CLAIMS

[Claim 1]

An antibody against human CX3CR1, wherein

the amino acid sequences of heavy chain variable region (VH) complementarity determining region (CDR) 1 (CDR-H1), CDR2 (CDR-H2) and CDR3 (CDR-H3) consist of:

the amino acid sequences shown in SEQ ID NOs: 2, 3 and 4, respectively, and

the amino acid sequences of light chain variable region (VL) CDR1 (CDR-L1), CDR2 (CDR-L2) and CDR3 (CDR-L3) consist of:

the amino acid sequences shown in SEQ ID NOs: 6, 7 and 8, respectively; or

the amino acid sequences shown in SEQ ID NOs: 10, 7 and 8, respectively.

[Claim 2]

The antibody according to claim 1, wherein

(a) the amino acid sequences of CDR-H1, CDR-H2 and CDR-H3 consist of the amino acid sequences shown in SEQ ID NOs: 2, 3 and 4, respectively, and

the amino acid sequences of CDR-L1, CDR-L2 and CDR-L3 consist of the amino acid sequences shown in SEQ ID NOs: 6, 7 and 8, respectively, or

(b) the amino acid sequences of CDR-H1, CDR-H2 and CDR-H3 consist of the amino acid sequences shown in SEQ ID NOs: 2, 3 and 4, respectively, and

the amino acid sequences of CDR-L1, CDR-L2 and CDR-L3 consist of the amino acid sequences shown in SEQ ID NOs: 10, 7 and 8, respectively.

[Claim 3]

An antibody against human CX3CR1, wherein

the amino acid sequence of the heavy chain variable region (VH) consists of the amino acid sequence shown in SEQ ID NO: 1, 11, 12, 13 or 14, and

the amino acid sequence of the light chain variable region (VL) consists of the amino acid sequence shown in SEQ ID NO: 5, 9 or 15.

[Claim 4]

The antibody according to claim 3, wherein

(a) the amino acid sequence of VH consists of the amino acid sequence shown in SEQ ID NO: 1, and

the amino acid sequence of VL consists of the amino acid sequence shown in SEQ ID NO: 5,

(b) the amino acid sequence of VH consists of the amino acid sequence shown in SEQ ID NO: 1, and

the amino acid sequence of VL consists of the amino acid sequence shown in SEQ ID NO: 9,

(c) the amino acid sequence of VH consists of the amino acid sequence shown in SEQ ID NO: 11, and

the amino acid sequence of VL consists of the amino acid sequence shown in SEQ ID NO: 15,

(d) the amino acid sequence of VH consists of the amino acid sequence shown in SEQ ID NO: 12, and

the amino acid sequence of VL consists of the amino acid sequence shown in SEQ ID NO: 15,

(e) the amino acid sequence of VH consists of the amino acid sequence shown in SEQ ID NO: 13, and

the amino acid sequence of VL consists of the amino acid sequence shown in SEQ ID NO: 15, or

(f) the amino acid sequence of VH consists of the amino acid sequence shown in SEQ ID NO: 14, and

the amino acid sequence of VL consists of the amino acid sequence shown in SEQ ID NO: 15.

[Claim 5]

The antibody according to any one of claims 1 to 4, wherein the antibody is a humanized antibody.

[Claim 6]

The antibody according to any one of claims 1 to 4, which has inhibitory or suppressive activity against the interaction or binding between human CX3CR1 and human CX3CL1 (fractalkine).

[Claim 7]

The antibody according to any one of claims 1 to 4, which has inhibitory or suppressive activity against the function of Eomes-expressing Th cells.

[Claim 8]

The antibody according to claim 7, which has inhibitory or suppressive activity against the infiltration of Eomes-expressing Th cells into the CNS.

[Claim 9]

The antibody according to any one of claims 1 to 4, which has the function of improving experimental autoimmune encephalomyelitis (EAE) pathology or suppressing the progression of EAE pathology.

[Claim 10]

The antibody according to any one of claims 1 to 4, for use in the prevention, suppression of progression, or treatment of, or for use in the diagnosis of a progressive immune-mediated demyelinating disease, preferably a progressive immune-mediated demyelinating disease of the central nervous system; an autoimmune disease, preferably rheumatoid arthritis, inflammatory bowel disease, Crohn's disease, systemic

scleroderma, systemic lupus erythematosus, or autoimmune myositis; a heart disease including atherosclerosis; a chronic renal disease; a diabetic heart disease; a diabetic renal disease; an interstitial lung disease; a cancer, preferably breast cancer, prostate cancer, or colorectal cancer; a COVID-19-related central nervous system disease; or a neurodegenerative disease, preferably ALS, Alzheimer's disease, or multiple system atrophy.

[Claim 11]

The antibody for use according to claim 10, wherein the progressive immune-mediated demyelinating disease is secondary progressive multiple sclerosis (SPMS).

[Claim 12]

An antibody fragment derived from the antibody according to any one of claims 1 to 4.

[Claim 13]

A pharmaceutical composition comprising the antibody according to any one of claims 1 to 4 or the antibody fragment according to claim 12.

[Claim 14]

The pharmaceutical composition according to claim 13, for use in inhibiting or suppressing the interaction or binding between human CX3CR1 and human CX3CL1 (fractalkine).

[Claim 15]

The pharmaceutical composition according to claim 13, for use in inhibiting or suppressing the function of Eomes-expressing Th cells.

[Claim 16]

The pharmaceutical composition according to claim 15, for use in inhibiting or suppressing the infiltration of Eomes-expressing Th cells into the CNS.

[Claim 17]

The pharmaceutical composition according to claim 13, for use in improving experimental autoimmune encephalomyelitis (EAE) pathology or suppressing the progression of EAE pathology.

[Claim 18]

Use of an antibody according to any one of claims 1 to 5 or the antibody fragment according to claim 12 in the preparation of a pharmaceutical composition for the prevention, suppression of progression, or treatment of a progressive immune-mediated demyelinating disease, preferably a progressive immune-mediated demyelinating disease of the central nervous system; an autoimmune disease, preferably rheumatoid arthritis, inflammatory bowel disease, Crohn's disease, systemic scleroderma, systemic lupus erythematosus, or autoimmune myositis; a heart disease including atherosclerosis; a chronic renal disease; a diabetic heart disease; a diabetic renal disease; an interstitial lung disease; a cancer, preferably breast cancer, prostate

cancer, or colorectal cancer; a COVID-19-related central nervous system disease; or a neurodegenerative disease, preferably ALS, Alzheimer's disease, or multiple system atrophy.

[Claim 19]

The use according to claim 18, wherein the progressive immune-mediated demyelinating disease is secondary progressive multiple sclerosis (SPMS).

[Claim 20]

Use of an antibody according to any one of claims 1 to 5 or the antibody fragment according to claim 12 in the preparation of a pharmaceutical composition for inhibiting or suppressing the interaction or binding between human CX3CR1 and human CX3CL1 (fractalkine).

[Claim 21]

Use of an antibody according to any one of claims 1 to 5 or the antibody fragment according to claim 12 in the preparation of a pharmaceutical composition for inhibiting or suppressing the function of Eomes-expressing Th cells.

[Claim 22]

Use according to claim 21, for inhibiting or suppressing the infiltration of Eomes-expressing Th cells into the CNS.

[Claim 23]

Use of an antibody according to any one of claims 1 to 5 in the preparation of a pharmaceutical composition for improving experimental autoimmune encephalomyelitis (EAE) pathology or suppressing the progression of EAE pathology.