CLAIMS

1. A monoclonal anti-human CCL20 antibody or an antigen-binding portion thereof, whose heavy chain complementarity determining region 1 (CDR1), complementarity determining region 2 (CDR2), and complementarity determining region 3 (CDR3) and whose light chain CDR1, CDR2, and CDR3 comprise amino acid sequences selected from the group consisting of:

a) the amino acid sequences shown in SEQ ID NOS: 60, 64, 67, 70, 73, and 75, respectively;

b) the amino acid sequences shown in SEQ ID NOS: 60, 64, 67, 71, 73, and 75, respectively;

c) the amino acid sequences shown in SEQ ID NOS: 77, 79, 67, 70, 73, and 75, respectively; and

d) the amino acid sequences shown in SEQ ID NOS: 77, 79, 67, 71, 73, and 75, respectively.

2. The antibody or antigen-binding portion of claim 1, wherein said antibody heavy chain variable domain comprises the amino acid sequence of SEQ ID NO: 9.

3. The antibody or antigen-binding portion according to claim 2, wherein said antibody light chain variable domain comprises the amino acid sequence shown in SEQ ID NO: 15 or SEQ ID NO: 16.

4. The monoclonal anti-human CCL20 antibody of claim 1, wherein:

a) said heavy chain comprises the amino acid sequence of SEQ ID NO: 1 without the signal sequence;

b) said heavy chain comprises the amino acid sequence of SEQ ID NO: 1 without the signal sequence, wherein said amino acid sequence lacks the C-terminal lysine; or

c) said light chain comprises an amino acid sequence selected from the group consisting of: the amino acid sequence of SEQ ID NO: 7 without the signal sequence and the amino acid sequence of SEQ ID NO: 8 without the signal sequence.

5. The antibody according to claim 4, wherein said heavy chain and said light chain comprise amino acid sequences selected from the group consisting of:

a) SEQ ID NO: 1 and SEQ ID NO: 7, respectively;

b) SEQ ID NO: 1 and SEQ ID NO: 8, respectively;

c) SEQ ID NO: 1 without the signal sequence and SEQ ID NO: 7 without the signal sequence, respectively;
d) SEQ ID NO: 1 without the signal sequence and SEQ ID NO: 8 without the signal sequence, respectively;
e) SEQ ID NO: 1 without the signal sequence and lacking the C-terminal lysine and SEQ ID NO: 7 without the signal sequence, respectively; and
f) SEQ ID NO: 1 without the signal sequence and lacking the C-terminal lysine and SEQ ID NO: 8 without the signal sequence, respectively.

6. The monoclonal antibody or antigen-binding portion of claim 1, wherein the antibody is a humanized antibody.

7. The monoclonal antibody or antigen-binding portion of claim 1, wherein the framework regions of said heavy chain utilize a IGHV1-46*03 human germline sequence, and wherein the framework regions of said light chain utilize a IGKV1D-39*01 human germline sequence.

8. The monoclonal antibody of any one of claims 1, 2, and 3, wherein said antibody comprises a human IgG1, IgG2, IgG3, or IgG4 constant domain.

9. The antigen-binding portion of claim 1, wherein said antigen-binding portion is a single chain antibody, Fv, Fab, Fab', F(ab').sub.2, Fd, single chain Fv molecule (scFv), bispecific single chain Fv dimer, diabody, domain-deleted antibody or single domain antibody (dAb).

10. The monoclonal antibody or antigen-binding portion of claim 1, wherein said antibody or antigen-binding portion has one or more properties selected from the group consisting of:
a) does not bind to human CCL16;

b) binds to cynomolgus or rhesus CCL20, but not to mouse or rat CCL20;
c) has a binding affinity for human CCL20 of 70 pM or less using a monovalent surface plasmon resonance assay;
d) has a binding affinity for human CCL20 of 12 pM or less using a bivalent surface plasmon resonance assay;
e) has a binding affinity for human CCL20 greater than that of human CCR6;
f) has a selectivity for human CCL20 over human CX3CL1, CXCL1, CXCL2, CXCL4,

CXCL8, CXCL9, CXCL10, CXCL12, CXCL13, CXCL16, CCL1, CCL2, CCL3, CCL4, CCL5, CCL7, CCL11, CCL13, CCL16, CCL17, CCL19, CCL21, CCL22, CCL24, CCL25, CCL27, CCL28, or XCL1;

g) reduces human CCL20-induced chemotaxis of CCR6+ cells with an IC.sub.50 of 1.7 nM or less;

h) reduces human CCL20-induced chemotaxis of CCR6+ cells in vivo;

i) reduces human CCL20-induced chemotaxis of CCR6+ cells in vitro;

j) reduces progression of arthritis symptoms in a subject;

k) reduces osteoporosis, bone erosion, or new bone formation in a subject;

l) reduces cartilage oligomeric matrix protein (COMP) serum levels in a subject;

m) reduces mRNA levels of RANKL, RANK, TRAP, or cathepsin K in a subject;

n) reduces progression of atopic dermatitis in a subject; and

o) reduces progression of allergic contact dermatitis in a subject.

