CLAIMS

1. An isolated antibody or fragment thereof, wherein the antibody binds specifically to human IL-17A having the sequence shown in SEQ ID NO: 105 at amino acid residues 56-68 (SEQ ID NO: 157) and 100-116 (SEQ ID NO: 158); or at residues L26, R55, E57, P59, E60, R61, Y62, S64, V65, W67, R101, E102, P103 and F110.
2. An isolated antibody or fragment thereof, wherein the antibody binds specifically to a P2 pocket cavity on human IL-17A, the P2 pocket cavity comprising amino acid residues V22, V24, L26, I28, Y62, L99, R101, F110, and L112 of SEQ ID NO: 105.
3. An isolated antibody or fragment that binds specifically to human IL-17A that competes for human IL-17A binding with a monoclonal antibody comprising the heavy chain CDR 1, 2 and 3 (HCDR1, HCDR2 and HCDR3) amino acid sequences as shown in SEQ ID NOs: 25, 43 and 60, respectively, and the light chain CDR 1, 2 and 3 (LCDR1, LCDR2 and LCDR3) amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively.
4. An isolated antibody or fragment that binds specifically to human IL-17A, comprising heavy chain variable region paratope amino acid residues that interact with residues of human IL-17A having the amino acid sequence shown in SEQ ID NO: 105, comprising:
    a. a first threonine residue that interacts with R55 or E57 of human IL-17A;
    b. a glutamine residue that interacts with R55 or E57 of human IL-17A;
    c. a lysine residue that interacts with E57 of human IL-17A;
    d. a tyrosine residue that interacts with P59, E60 or R101 of human IL-17A;
    e. a phenylalanine residue that interacts with E60, R101,

E102 or P103 of human IL-17A;

f. a serine residue that interacts with E60 of human IL-17A; and

g. a second threonine residue that interacts with E60 of human IL-17A.

5. An isolated antibody or fragment that binds speficially to human IL-17A, comprising light chain variable region paratope amino acid residues that interact with residues of human IL-17A having the amino acid sequence shown in SEQ ID NO: 105, comprising:

a. a first phenylalanine residue that interacts with L26 of human IL-17A;

b. an aspartic acid residue that interacts with R55 or W67 of human IL-17A;

c. a first tyrosine residue that interacts with P59, S64 or R101 of human IL-17A;

d. a second phenylalanine residue that interacts with P59, E60, R61, Y62, R101 or F110 of human IL-17A; and

e. a second tyrosine residue that interacts with V65 of human IL-17A.

6. An isolated antibody or fragment that binds specifically to human IL-17A, comprising the heavy chain variable region paratope of claim 4 and the light chain variable region paratope of claim 5.

7. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a heavy chain variable region and a light chain variable region, wherein the antibody comprises:

a. a heavy chain variable region paratope selected from Chothia residues S51, T53, F56, Y58, Q95, L96 and T97; or

b. a light chain variable region paratope selected from Chothia residues Y32, D50, Y91, F93 and F94; or

c. a heavy chain variable region paratope selected from

Chothia residues S51, T53, F56, Y58, Q95, L96 and T97 and

d. a light chain variable region paratope selected from Chothia residues Y32, D50, Y91, F93 and F94.

8. An isolated antibody or fragment that binds specifically to human IL-17A, comprising heavy chain variable region paratope amino acid residues and light chain variable region paratope amino acid residues that interact with residues of human IL-17A having the amino acid sequence shown in SEQ ID NO: 105, comprising:

a. a tyrosine residue in the heavy chain variable region that interacts with R101 of human IL-17A;

b. a phenylalanine residue in the heavy chain variable region that interacts with R101 of human IL-17A;

c. a first phenylalanine residue in the light chain variable region that interacts with Y62 and R101 of human IL-17A;

d. a second phenylalanine residue in the light chain variable region that interacts with L26 and F110 of human IL-17A; and

e. a tyrosine residue in the light chain variable region that interacts with R101 of human IL-17A.

9. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a heavy chain variable region and a light chain variable region, wherein the antibody comprises:

a. a heavy chain variable region paratope selected from Chothia residues F56 and Y58; and

b. a light chain variable region paratope selected from Chothia residues Y91, F93 and F94.

10. An isolated antibody or fragment thereof that binds specifically to human IL-17A, comprising a heavy chain variable region (VH) and a light chain variable region (VL), wherein the antibody comprises:

a. the heavy chain complementarity determining region (CDR) 1, 2 and 3 (HCDR1, HCDR2, HCDR3) amino acid sequences as

shown in SEQ ID NOs: 23, 35 and 52, respectively, wherein the HCDR2 of SEQ ID NO: 35 is further defined as shown in Formula (I):

Xaa_1-I-I-P-W-F-G-Xaa_2-T-Xaa_3-Y-A-Q-K-F-Q-G,

(I)

wherein

Xaa_1 may be His, Met, Arg, Ser or Tyr;

Xaa_2 may be Trp, Thr or Tyr; and

Xaa_3 may be Tyr, Phe, Ser or Asp; or

b. the HCDR1, HCDR2, and HCDR3 amino acid sequences as shown in SEQ ID NOs: 23, 35 and 52, respectively, wherein the HCDR2 of SEQ ID NO: 35 is further defined as shown in Formula (I):

Xaa_1-I-I-P-W-F-G-Xaa_2-T-Xaa_3-Y-A-Q-K-F-Q-G,

(I)

wherein

Xaa_1 may be His, Met, Arg, Ser or Tyr;

Xaa_2 may be Trp, Thr or Tyr; and

Xaa_3 may be Tyr, Phe, Ser or Asp; and

the light chain complementarity determining reigon (CDR) 1, 2 and 3 (LCDR1, LCDR2, LCDR3) amino acid sequences as shown in SEQ ID NOs: 1, 4 and 7, respectively; or

c. the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 2, 5 and 11, respectively, wherein the LCDR3 of SEQ ID NO: 11 is further defined as shown in Formula (II):

Xaa_4-Q-Xaa_5-Xaa_6-Xaa_7-Xaa_8-Xaa_9-Xaa_{10},

(II)

wherein

Xaa_4 may be His or Gln;

Xaa_5 may be Phe or Gly;

Xaa_6 may be Thr, Val or Asn;

Xaa_7 may be Ile, Thr or Tyr;

Xaa_8 may be Pro or Arg;

Xaa_9 may be Ser or Pro; and

Xaa_{10} may be His, Phe or Leu; or

d. the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 2, 5 and 11, respectively, wherein the LCDR3 of SEQ ID NO: 11 is further defined as shown in Formula (II):

Xaa_4-Q-Xaa_5-Xaa_6-Xaa_7-Xaa_8-Xaa_9-Xaa_{10},

(II)

wherein

Xaa_4 may be His or Gln;

Xaa_5 may be Phe or Gly;

Xaa_6 may be Thr, Val or Asn;

Xaa_7 may be Ile, Thr or Tyr;

Xaa_8 may be Pro or Arg;

Xaa_9 may be Ser or Pro; and

Xaa_{10} may be His, Phe or Leu; and

the HCDR1, HCDR2, and HCDR3 amino acid sequences as shown in SEQ ID NOs: 24, 36 and 53, respectively; or

e. the HCDR1, HCDR2, and HCDR3 amino acid sequences as shown in SEQ ID NOs: 24, 36 and 57, respectively, wherein the HCDR3 of SEQ ID NO: 57 is further defined as shown in Formula (IV):

E-V-D-S-Xaa_{19}-Y-Y-S-Y-F-D-I,

(IV)

wherein

Xaa_{19} is Met, Ile, Leu or Thr; or

f. the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 2, 5 and 17, respectively, wherein the LCDR3 of SEQ ID NO: 17 is further defined as shown in Formula (III):

