

Claims

1. An isolated anti-FcRn antibody or an antigen binding
fragment thereof comprising one or more heavy chain
variable regions and light chain variable regions selected
5 from the group consisting of:

heavy chain variable region comprising CDR1 comprising
amino acid sequence of SEQ ID No: 27, CDR2 comprising amino
acid sequence of SEQ ID No: 28 and CDR3 comprising amino
acid sequence of SEQ ID No: 29, and light chain variable
10 region comprising CDR1 comprising amino acid sequence of
SEQ ID No: 30, CDR2 comprising amino acid sequence of SEQ
ID No: 31 and CDR3 comprising amino acid sequence of SEQ ID
No: 32;

heavy chain variable region comprising CDR1 comprising
15 amino acid sequence of SEQ ID No: 21, CDR2 comprising amino
acid sequence of SEQ ID No: 22 and CDR3 comprising amino
acid sequence of SEQ ID No: 23, and light chain variable
region comprising CDR1 comprising amino acid sequence of
SEQ ID No: 24, CDR2 comprising amino acid sequence of SEQ
20 ID No: 25 and CDR3 comprising amino acid sequence of SEQ ID
No: 26;

heavy chain variable region comprising CDR1 comprising
amino acid sequence of SEQ ID No: 33, CDR2 comprising amino
acid sequence of SEQ ID No: 34 and CDR3 comprising amino
25 acid sequence of SEQ ID No: 35, and light chain variable

region comprising CDR1 comprising amino acid sequence of SEQ ID No: 36, CDR2 comprising amino acid sequence of SEQ ID No: 37 and CDR3 comprising amino acid sequence of SEQ ID No: 38; and

5 heavy chain variable region comprising CDR1 comprising amino acid sequence of SEQ ID No: 39, CDR2 comprising amino acid sequence of SEQ ID No: 40 and CDR3 comprising amino acid sequence of SEQ ID No: 41, and light chain variable region comprising CDR1 comprising amino acid sequence of
10 SEQ ID No: 42, CDR2 comprising amino acid sequence of SEQ ID No: 43 and CDR3 comprising amino acid sequence of SEQ ID No: 44.

2. An isolated anti-FcRn antibody or an antigen binding
15 fragment thereof comprising:

heavy chain variable region comprising CDR1 comprising amino acid sequence of SEQ ID No: 27, CDR2 comprising amino acid sequence of SEQ ID No: 28 and CDR3 comprising amino acid sequence of SEQ ID No: 29, and light chain variable
20 region comprising CDR1 comprising amino acid sequence of SEQ ID No: 30, CDR2 comprising amino acid sequence of SEQ ID No: 31 and CDR3 comprising amino acid sequence of SEQ ID No: 32.

25 3. An isolated anti-FcRn antibody or an antigen binding

fragment thereof comprising:

heavy chain variable region comprising CDR1 comprising amino acid sequence of SEQ ID No: 21, CDR2 comprising amino acid sequence of SEQ ID No: 22 and CDR3 comprising amino acid sequence of SEQ ID No: 23, and light chain variable region comprising CDR1 comprising amino acid sequence of SEQ ID No: 24, CDR2 comprising amino acid sequence of SEQ ID No: 25 and CDR3 comprising amino acid sequence of SEQ ID No: 26.

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4. An isolated anti-FcRn antibody or an antigen binding fragment thereof comprising one or more heavy chain variable regions and light chain variable regions selected from the group consisting of:

15 heavy chain variable region comprising amino acid sequence of SEQ ID No: 4 and light chain variable region comprising amino acid sequence of SEQ ID No: 14;

heavy chain variable region comprising amino acid sequence of SEQ ID No: 6 and light chain variable region comprising

20 amino acid sequence of SEQ ID No: 16;

heavy chain variable region comprising amino acid sequence of SEQ ID No: 2 and light chain variable region comprising amino acid sequence of SEQ ID No: 12;

heavy chain variable region comprising amino acid sequence of SEQ ID No: 8 and light chain variable region comprising

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amino acid sequence of SEQ ID No: 18; and
heavy chain variable region comprising amino acid sequence
of SEQ ID No: 10 and light chain variable region comprising
amino acid sequence of SEQ ID No: 20.

