-kB signaling, TLR signaling, adhesion and motility signaling, cytoskeletal rearrangement signaling, TNFα signaling via NF-kB, IL-6-JAK-STAT3 signaling, SYK signaling, MAPK signaling, TPL2 signaling, calcium signaling, an IFNγ response, or an IFNα response;

o. decreases a cell cycle pathway, cell survival, cell adhesion, Myc target pathway, E2F targets pathway, hypoxia, mTOR signaling pathway, PI3K-AKT signaling pathway, Src signaling pathway, PKC signaling pathway, epithelial to mesenchymal transition signaling pathway, oxidative phosphorylation, or MAPK signaling pathway;

p. induces inflammasome activation as determined by IL-1β and/or IL-18 secretion and/or phagocytosis;

q. induces repolarization of myeloid M2-like TAMs to M1-like TAMS, and/or repolarization of mMDSCs to pro-inflammatory monocytes;

r. modulates B cells in the spleen upon binding to a MARCO+ cell;

s. increases CD8+ T cells, CD4+ T cells, NK cells, dendritic cells, MHCII+ macrophages, MHCII^{high} monocytes, and/or MHCII^{mid} monocytes in the spleen and/or tumor;

t. increases macrophages, marginal zone macrophages, follicular B cells, and/or red pulp macrophages in the spleen and/or tumor;

u. decreases TAMs, tumor associated neutrophils, plasma B cells, marginal zone B cells, CD19+ B cells, MHCII- monocytes, and/or MHCII- macrophages in the spleen and/or tumor;

v. induces changes in cell adhesion, cytoskeletal, chemotaxis and cell migration upon binding to a MARCO+ cell;

w. induces cell signaling pathways comprising adhesion, migration, chemotaxis cell cycle, T cell receptor, phagocytosis, autophagy, and wnt pathways upon binding to a MARCO+ cell;

x. disables MARCO+ myeloid cells; or

y. is capable of any combination of a.-x.

116. The isolated antibody of any of the above claims for use as a medicament.

117. The isolated antibody of any of the above claims for use in the treatment of a cancer or infection.

118. The isolated antibody of any of the above claims for use in the treatment of a cancer, wherein the cancer is selected from a solid tumor and a liquid tumor.

119. An isolated polynucleotide or set of polynucleotides encoding the antibody of any of the above claims, a VH thereof, a VL thereof, a light chain thereof, a heavy chain thereof, or an antigen-binding portion thereof; optionally the isolated polynucleotide or set of polynucleotides is cDNA.

120. A vector or set of vectors comprising the polynucleotide or set of polynucleotides of claim 119.

121. A host cell comprising the polynucleotide or set of polynucleotides of claim 119 or the vector or set of vectors of claim 120.

~~122~~23. A method of producing an antibody comprising expressing the antibody of claim 1 from a ~~or antigen binding fragment thereof with the~~ host cell ~~of claim 121~~ and isolating the expressed antibody.

~~123~~24. A pharmaceutical composition comprising the ~~isolated~~ antibody ~~or antigen binding fragment thereof of any one~~ of claim~~s~~ 1 ~~to 118~~ and a pharmaceutically acceptable excipient.

~~124~~25. A kit comprising the ~~isolated~~ antibody ~~or antigen binding fragment thereof of any one~~ of claim~~s~~ 1 ~~to 118 or a pharmaceutical composition of claim 123~~ and instructions for use.

~~125. A method of increasing an immune response in a subject comprising administering to the subject a composition comprising an anti-human MARCO antibody or antigen binding fragment thereof.~~

~~126. The method of claim 125, wherein the composition comprises an antibody that binds to the SRCR domain (residues 424-519 of SEQ ID NO: 384) of human MARCO.~~

~~127. The method of claim 125 or 126, wherein the composition comprises the isolated antibody of any one of claims 11 to 118 or the pharmaceutical composition of claim 123.~~

~~128. The method of claim 127, wherein the antibody has receptor-ligand blocking activity.~~

~~129. The method of any one of claims 125-128, wherein the increased immune response is an adaptive immune response.~~

~~130. The method of any one of claims 125-128, wherein the increased immune response is an innate immune response.~~

~~131. The method of any one of claims 125-130, wherein the increased immune response comprises increased expression of at least one cytokine or chemokine by a cell as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.~~