Xaa_{11}-Q-Xaa_{12}-Xaa_{13}-Xaa_{14}-Xaa_{15}-Xaa_{16}-Xaa_{17}-Xaa_{18}-T,

(III)

wherein

Xaa_{11} may be Gln or Thr;
Xaa_{12} may be Ser or Tyr;
Xaa_{13} may be Asn, Arg, Val or Tyr;
Xaa_{14} may be His or Ser;
Xaa_{15} may be Ile, Thr, Leu, Ala or Ser;
Xaa_{16} may be Pro, Leu or Ser;
Xaa_{17} may be Pro, Ser, Phe or Leu; and
Xaa_{18} may be Ala, Leu or Asp; or

g. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 24, 36 and 57, respectively, wherein the HCDR3 of SEQ ID NO: 57 is further defined as shown in Formula (IV):

$E-V-D-S-Xaa_{19}-Y-Y-S-Y-F-D-I$,

(IV)

wherein

Xaa_{19} is Met, Ile, Leu or Thr; and

the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 2, 5 and 17, respectively, wherein the LCDR3 of SEQ ID NO: 17 is further defined as shown in Formula (III):

$Xaa_{11}-Q-Xaa_{12}-Xaa_{13}-Xaa_{14}-Xaa_{15}-Xaa_{16}-Xaa_{17}-Xaa_{18}-T$,

(III)

wherein

Xaa_{11} may be Gln or Thr;
Xaa_{12} may be Ser or Tyr;
Xaa_{13} may be Asn, Arg, Val or Tyr;
Xaa_{14} may be His or Ser;
Xaa_{15} may be Ile, Thr, Leu, Ala or Ser;
Xaa_{16} may be Pro, Leu or Ser;
Xaa_{17} may be Pro, Ser, Phe or Leu; and
Xaa_{18} may be Ala, Leu or Asp; or

h. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 46 and 61, respectively, wherein the

HCDR2 of SEQ ID NO: 46 is further defined as shown in Formula (VI):

Xaa_{21}-I-Xaa_{22}-Xaa_{23}-Xaa_{24}-Xaa_{25}-Xaa_{26}-Xaa_{27}-Xaa_{28}-Xaa_{29}-Y-A-D-S-V-K-G,

(VI)

wherein

Xaa_{21} may be Ala, Gly, Thr or Val;

Xaa_{22} may be Asn or Ser;

Xaa_{23} may be Gly, Met, Lys, Ile, Leu or His;

Xaa_{24} may be Leu, Asp, Ala, His, Thr, Gly or Ser;

Xaa_{25} may be Gly or Ser;

Xaa_{26} may be Thr, Gly, Tyr or Asp;

Xaa_{27} may be His, Trp, Tyr or Phe;

Xaa_{28} may be Lys, Thr or Ile; and

Xaa_{29} may be Tyr, Phe or Asn; and

the HCDR3 of SEQ ID NO: 61 is further defined as shown in Formula (VII):

Q-L-Xaa_{30}-L-D-V,

(VII)

wherein

Xaa_{30} may be Met, Leu or Thr; or

i. the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 22, respectively, wherein the LCDR3 of SEQ ID NO: 22 is further defined as shown in Formula (V):

G-S-Y-D-F-F-L-G-Xaa_{20}-I-V,

(V)

wherein

Xaa_{20} is Met, Leu, Thr or Tyr; or

j. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 46 and 61, respectively, wherein the HCDR2 of SEQ ID NO: 46 is further defined as shown in Formula (VI):

Xaa_{21}-I-Xaa_{22}-Xaa_{23}-Xaa_{24}-Xaa_{25}-Xaa_{26}-Xaa_{27}-Xaa_{28}-Xaa_{29}-Y-A-D-S-V-K-G,

(VI)

wherein

Xaa_{21} may be Ala, Gly, Thr or Val;

Xaa_{22} may be Asn or Ser;