11. The monoclonal antibody or antigen-binding portion according to claim 1 that binds to an epitope of human CCL20 comprising one or more amino acid sequences selected from the group consisting of:

a) residues 7-9 of SEQ ID NO: 84;

b) residues 10-19 of SEQ ID NO: 84; and

c) residues 20-22 of SEQ ID NO: 84.

12. The monoclonal antibody or antigen-binding portion of claim 11, wherein said epitope is selected from the group consisting of an epitope that comprises residues 7-9, 10-19, and 20-22 of SEQ ID NO: 84, and an epitope that comprises residues 7-9, 10-19, and 20-22 of SEQ ID NO: 84 and further comprises one or more amino acid sequences selected from the group consisting of:

a) residues 39-55 of SEQ ID NO: 84;

b) residues 56-67 of SEQ ID NO: 84; and

c) residues 61-70 of SEQ ID NO: 84.

13. The monoclonal antibody or antigen-binding portion of claim 12, wherein said epitope comprises residues 7-9, 10-19, 20-22, 39-55, 56-67, and 61-70 of SEQ ID NO: 84.

14. A monoclonal antibody whose heavy chain and light chain comprise amino acid sequences selected from the group consisting of:
a) SEQ ID NO: 108 and SEQ ID NO: 110, respectively; and
b) SEQ ID NO: 108 without the C-terminal lysine and SEQ ID NO: 110, respectively.

15. A monoclonal antibody whose heavy chain and light chain comprise the amino acid sequences of:
a) SEQ ID NO: 108 and SEQ ID NO: 112, respectively; or
b) SEQ ID NO: 108 without the C-terminal lysine and SEQ ID NO: 112, respectively.

16. A monoclonal antibody whose heavy chain and light chain-comprise the amino acid sequences of SEQ ID NO: 1 without the signal sequence and SEQ ID NO: 7 without the signal sequence, respectively.

17. A monoclonal antibody whose heavy chain and light chain comprise the amino acid sequences of SEQ ID NO: 1 without the signal sequence and lacking the C-terminal lysine and SEQ ID NO: 7 without the signal sequence, respectively.

18. A monoclonal antibody whose heavy chain and light chain-comprise the amino acid sequences of SEQ ID NO: 1 without the signal sequence and SEQ ID NO: 8 without the signal sequence, respectively.

19. A monoclonal antibody whose heavy chain and light chain comprise the amino acid sequences of SEQ ID NO: 1 without the signal sequence and lacking the C-terminal lysine and SEQ ID NO: 8 without the signal sequence, respectively.

20. A composition comprising the monoclonal antibody or antigen-binding portion of any one of claims 14, 15, 11, and 16-19 and a pharmaceutically acceptable vehicle or carrier.

21. A method for reducing CCL20-mediated chemotaxis of CCR6+ cells in vitro, using the antibody or antigen-binding portion of any one of claims 14, 15, 11, and 16-19.

22. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for treating a condition selected from the group consisting of rheumatoid arthritis, atopic dermatitis, contact dermatitis, osteoporosis, dermatitis-associated erythema,

dermatitis-associated swelling, arthritis-associated swelling, and allergic contact dermatitis.

23. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for reducing CCL20-mediated chemotaxis of CCR6+cells in a subject.

24. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for decreasing cartilage oligomeric matrix protein (COMP) serum levels in an arthritis patient.

25. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for decreasing mRNA levels of receptor activator for nuclear factor icB ligand (RANKL) in joint tissue of an arthritis patient.

26. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for decreasing mRNA levels of receptor activator for nuclear factor KB (RANK) in joint tissue of an arthritis patient.

27. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for decreasing mRNA levels of tartrate resistant acid phosphatase (TRAP) in joint tissue of an arthritis patient.

28. Use of an antibody or antigen-binding portion of any one of claims 1-19 in the manufacture of a medicament for decreasing mRNA levels of cathepsin K in joint tissue of an arthritis patient.

29. The antibody or antigen-binding portion of any one of claims 1-19 for use in treating a condition selected from the group consisting of rheumatoid arthritis, atopic dermatitis, contact dermatitis, osteoporosis, dermatitis-associated erythema, dermatitis-associated swelling, arthritis-associated swelling, and allergic contact dermatitis.

30. The antibody or antigen-binding portion of any one of claims 1-19 for use in reducing CCL20-mediated chemotaxis of CCR6+cells in a subject.

31. The antibody or antigen-binding portion of any one of claims 1-19 for use in decreasing cartilage oligomeric matrix protein (COMP) serum levels in an arthritis patient.

32. The antibody or antigen-binding portion of any one of claims 1-19 for use in decreasing mRNA levels of receptor activator for nuclear factor icB ligand (RANKL) in joint tissue of an arthritis patient.

33. The antibody or antigen-binding portion of any one of claims 1-19 for use in decreasing mRNA levels of receptor activator for nuclear factor KB (RANK) in joint tissue of an arthritis patient.

34. The antibody or antigen-binding portion of any one of claims 1-19 for use in decreasing mRNA levels of tartrate resistant acid phosphatase (TRAP) in joint tissue of an arthritis patient.

35. The antibody or antigen-binding portion of any one of claims 1-19 for use in decreasing mRNA levels of cathepsin K in joint tissue of an arthritis patient.