~~132. The method of claim 131, wherein the at least one cytokine or chemokine comprises at least one of IL-1α, IL-1β, IL-2, IL-4, IL-6, IL7R, IL-12, IL12-p70, IL-15, IL-18, IL-27, IP-10, IFN-γ, TNFα, MIP1-α, MIP1-β, MIP-2, CSF2, CSF3, G-CSF, M-CSF, CCL3, CCL4, CCL5, CCL20, CCL24, CXCL1, CXCL3, CXCL8, CXCL9, CXCL10, CXCL12, gro-alpha, MCP-1, MCP-3, LIF, or eotaxin.~~

~~133. The method of any one of claims 125-129, wherein the increased immune response comprises increased NK cell activation, B cell regulation T cell proliferation, T cell~~

activation, or T cell differentiation as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.

134. The method of any one of claims 125-133, wherein upon cell contact the antibody induces In some embodiments, upon cell contact the antibody induces IL-2-STAT5 signaling, NF-kB signaling, TLR signaling, adhesion and motility signaling, cytoskeletal rearrangement signaling, TNFα signaling via NF-kB, IL-6-JAK-STAT3 signaling, SYK signaling, MAPK signaling, TPL2 signaling, calcium signaling, an IFNγ response, or an IFNα response as compared to an isotype control antibody.

135. The method of any one of claims 125-134, wherein upon cell contact the antibody decreases cell cycle pathway, cell survival, cell adhesion, Myc target pathway, E2F targets pathway, hypoxia, mTOR signaling pathway, PI3K-AKT signaling pathway, Src signaling pathway, PKC signaling pathway, epithelial to mesenchymal transition signaling pathway, oxidative phosphorylation, or MAPK signaling pathway as compared to an isotype control antibody.

136. The method of any one of claims 125-135, wherein upon cell contact the antibody induces inflammasome activation as determined by IL-1β and/or IL-18 secretion and/or phagocytosis as compared to an isotype control antibody.

137. The method of any one of claims 125-136, wherein upon cell contact the antibody induces repolarization of myeloid M2-like TAMs to M1-like TAMS, and/or repolarization of mMDSCs to pro-inflammatory monocytes as compared to an isotype control antibody.

138. The method of any one of claims 125-137, wherein upon cell contact the antibody increases increases CD8+ T cells, CD4+ T cells, NK cells, dendritic cells, MHCII+ macrophages, $MHCII^{high}$ monocytes, or $MHCII^{mid}$ monocytes as compared to an isotype control antibody.

139. The method of any one of claims 125-138, wherein upon cell contact the antibody increases macrophages, marginal zone macrophages, follicular B cells, and/or red pulp macrophages in the spleen as compared to an isotype control antibody.

140. The method of any one of claims 125-139, wherein upon cell contact the antibody decreases TAMs, tumor associated neutrophils, plasma B cells, marginal zone B cells, CD19+ B cells, MHCII- monocytes, and/or MHCII- macrophages as compared to an isotype control antibody.

141. The method of any one of claims 125-140, wherein the antibody induces an increased memory immune response.

142. The method of any one of claims 125-141, wherein the cell is a MARCO+ cell.

143. The method of any one of claims 125-142, wherein the cell is a human MARCO+ cell.

144. The method of claim 142 or 143, wherein the MARCO+ cells is a monocyte, a monocytic Myeloid Derived Suppressor Cell (mMDSC), or a macrophage.

145. The method of claim 144, wherein the macrophage is a tumor associated macrophage (TAM) or a monocyte-derived macrophage (MDM).

146. The method of any one of claims 125-145, wherein the antibody binds to MARCO on the cell surface of a MARCO + cell.

147. The method of any one of claims 125-146, wherein the subject is human.

148. The method of any one of claims 125-147, wherein the subject has cancer.

149. The method of claim 148, wherein the cancer is a solid cancer.

150. The method of claim 148 or 149, wherein the cancer is a liquid cancer.

151. The method of claim any one of claims 148-150, wherein the cancer is selected from the group consisting of: lung cancer, lung adeno carcinoma, lung squamous cell carcinoma, lung small cell carcinoma, kidney cancer, liver cancer, renal cell carcinoma, cervical cancer, ovarian cancer, colorectal cancer, colon cancer, neuroblastoma, breast cancer, triple negative breast cancer, basal-like breast cancer, gastric cancer, stomach cancer, bladder cancer, prostate cancer, skin cancer, lymphoma, Diffuse large B-cell lymphoma (DLBCL), small lymphocytic lymphoma, non-Hodgkin lymphoma, mesothelioma, pancreatic cancer, thyroid cancer, endometrial cancer, head and neck cancer, or head and neck squamous carcinoma (HNSC) cancer.