Xaa_{23} may be Gly, Met, Lys, Ile, Leu or His;

Xaa_{24} may be Leu, Asp, Ala, His, Thr, Gly or Ser;

Xaa_{25} may be Gly or Ser;

Xaa_{26} may be Thr, Gly, Tyr or Asp;

Xaa_{27} may be His, Trp, Tyr or Phe;

Xaa_{28} may be Lys, Thr or Ile; and

Xaa_{29} may be Tyr, Phe or Asn; and

the HCDR3 of SEQ ID NO: 61 is further defined as shown in Formula (VII):

Q-L-Xaa_{30}-L-D-V,

(VII)

wherein

Xaa_{30} may be Met, Leu or Thr; and

the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 22, respectively, wherein the LCDR3 of SEQ ID NO: 22 is further defined as shown in Formula (V):

G-S-Y-D-F-F-L-G-Xaa_{20}-I-V,

(V)

wherein

Xaa_{20} is Met, Leu, Thr or Tyr; or

k. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 51 and 58, respectively, wherein the HCDR2 of SEQ ID NO: 51 is further defined as shown in Formula (VIII):

V-T-S-Xaa_{31}-Xaa_{32}-Xaa_{33}-Xaa_{34}-T-Y-Y-A-Xaa_{35}-S-V-K-G,

(VIII)

wherein

Xaa_{31} may be Ala, Lys, Met or His;

Xaa_{32} may be Asn, Met, Thr or Arg;

Xaa_{33} may be Gly or Asp;

Xaa_{34} may be Arg, His or Asn; and

Xaa_{35} may be Asp or Gly; or

l. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 51 and 58, respectively, wherein the HCDR2 of SEQ ID NO: 51 is further defined as shown in Formula (VIII):

$V-T-S-Xaa_{31}-Xaa_{32}-Xaa_{33}-Xaa_{34}-T-Y-Y-A-Xaa_{35}-S-V-K-G$, (VIII)

wherein

Xaa_{31} may be Ala, Lys, Met or His;

Xaa_{32} may be Asn, Met, Thr or Arg;

Xaa_{33} may be Gly or Asp;

Xaa_{34} may be Arg, His or Asn; and

Xaa_{35} may be Asp or Gly; and

the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively.

11. An isolated antibody or fragment thereof that binds specifically to human IL-17A, comprising a VH and a VL region, wherein the antibody comprises the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in

a. SEQ ID NOs: 23, 26 and 52, respectively;

b. SEQ ID NOs: 23, 27 and 52, respectively;

c. SEQ ID NOs: 23, 28 and 52, respectively;

d. SEQ ID NOs: 23, 29 and 52, respectively;

e. SEQ ID NOs: 23, 30 and 52, respectively;

f. SEQ ID NOs: 23, 31 and 52, respectively;

g. SEQ ID NOs: 23, 32 and 52, respectively;

h. SEQ ID NOs: 23, 33 and 52, respectively; or

i. SEQ ID NOs: 23, 34 and 52, respectively.

12. The isolated antibody or fragment of claim 11, wherein the antibody further comprises the LCDR1, LCDR2, and LCDR3 amino

acid sequences as shown in SEQ ID NOs: 1, 4 and 7, respectively.

13. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein in the antibody comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 1, 4 and 7, respectively.

14. An isolated antibody or fragment binds specifically to human IL-17A, comprising a Vh and a VL, wherein the antibody comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 2, 5 and 8, respectively;

b. SEQ ID NOs: 2, 5 and 9, respectively; or

c. SEQ ID NOs: 2, 5 and 10, respectively.

15. The isolated antibody or fragment of claim 14, wherein the antibody further comprises the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 24, 36 and 53, respectively.

16. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 24, 36 and 53, respectively;

b. SEQ ID NOs: 24, 36 and 54, respectively;

c. SEQ ID NOs: 24, 36 and 55, respectively; or

d. SEQ ID NOs: 24, 36 and 56, respectively.