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5. An isolated anti-FcRn antibody or an antigen binding
fragment thereof comprising:

heavy chain variable region comprising amino acid sequence
of SEQ ID No: 4 and light chain variable region comprising
10 amino acid sequence of SEQ ID No: 14.

6. An isolated anti-FcRn antibody or an antigen binding
fragment thereof comprising:

heavy chain variable region comprising amino acid sequence
15 of SEQ ID No: 6 and light chain variable region comprising
amino acid sequence of SEQ ID No: 16.

7. An isolated anti-FcRn antibody or an antigen binding
fragment thereof comprising:

20 heavy chain variable region comprising amino acid sequence
of SEQ ID No: 2 and light chain variable region comprising
amino acid sequence of SEQ ID No: 12.

8. The antibody or the antigen binding fragment thereof
25 according to any one of claims 1 to 7, wherein the

antibody binds FcRn with a KD(dissociation constant) value of 0.01 to 2 nM, at pH 6.0 or pH 7.4 condition.

9. The antibody or the fragment thereof according to any
5 one of claims 1 to 8, wherein the antibody or fragment thereof comprises full-length antibodies, Fab, F(ab')₂, Fv, scFv, dual-specific antibodies, minibodies, bispecific antibodies, trispecific antibodies, multispecific antibodies, diabodies, triabodies, tetrabodies, intrabodies
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10. The antibody or the antigen binding fragment thereof according to any one of claims 1 to 8, wherein the antibody comprises IgD antibodies, IgE antibodies, IgM
15 antibodies, IgG1 antibodies, IgG2 antibodies, IgG3 antibodies, IgG4 antibodies.

11. A Polynucleotide encoding the antibody or antigen binding fragment thereof according to any one of claims 1
20 to 10.

12. A polynucleotide encoding an anti-FcRn antibody or an antigen binding fragment thereof comprising a sequence encoding a heavy chain variable region and a light chain
25 variable region selected from the group consisting of:

a sequence encoding a heavy chain variable region of SEQ ID No: 3 and a sequence encoding a light chain variable region of SEQ ID No: 13;

5 a sequence encoding a heavy chain variable region of SEQ ID No: 5 and a sequence encoding a light chain variable region of SEQ ID No: 15;

a sequence encoding a heavy chain variable region of SEQ ID No: 1 and a sequence encoding a light chain variable region of SEQ ID No: 11;

10 a sequence encoding a heavy chain variable region of SEQ ID No: 7 and a sequence encoding a light chain variable region of SEQ ID No: 17; and

a sequence encoding a heavy chain variable region of SEQ ID No: 9 and a sequence encoding a light chain variable region
15 of SEQ ID No: 19.

13. A recombinant expression vector comprising the polynucleotide according to any one of claim 11 or 12.

20 14. A host cell, which is transfected with the recombinant expression vector of claim 13.

15. A method of preparing an anti-FcRn antibody or an antigen binding fragment thereof comprising:

25 culturing the host cell of claim 14 and producing the

antibody therefrom; and

isolating and purifying the produced antibody to recover the antibody binding specifically to FcRn.

5 16. A pharmaceutical composition comprising the antibody or the antigen binding fragment thereof according to any one of claims 1 to 10, and one or more pharmaceutically acceptable carrier.

10 17. Use of the pharmaceutical composition of claim 16 in the manufacture of a medicament for treating a patient suffering from an autoimmune disease.

18. The use of claim 17, wherein the autoimmune disease is
15 one selected from the group consisting of immune neutropenia, Guillain-Barré syndrome, epilepsy, autoimmune encephalitis, Isaac's syndrome, nevus syndrome, pemphigus vulgaris, Pemphigus foliaceus, Bullous pemphigoid, epidermolysis bullosa acquisita, pemphigoid gestationis,
20 mucous membrane pemphigoid, antiphospholipid syndrome, autoimmune anemia, autoimmune Grave's disease, Goodpasture's syndrome, myasthenia gravis, multiple sclerosis, rheumatoid arthritis, lupus, idiopathic thrombocytopenic purpura, lupus nephritis and membranous
25 nephropathy.

19. A composition comprising the antibody or the antigen binding fragment thereof according to any one of claims 1 to 10 labelled with a detection label.

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20. A method of detecting FcRn in vitro comprising using the antibody or the antigen binding fragment thereof according to any one of claims 1 to 10.