152. The method of claim 151, wherein the cancer is colon cancer, breast cancer, basal-like breast cancer, ovarian cancer, or gastric cancer.

153. The method of any one of claims 148-152, wherein MARCO is expressed at a higher level on a tumor immune cell as compared to a non-tumor immune cell.

154. The method of any one of claims 148-153, wherein IL-10 is expressed at a higher level on a tumor immune cell as compared to a non-tumor immune cell.

~~155. A method of treating cancer in a subject, comprising administering to the subject a composition comprising an anti-human MARCO antibody or antigen binding fragment thereof.~~

~~156. The method of claim 155, wherein the composition comprises an antibody that binds to the SRCR domain (residues 424-519 of SEQ ID NO: 384) of human MARCO.~~

~~157. The method of claim 155 or 156, wherein the composition comprises the antibody of any one of claims 1 to 118 or the pharmaceutical composition of claim 123.~~

~~158. A method of treating cancer in a subject, comprising administering to the subject a composition comprising the anti-human MARCO antibody or antigen binding fragment thereof of any one of claims 1 to 118 or the pharmaceutical composition of claim 123.~~

~~159. The method of any one of claims 155-158, wherein the subject has previously received, is concurrently receiving, or will subsequently receive an immunotherapy.~~

~~160. The method of claim 159, wherein the immunotherapy is at least one of: a checkpoint inhibitor; a checkpoint inhibitor of T cells; and an anti-PD1 antibody.~~

~~161. The method of claim 160, wherein the immunotherapy comprises an anti-PD1 antibody.~~

~~162~~26. ~~A method of~~Use of an antibody that competes for binding to human MARCO (SEQ ID NO: 384) in the manufacture of a medicament for treating cancer in a subject, ~~comprising administering~~wherein the medicament is to be administered to the subject ~~a composition comprising an anti-human MARCO antibody or antigen binding fragment thereof and an immunotherapy~~with a reference antibody, wherein the reference antibody comprises three heavy chain complementarity determining regions (CDRs) (CDR-H1, CDR-H2, and CDR-H3) and three light chain complementarity determining regions (CDRs) (CDR-L1, CDR-L2, and CDR-L3), wherein the CDR-H1, CDR-H2, and CDR-H3 are from a heavy chain variable domain (VH) comprising the amino acid sequence set forth in SEQ ID NO: 61, 21, 31, 41, 51, 91, 121, 474, 1, 11, 71, 81, 101, 111, 131, 434, or 444; and wherein the CDR-L1, CDR-L2, and CDR-L3 are from a light chain variable domain (VL) comprising the amino acid sequence set forth in SEQ ID NO: 66, 26, 36, 46, 56, 96, 126, 479, 6, 16, 76, 86, 106, 116, 136, 439, and 449.

~~163. The method of claim 162, wherein the composition comprises an antibody that binds to the SRCR domain (residues 424-519 of SEQ ID NO: 384) of human MARCO.~~

~~**164.** The method of claim 162 or 163, wherein the composition comprises the antibody of any one of claims 1 to 118 or the pharmaceutical composition of claim 123.~~

~~**165**~~**27.** The ~~method~~ use of ~~any one of claims 162-164~~claim 26, wherein the subject has previously received, is concurrently receiving, or will subsequently receive an immunotherapy, wherein the immunotherapy is at least one of: a checkpoint inhibitor; a checkpoint inhibitor of T cells; ~~and an~~ anti-PD1 antibody; anti-PDL1 antibody; anti-CTLA4 antibody; adoptive T cell therapy; CAR-T cell therapy; a dendritic cell vaccine; a monocyte vaccine; an antigen binding protein that binds both a T cell and an antigen presenting cell; a BiTE dual antigen binding protein; a toll-like receptor ligand; a cytokine; a cytotoxic therapy; a chemotherapy; a radiotherapy; a small molecule inhibitor; a small molecule agonist; an immunomodulator; and an epigenetic modulator.

~~**166**~~**28.** The ~~method~~ use of claim ~~165~~27, wherein the immunotherapy ~~comprises~~ is an anti-PD1 antibody, an anti-PDL1 antibody, or an anti-CTLA4 antibody.