17. The isolated antibody or fragment of claim 16, wherein the antibody further comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 2, 5 and 12, respectively;

b. SEQ ID NOs: 2, 5 and 13, respectively;

c. SEQ ID NOs: 2, 5 and 14, respectively;

d. SEQ ID NOs: 2, 5 and 15, respectively; or

e. SEQ ID NOs: 2, 5 and 16, respectively.

18. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 2, 5 and 12, respectively;
b. SEQ ID NOs: 2, 5 and 13, respectively;
c. SEQ ID NOs: 2, 5 and 14, respectively;
d. SEQ ID NOs: 2, 5 and 15, respectively;
e. SEQ ID NOs: 2, 5 and 16, respectively.

19. An isolated antibody or fragment binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 25, 37 and 58, respectively;
b. SEQ ID NOs: 25, 38 and 58, respectively;
c. SEQ ID NOs: 25, 39 and 58, respectively;
d. SEQ ID NOs: 25, 40 and 58, respectively;
e. SEQ ID NOs: 25, 41 and 58, respectively;
f. SEQ ID NOs: 25, 42 and 58, respectively;
g. SEQ ID NOs: 25, 43 and 58, respectively;
h. SEQ ID NOs: 25, 41 and 59, respectively;
i. SEQ ID NOs: 25, 41 and 60, respectively;
j. SEQ ID NOs: 25, 43 and 60, respectively;
k. SEQ ID NOs: 25, 44 and 58, respectively; or
l. SEQ ID NOs: 25, 45 and 58, respectively.

20. The isolated antibody or fragment of claim 19, wherein the antibody further comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 3, 6 and 18, respectively;
b. SEQ ID NOs: 3, 6 and 19, respectively;
c. SEQ ID NOs: 3, 6 and 20, respectively; and
d. SEQ ID NOs: 3, 6 and 21, respectively.

21. An isolated antibody or fragment binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody

comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 3, 6 and 18, respectively;
b. SEQ ID NOs: 3, 6 and 19, respectively;
c. SEQ ID NOs: 3, 6 and 20, respectively; or
d. SEQ ID NOs: 3, 6 and 21, respectively.

22. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in::

a. SEQ ID NOs: 25, 47 and 58, respectively;
b. SEQ ID NOs: 25, 48 and 58, respectively;
c. SEQ ID NOs: 25, 49 and 58, respectively; or
d. SEQ ID NOs: 25, 50 and 58, respectively.

23. The isolated antibody or fragment of claim 22, wherein the antibody further comprises the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively.

24. An isolated antibody or fragment that binds specifically to human IL-17A comprising a VH and a VL, wherein the antibody comprises:

a. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 43 and 60, respectively; or
b. the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively; or
c. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 43 and 60, respectively and
the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively; or
d. the VH of SEQ ID NO: 86; or
e. the VL of SEQ ID NO: 79; or
f. the VH of SEQ ID NO: 86 and
the VL of SEQ ID NO: 79.

25. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the VH having an amino acid sequence shown in SEQ ID NOs: 67, 68, 69, 81, 82, 83, 84, 85, or 86.

26. The isolated antibody or fragment of claim 25, wherein the antibody further comprises the VL having an amino acid sequence shown in SEQ ID NOs: 76, 77, 78, 79, or 80.

27. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the VL having an amino acid sequence shown in SEQ ID NOs: 76, 77, 78, 79, or 80.

28. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the VH which is at least 90% identical to the VH having an amino acid sequence shown in SEQ ID NOs: 67, 68, 69, 81, 82, 83, 84, 85, or 86.

29. An isolated antibody or fragment that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the VL which is at least 90% identical to the variable region having an amino acid sequence shown in SEQ ID NOs: 76, 77, 78, 79, or 80.

30. An isolated antibody or fragment that binds specifically to human IL-17A, comprising an antibody heavy chain having an amino acid sequence shown in SEQ ID NOs: 92, 93, 94, 95, 96, 97, 98, 99, or 100.

