

CLAIMS

1. An isolated anti-IL-23 receptor (IL-23R) antibody or antigen-binding fragment thereof, wherein

the heavy chain variable region (VH) of the antibody or fragment comprises complementary-determining regions (HCDRs) 1-3 comprising SEQ ID NOs: 1-3, respectively; or any HCDR having an amino acid sequence that shares at least about 90% of identity with one of SEQ ID NOs: 1-3; and

the light chain variable region (VL) of the antibody or fragment comprises complementary-determining regions (LCDRs) 1-3 comprising SEQ ID NOs: 4-6, respectively; or any LCDR having an amino acid sequence that shares at least about 90% of identity with one of SEQ ID NOs: 4-6.

2. An isolated anti-IL-23 receptor (IL-23R) antibody or antigen-binding fragment thereof, wherein

the heavy chain variable region (VH) of the antibody or fragment comprises complementary-determining regions (HCDRs) 1-3 comprising SEQ ID NOs: 1-3, respectively; and

the light chain variable region (VL) of the antibody or fragment comprises complementary-determining regions (LCDRs) 1-3 comprising SEQ ID NOs: 4-6, respectively.

3. The isolated anti-IL-23R antibody or antigen-binding fragment thereof according to claim **1**, wherein said antibody or antigen-binding fragment is capable of binding mouse and human IL-23R.

4. The isolated anti-IL-23R antibody or antigen-binding fragment thereof according to claim **1** or **3**, wherein said antibody or antigen-binding fragment is capable of binding to a human IL-23R alpha subunit with an EC₅₀ of less than 40 nM or less than 60 nM.

5. The isolated anti-IL-23R antibody or antigen-binding fragment thereof according to any one of claims **1** to **5**, wherein

said VH comprises SEQ ID NO: 7 or an amino acid sequence at least about 90% identical thereto, and

said VL comprises SEQ ID NO: 8 or any amino acid sequence at least about 90% of identical thereto.

6. The isolated anti-IL-23R antibody or antigen-binding fragment thereof according to claim **6**, wherein

said VH comprises SEQ ID NO: 7, and

said VL comprises SEQ ID NO: 8.

7. The isolated anti-IL-23R antibody or antigen-binding fragment thereof according to any one of claims **1** to **6**, wherein said antibody or antigen-binding fragment is an scFv comprising SEQ ID NO: 15 or any amino acid sequence at least about 95% identical thereto.

8. The isolated anti-IL-23R antibody or antigen-binding fragment thereof according to claim **7**, wherein said antibody or antigen-binding fragment is an scFv comprising SEQ ID NO: 15.

9. A chimeric antigen receptor (CAR) comprising:

(i) an extracellular domain comprising an anti-IL-23R antibody or antigen-binding fragment thereof according to any one of claims **1** to **8**;

(ii) a transmembrane domain;

(iii) a cytoplasmic domain comprising an intracellular signaling domain; and

(iv) optionally further comprising a leader sequence.

10. The CAR according to claim **9**, wherein the extracellular domain comprises an scFv comprising SEQ ID NO: 15.

11. The CAR according to claim **9** or **10**, wherein the intracellular signaling domain comprises

a human CD28 costimulatory signaling domain, optionally comprising SEQ ID NO: 32 or an amino acid sequence at least about 90% identical thereto, and/or

a human CD3 zeta domain, optionally comprising SEQ ID NO: 30 or an amino acid sequence at least about 90% identical thereto.

12. The CAR according to any one of claims **9** to **11**, wherein the transmembrane domain is derived from human CD8, optionally comprising SEQ ID NO: 22 or an amino acid sequence at least about 90% identical thereto.

13. The CAR according to any one of claims **9** to **12**, wherein the leader sequence comprises (i) an amino acid sequence derived from a CD8 leader sequence, optionally comprising SEQ ID NO: 40 or an amino acid sequence at least about 95% (e.g., about 96%, 97%, 98%, or 99%) identical thereto, or (ii) an amino acid sequence derived from a CD25 leader sequence, optionally comprising SEQ ID NO: 58 or an amino acid sequence at least about 95% (e.g., about 96%, 97%, 98%, or 99%) identical thereto.

14. A chimeric antigen receptor (CAR) comprising:

(i) an anti-IL-23R scFv, optionally comprising SEQ ID NO: 15,
(ii) a hinge domain derived from human CD8, optionally comprising SEQ ID NO: 20,
(iii) a transmembrane domain derived from human CD8, optionally comprising SEQ ID NO: 22,

(iv) an intracellular signaling domain comprising a human CD28 costimulatory signaling domain, optionally comprising SEQ ID NO: 32, and a human CD3 zeta domain, optionally comprising SEQ ID NO: 30, and

(v) optionally a tag and/or a leader sequence, wherein the leader sequence is derived from CD8, optionally wherein the CD8 leader sequence comprises SEQ ID NO: 40 or wherein the leader sequence is wherein the leader sequence is derived from CD8, optionally wherein the CD25 leader sequence comprises SEQ ID NO: 58.

15. A nucleic acid molecule encoding the antibody or antigen-binding fragment according to any one of claims **1 to 8**, or the CAR according to any one of claims **9 to 14**, optionally wherein the nucleic acid molecule is a vector.

16. A cell or immune cell expressing the CAR according to any one of claims **9 to 14**, or comprising the nucleic acid molecule according to claim **15**.

17. A composition comprising the immune cell according to claim **16** or the cell or immune cell according to claim **16**.

18. A cell or immune cell according to claim **16**, a population of cells or immune cells according to claim **16**, for use as a medicament.

19. An immune cell according to claim **16**, a population of immune cells according to claim **16**, for use in treating a disease or disorder mediated by IL-23R-expressing cells in a subject in need thereof, optionally wherein said disease or disorder is an autoimmune or inflammatory disease or disorder.

20. The immune cell or cell for use according to claim **19**, wherein said disease or disorder is selected from the group consisting of inflammatory bowel diseases (optionally Crohn's disease or ulcerative colitis), lupus (optionally systemic lupus erythematosus), arthritis (optionally rheumatoid arthritis or juvenile idiopathic arthritis), Sjogren's syndrome, systemic sclerosis, multiple sclerosis, ankylosing spondylitis, type 1 diabetes, autoimmune thyroid disorders, myasthenia gravis, psoriasis, psoriatic arthritis, skin diseases and uveitis, further optionally wherein the disease is Crohn's disease.