29. Use of an antibody that competes for binding to human MARCO (SEQ ID NO: 384) in the manufacture of a medicament for increasing an immune response in a subject, wherein the medicament is to be administered to the subject with a reference antibody, wherein the reference antibody comprises three heavy chain complementarity determining regions (CDRs) (CDR-H1, CDR-H2, and CDR-H3) and three light chain complementarity determining regions (CDRs) (CDR-L1, CDR-L2, and CDR-L3), wherein the CDR-H1, CDR-H2, and CDR-H3 are from a heavy chain variable domain (VH) comprising the amino acid sequence set forth in SEQ ID NO: 61, 21, 31, 41, 51, 91, 121, 474, 1, 11, 71, 81, 101, 111, 131, 434, or 444; and wherein the CDR-L1, CDR-L2, and CDR-L3 are from a light chain variable domain (VL) comprising the amino acid sequence set forth in SEQ ID NO: 66, 26, 36, 46, 56, 96, 126, 479, 6, 16, 76, 86, 106, 116, 136, 439, and 449.

~~**167.** The method of any one of claims 155-190 ,wherein the subject is human.~~

~~**168.** The method of any one of claims 155-167, wherein the cancer is a solid cancer.~~

~~**169.** The method of any one of claims 155-168, wherein the cancer is a liquid cancer.~~

~~**170.** The method of claim any one of claims 155-169, wherein the cancer is selected from the group consisting of: lung cancer, lung adeno carcinoma, lung squamous cell carcinoma, lung small cell carcinoma, kidney cancer, liver cancer, renal cell carcinoma, cervical cancer, ovarian cancer, colorectal cancer, colon cancer, neuroblastoma, breast cancer, triple negative breast cancer, basal-like breast cancer, gastric cancer, stomach cancer, bladder cancer,~~

prostate cancer, skin cancer, lymphoma, Diffuse large B-cell lymphoma (DLBCL), small lymphocytic lymphoma, non-Hodgkin lymphoma, mesothelioma, pancreatic cancer, thyroid cancer, endometrial cancer, head and neck cancer, or head and neck squamous carcinoma (HNSC) cancer.

171. The method of claim 170, wherein the cancer is colon cancer, breast cancer, basal-like breast cancer, ovarian cancer, or gastric cancer.

172. The method of any one of claims 155-171, wherein MARCO is expressed at a higher level on a tumor immune cell as compared to a non-tumor immune cell.

173. The method of any one of claims 155-172, wherein IL-10 is expressed at a higher level on a tumor immune cell as compared to a non-tumor immune cell.

174. The method of any one of claims 155-173, wherein the antibody induces an increased anti-tumor memory response as compared to an isotype control antibody.

175. The method of claim any one of claims 155-174, wherein the administration increases an immune response in the subject as compared to an isotype control antibody.

176. The method of claim 175, wherein the increased immune response is an adaptive immune response.

177. The method of claim 175, wherein the increased immune response is an innate immune response.

178. The method of any one of claims 175-177, wherein the increased immune response comprises expression of at least one cytokine or chemokine by a cell as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.

179. The method of claim 178, wherein the at least one cytokine or chemokine comprises at least one of IL-1α, IL-1β, IL-2, IL-4, IL-6, IL7R, IL-12, IL12-p70, IL-15, IL-18, IL-27, IP-10, IFN-γ, TNFα, MIP1-α, MIP1-β, MIP-2, CSF2, CSF3, G-CSF, M-CSF, CCL3, CCL4, CCL5, CCL20, CCL24, CXCL1, CXCL3, CXCL8, CXCL9, CXCL10, CXCL12, gro-alpha, MCP-1, MCP-3, LIF, or eotaxin.

180. The method of any one of claims 175-179, wherein the increased immune response comprises increased NK cell activation, B cell regulation T cell proliferation, T cell activation, or T cell differentiation as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.

181. The method of any one of claims 175-180, wherein upon cell contact the antibody induces In some embodiments, upon cell contact the antibody induces IL-2-STAT5 signaling, NF-kB signaling, TLR signaling, adhesion and motility signaling, cytoskeletal rearrangement signaling, TNFα signaling via NF-kB, IL-6-JAK-STAT3 signaling, SYK signaling, MAPK signaling, TPL2 signaling, calcium signaling, an IFNγ response, or an IFNα response as compared to an isotype control antibody.