31. An isolated antibody or fragment that binds specifically to IL-17A, comprising an antibody light chain having an amino acid sequence shown in SEQ ID NOs: 87, 88, 89, 90, or 91.

32. The isolated antibody or fragment of claim 3 or 7, wherein the antibody is fully human.

33. The isolated antibody or fragment of claim 3 or 7, wherein the antibody is conjugated to polyethylene glycol.

34. The isolated antibody or fragment of claim 3 or 7, having an IgG1 or IgG4 isotype.

35. The isolated antibody or fragment of claim 3 or 7, wherein the Fc domain comprises S229P, P235A or L236A mutations in the Fc domain.

36. A pharmaceutical composition comprising the isolated antibody or fragment of claim 3 or 7 and a pharmaceutically acceptable carrier.

37. An isolated antibody heavy chain comprising the amino acid sequence shown in SEQ ID NOs: 67, 68, 69, 81, 82, 83, 84, 85, 86, 92, 93, 94, 95, 96, 97, 98, 99, or 100.

38. An isolated antibody light chain comprising the amino acid sequence shown in SEQ ID NOs: 76, 77, 78, 79, 80, 87, 88, 89, 90, or 91.

39. An isolated polynucleotide encoding an antibody heavy chain comprising the amino acid sequence shown in SEQ ID NO: 67, 68, 69, 81, 82, 83, 84, 85, 86, 92, 93, 94, 95, 96, 97, 98, 99, or 100.

40. An isolated polynucleotide encoding an antibody light chain comprising the amino acid sequence shown in SEQ ID NO: 76, 77, 78, 79, 80, 87, 88, 89, 90, or 91.

41. A vector comprising at least one polynucleotide of claim 39 or 40.

42. A host cell comprising the vector of claim 40.

43. A method of inhibiting interaction of human IL-17A with IL-17RA comprising:

a. providing human IL-17A and IL-17RA; and

b. contacting human IL-17A with an antagonist that binds human IL-17A at at least one amino acid residue selected from the group consisting of V22, V24, L26, I28, Y62, L99, R101, F110, and L112.

44. A method of inhibiting IL-17A biological activity, comprising:

a. providing human IL17-A and IL-17RA; and

b. contacting human IL-17A with an antagonist that binds human IL-17A at at least one amino acid residue selected

from the group consisting of V22, V24, L26, I28, Y62, L99, R101, F110, and L112.

45. A method of claim 43 or 44, wherein the antagonist is an antibody, a peptide, or a small molecule.

46. A method of treating an inflammatory condition, comprising administering a therapeutically effective amount of the isolated antibody of claim 3 or 7 to a patient in need thereof for a time sufficient to treat the inflammatory condition.

47. The method of claim 46, wherein the inflammatory condition affects the respiratory tract, lung, the gastrointestinal tract, small intestine, large intestine, colon, rectum, joint, bone and synovial tissue, cartilage, epithelium, endothelium, hepatic tissue, or skin.

48. The method of claim 46, wherein the inflammatory condition is an inflammatory pulmonary condition, asthma, chronic obstructive pulmonary disease (COPD), an inflammatory bowel disease, an autoimmune disease, rheumatoid arthritis, psoriasis or systemic sclerosis.

CLAIMS

1. An isolated antibody or fragment thereof that binds specifically to human IL-17A, comprising a heavy chain variable region (VH) and a light chain variable region (VL), wherein the VH region comprises the HCDR1, HCDR2 and HCDR3 having the amino acid sequences as shown in SEQ ID NOs:25, 46 and 61, respectively; and the VL region comprises the LCDR1, LCDR2, and LCDR3 having the amino acid sequences as shown in SEQ ID NOs:3, 6 and 22, respectively; and wherein

in SEQ ID NO:46,

Xaa1 may be Ala, Gly, Thr or Val;

Xaa3 may be Asn or Ser;