182. The method of any one of claims 175-181, wherein upon cell contact the antibody decreases cell cycle pathway, cell survival, cell adhesion, Myc target pathway, E2F targets pathway, hypoxia, mTOR signaling pathway, PI3K-AKT signaling pathway, Src signaling pathway, PKC signaling pathway, epithelial to mesenchymal transition signaling pathway, oxidative phosphorylation, or MAPK signaling pathway as compared to an isotype control antibody.

183. The method of any one of claims 175-182, wherein upon cell contact the antibody induces inflammasome activation as determined by IL-1β and/or IL-18 secretion and/or phagocytosis as compared to an isotype control antibody.

184. The method of any one of claims 175-183, wherein upon cell contact the antibody induces repolarization of myeloid M2-like TAMs to M1-like TAMS, and/or repolarization of mMDSCs to pro-inflammatory monocytes as compared to an isotype control antibody.

185. The method of any one of claims 175-184, wherein upon cell contact the antibody increases CD8+ T cells, CD4+ T cells, NK cells, dendritic cells, MHCII+ macrophages, $MHCII^{high}$ monocytes, or $MHCII^{mid}$ monocytes as compared to an isotype control antibody.

186. The method of any one of claims 175-185, wherein upon cell contact the antibody increases macrophages, marginal zone macrophages, follicular B cells, and/or red pulp macrophages in the spleen as compared to an isotype control antibody.

187. The method of any one of claims 175-186, wherein upon cell contact the antibody decreases TAMs, tumor associated neutrophils, plasma B cells, marginal zone B cells, CD19+ B cells, MHCII- monocytes, and/or MHCII- macrophages as compared to an isotype control antibody.

188. The method of any one of claims 155-187, wherein the cell is a MARCO+ cell.

189. The method of claim 188, wherein the cell is a human MARCO+ cell.

190. The method of claim 188 or 189, wherein the MARCO+ cell is a monocyte, a monocytic Myeloid Derived Suppressor Cell (mMDSC), or a macrophage.

191. The method of claim 190, wherein the macrophage is a tumor associated macrophage (TAM) or a monocyte-derived macrophage (MDM).

192. The method of any one of claims 155-191, wherein the antibody binds to MARCO on the cell surface of a MARCO + cell.

193. A method of disabling myeloid cells that express MARCO on the cell surface, comprising contacting the myeloid cells with an anti-human MARCO antibody or antigen-binding fragment thereof.

194. A method of disabling myeloid cells that express MARCO on the cell surface, comprising contacting the myeloid cells with the antibody of any one of claims 1 to 118 or the pharmaceutical composition of claim 123.

195. The method of claim 193 or 194, wherein the antibody disables the myeloid cells by at least one of ADCC activity, CDC activity, or ADCP activity, optionally wherein the antibody disables the myeloid cells by ADCC activity, optionally wherein the antibody disables the myeloid cells by CDC activity, and optionally wherein the antibody disables the myeloid cells by ADCP activity.

196. The method of any one of claims 193-195, wherein the myeloid cell is a MARCO+ cell.

197. The method of claim 196, wherein the myeloid cell is a human MARCO+ cell.

198. The method of any one of claims 193-197, wherein the myeloid cell is a monocyte, a monocytic Myeloid Derived Suppressor Cell (mMDSC), or a macrophage.

199. The method of claim 198, wherein the macrophage is a tumor associated macrophage (TAM) or a monocyte-derived macrophage (MDM).

200. The method of any one of claims 193-199, wherein the myeloid cells are intratumoral or splenic myeloid cells.

201. The method of claim 200, wherein the contacting is *in vitro* or *in vivo*.

202. The method of claim 201, wherein the contacting occurs *in vivo* in a subject, optionally wherein the subject has cancer.

203. The method of claim 202, wherein the subject is a human.

204. The method of claim 202, wherein the cancer is a solid cancer.

205. The method of claim 202, wherein the cancer is a liquid cancer.

206. The method of claim any one of claims 202-205, wherein the cancer is selected from the group consisting of: lung cancer, lung adeno carcinoma, lung squamous cell carcinoma, lung small cell carcinoma, kidney cancer, liver cancer, renal cell carcinoma, cervical cancer, ovarian cancer, colorectal cancer, colon cancer, neuroblastoma, breast cancer, triple negative breast cancer, basal-like breast cancer, gastric cancer, stomach cancer, bladder cancer, prostate cancer, skin cancer, lymphoma, Diffuse large B-cell lymphoma (DLBCL), small lymphocytic lymphoma, non-Hodgkin lymphoma, mesothelioma, pancreatic cancer, thyroid cancer, endometrial cancer, head and neck cancer, or head and neck squamous carcinoma (HNSC) cancer.

207. The method of claim 206, wherein the cancer is colon cancer, breast cancer, basal-like breast cancer, ovarian cancer, or gastric cancer.

208. The method of any one of claims 194-207, wherein the contacting increases an immune response in the subject as compared to an isotype control antibody.

209. The method of claim 208, wherein the increased immune response is an adaptive immune response.

210. The method of claim 208, wherein the increased immune response is an innate immune response.

211. The method of any one of claims 208-210, wherein the increased immune response comprises expression of at least one cytokine or chemokine by a cell as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.

212. The method of claim 211, wherein the at least one cytokine or chemokine comprises at least one of IL-1α, IL-1β, IL-2, IL-4, IL-6, IL7R, IL-12, IL12-p70, IL-15, IL-18, IL-27, IP-10, IFN-γ, TNFα, MIP1-α, MIP1-β, MIP-2, CSF2, CSF3, G-CSF, M-CSF, CCL3, CCL4, CCL5, CCL20, CCL24, CXCL1, CXCL3, CXCL8, CXCL9, CXCL10, CXCL12, gro-alpha, MCP-1, MCP-3, LIF, or eotaxin.

213. The method of any one of claims 208-212, wherein the increased immune response comprises increased NK cell activation, B cell regulation T cell proliferation, T cell activation, or T cell differentiation as compared to an isotype control antibody, optionally as measured by a nucleic acid or protein assay.

214. The method of any one of claims 208-213, wherein upon cell contact the antibody IL-2-STAT5 signaling, NF-kB signaling, TLR signaling, adhesion and motility signaling, cytoskeletal rearrangement signaling, TNFα signaling via NF-kB, IL-6-JAK-STAT3 signaling, SYK signaling, MAPK signaling, TPL2 signaling, calcium signaling, an IFNγ response, or an IFNα response as compared to an isotype control antibody.

215. The method of any one of claims 208-214, wherein upon cell contact the antibody decreases cell cycle pathway, cell survival, cell adhesion, Myc target pathway, E2F targets pathway, hypoxia pathway, mTOR signaling pathway, PI3K-AKT signaling pathway, Src signaling pathway, PKC signaling pathway, epithelial to mesenchymal transition signaling pathway, oxidative phosphorylation, or MAPK signaling pathway as compared to an isotype control antibody.

216. The method of any one of claims 208-215, wherein upon cell contact the antibody induces inflammasome activation as determined by IL-1β and/or and IL-18 secretion and/or phagocytosis.

217. The method of any one of claims 208-216, wherein upon cell contact the antibody induces repolarization of myeloid M2-like TAMs to M1-like TAMS, and/or repolarization of mMDSCs to pro-inflammatory monocytes.

218. The method of any one of claims 208-217, wherein upon cell contact the antibody increases CD8+ T cells, CD4+ T cells, NK cells, dendritic cells, MHCII+ macrophages, $MHCII^{high}$ monocytes, or $MHCII^{mid}$ monocytes as compared to an isotype control antibody.

219. The method of any one of claims 208-218, wherein upon cell contact the antibody increases macrophages, marginal zone macrophages, follicular B cells, and/or red pulp macrophages in the spleen as compared to an isotype control antibody.

220. The method of any one of claims 208-219, wherein upon cell contact the antibody decreases TAMs, tumor associated neutrophils, plasma B cells, marginal zone B cells, CD19+ B cells, MHCII- monocytes, and/or MHCII- macrophages as compared to an isotype control antibody.

221. The method of any one of claims 194-220, wherein the subject has previously received, is concurrently receiving, or will subsequently receive an immunotherapy.

~~**222.** The method of claim 221, wherein the immunotherapy is at least one of: a checkpoint inhibitor; a checkpoint inhibitor of T cells; and an anti-PD1 antibody.The method of claim 222, wherein the immunotherapy comprises an anti-PD1 antibody.~~

~~**223.** A method of determining an expression level of MARCO protein in a sample from a subject comprising contacting the sample with an anti-MARCO antibody and performing an immunohistochemistry assay or a soluble MARCO assay.~~

~~**224.** The method of claim 223, wherein the assay is an immunohistochemistry assay and the antibody comprises RDM5, RDM9, PI-3010.15, PI-3010.25, or PI-3030.41.~~