Xaa4 may be Gly, Met, Lys, Ile, Leu or His;

Xaa5 may be Leu, Asp, Ala, His, Thr, Gly or Ser;

Xaa6 may be Gly or Ser;

Xaa7 may be Thr, Gly, Tyr or Asp;

Xaa8 may be His, Trp, Tyr or Phe;

Xaa9 may be Lys, Thr or Ile; and

Xaa10 may be Tyr, Phe or Asn;

in SEQ ID NO:61,

Xaa may be Met, Leu or Thr; and

in SEQ ID NO:22,

Xaa is Met, Leu, Thr or Tyr.

2. The isolated antibody or fragment of claim 1, wherein the antibody comprises the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in:

a. SEQ ID NOs: 25, 37 and 58, respectively;
b. SEQ ID NOs: 25, 38 and 58, respectively;
c. SEQ ID NOs: 25, 39 and 58, respectively;
d. SEQ ID NOs: 25, 40 and 58, respectively;
e. SEQ ID NOs: 25, 41 and 58, respectively;
f. SEQ ID NOs: 25, 42 and 58, respectively;
g. SEQ ID NOs: 25, 43 and 58, respectively;
h. SEQ ID NOs: 25, 41 and 59, respectively;
i. SEQ ID NOs: 25, 41 and 60, respectively;
j. SEQ ID NOs: 25, 43 and 60, respectively;
k. SEQ ID NOs: 25, 44 and 58, respectively; or
l. SEQ ID NOs: 25, 45 and 58, respectively; and

the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in:

m. SEQ ID NOs: 3, 6 and 18, respectively;
n. SEQ ID NOs: 3, 6 and 19, respectively;

o. SEQ ID NOs: 3, 6 and 20, respectively; or
p. SEQ ID NOs: 3, 6 and 21, respectively.

3. An isolated monoclonal antibody or fragment thereof that binds specifically to human IL-17A that competes for human IL-17A binding with a monoclonal antibody comprising the heavy chain CDR 1, 2 and 3 (HCDR1, HCDR2 and HCDR3) amino acid sequences as shown in SEQ ID NOs: 25, 43 and 60, respectively, and the light chain CDR 1, 2 and 3 (LCDR1, LCDR2 and LCDR3) amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively.

4. The isolated antibody or fragment of claim 3 or 1, wherein the antibody is fully human.

5. The isolated antibody or fragment of claim 3 or 1, wherein the antibody is conjugated to polyethylene glycol.

6. The isolated antibody or fragment of claim 3 or 1, having an IgG1 or IgG4 isotype.

7. The isolated antibody or fragment of claim 3 or 1, wherein the Fc domain comprises S229P, P235A or L236A mutations in the Fc domain.

8. A pharmaceutical composition comprising the isolated antibody or fragment of claim **3** or **1** and a pharmaceutically acceptable carrier.

9. An isolated antibody or fragment thereof that binds specifically to human IL-17A comprising a VH and a VL, wherein the antibody comprises:

a. the HCDR1, HCDR2 and HCDR3 amino acid sequences as shown in SEQ ID NOs: 25, 43 and 60, respectively and
the LCDR1, LCDR2, and LCDR3 amino acid sequences as shown in SEQ ID NOs: 3, 6 and 18, respectively; or

b. the VH of SEQ ID NO: 86; or

c. the VL of SEQ ID NO: 79; or

d. the VH of SEQ ID NO: 86 and the VL of SEQ ID NO: 79.

10. An isolated antibody or fragment thereof that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the VH having the amino acid sequence shown in SEQ ID NO: 86.

11. The isolated antibody or fragment of claim **10**, wherein the antibody comprises the VL having the amino acid sequence shown in SEQ ID NO: 79.

12. An isolated antibody or fragment thereof that binds specifically to human IL-17A, comprising a VH and a VL, wherein the antibody comprises the VL having the amino acid sequence shown in SEQ ID NO: 79.