Claims

1. A humanized antibody that binds to human interleukin-22 receptor alpha (IL-22RA) wherein said humanized anti-body~~which~~ comprises:
   a) a heavy chain variable domain comprising H-CDR1, H-CDR2, and H-CDR3, said H-CDR1, H-CDR2, and H-CDR3 consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and
   b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2, and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 6, respectively, or consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 7, respectively.
2. The humanized antibody according to claim 1, wherein:
   a) said heavy chain variable domain comprises framework regions H-FR1, H-FR2, H-FR3 and H-FR4, said frame-work regions consisting of amino acid sequences of SEQ ID NOs: 8, 9, 10 and 11, respectively; and
   b) said light chain variable domain comprises framework regions L-FR1, L-FR2, L-FR3 and L-FR4, said framework regions consisting of amino acid sequences of SEQ ID NOs: 12, 13, 14, and 15, respectively.
3. The humanized antibody according to claim 1 ~~or 2~~, wherein:
   a) said heavy chain variable domain consists of the amino acid sequence of SEQ ID NO: 16; and
   b) said light chain variable domain consists of the amino acid sequence of SEQ ID NO: 17.
4. The humanized antibody according to ~~any one of~~ claim~~s~~ 1 ~~to 3~~, wherein said antibody comprises:
   a) a heavy chain constant region consisting of the amino acid sequence of SEQ ID NO: 18; and
   b) a light chain constant domain consisting of the amino acid sequence of SEQ ID NO: 19.
5. The humanized antibody of claim 1, wherein said anti-body comprises:
   a) a heavy chain variable domain comprising H-CDR1, H-CDR2, and H-CDR3, consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and
   b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2, and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 6.

6. The humanized antibody of claim 1, wherein said anti-body comprises:

a) a heavy chain variable domain comprising H-CDR1, H-CDR2, and H-CDR3, said H-CDR1, H-CDR2, and H-CDR3 consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and

b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2, and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 7, respectively.

7. ~~5.~~ A humanized antibody that binds to human interleukin-22 receptor alpha (IL-22RA), said humanized antibody:

a) comprising ~~which comprises~~ a heavy chain comprising the ~~or consisting of~~ amino acid sequence of SEQ ID NO: 20 and a light chain comprising the ~~or consisting of~~ amino acid sequence of SEQ ID NO: 21~~.~~ ; or

b) comprising a heavy chain consisting of the amino acid sequence of SEQ ID NO: 20 and a light chain consisting of the amino acid sequence of SEQ ID NO: 21.

8. ~~6.~~ A polynucleotide encoding the heavy chain and/or ~~of the humanized antibody according to claim 5.~~ the light a chain of a humanized antibody:

a) comprising a heavy chain comprising the amino acid sequence of SEQ II NO: 20 and a light chain comprising the amino acid sequence of SEQ ID NO: 21; or

b) comprising a heavy chain consisting the amino acid sequence of SEQ ID NO: 20 and a light chain consisting of the amino acid sequence of SEQ ID NO: 21.

~~7.~~ 9. The polynucleotide according to claim 8 ~~6~~, wherein said polynucleotide comprises the amino acid sequence ~~or consists~~ of SEQ ID NO: 22.

~~8. A polynucleotide encoding the light chain of the humanized antibody according to claim 5.~~

~~9.~~ 10. The polynucleotide according to claim 8, wherein said polynucleotide comprises ~~or consists~~ the amino acid sequence of SEQ ID NO: 23.

~~10.~~ 11. An expression vector comprising a ~~A~~ polynucleotide encoding ~~both~~ the heavy chain and/or the light chain of a ~~the~~ humanized antibody: ~~according to claim 5.~~

a) comprising a heavy chain comprising the amino acid sequence of SEQ ID NO: 20 and a light chain comprising the amino acid sequence of SEQ ID NO: 21 ; or

b) comprising a heavy chain consisting of the amino acid sequence of SEQ ID NO: 20 and a light chain consisting of the amino acid sequence of SEQ ID NO): 21.

~~11. An expression vector comprising a) a polynucleotide according to claim 6 or 7 and b) a polynucleotide according to claim 8 or 9.~~

~~12. An expression vector comprising a polynucleotide according to claim 10.~~

~~13. A host cell transformed with a vector according to claim 11 or 12.~~

12. A host cell transformed with an expression vector encoding the heavy chain and/or the light chain of a humanized antibody:

a) comprising a heavy chain comprising the amino acid sequence of SEQ ID NO: 20 and a light chain comprising the amino acid sequence of SEQ ID NO: 21 ; or

b) comprising a heavy chain consisting of the amino acid sequence of SEQ ID NO: 20 and a light chain consisting of the amino acid sequence of SEQ ID NO: 21.

~~14.~~ 13. The host cell according to claim 12 ~~13~~, wherein said cell is a Chinese hamster ovary (CHO) cell.

14. The host cell according to claim 12, wherein said host cell is an isolated host cell.

15. A method of producing a humanized antibody ~~according to any of claims 1 to 5, wherein said method comprises~~ comprising culturing a host cell transformed with an expression vector encoding the heavy chain and/or the light chain of a humanized ~~according to claim 13 or 14, and isolating said~~ antibody~~.~~ :

a) comprising a heavy chain comprising the amino acid sequence of SEQ ID NO: 20 and a light chain comprising the amino acid sequence of SEQ ID NO: 21 ; or

b) comprising a heavy chain consisting of the amino acid sequence of SEQ ID NO: 20 and a light chain consisting of the amino acid sequence of SE ID NO: 21.

16. A pharmaceutical composition comprising wherein said ~~a~~ humanized antibody that binds to human interleukin-22 receptor alpha (IL-22RA) wherein said humanized antibody comprises: ~~according to any of claims 1 to 5 or a humanized antibody produced according to the method of claim 15.~~

a) a heavy chain variable domain comprising H-CDR1, H-CDR2, AND H-CDR3, said H-CDR1, H-CDR2, and H-CDR3 consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and

b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2, and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4,

5, and 6, respectively, or consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 7, respectively.

~~17. A humanized antibody according to any of claims 1 to 5 or a humanized antibody produced according to the method of claim 15 for use as a medicament.~~

~~18. A humanized antibody according to any of claims 1 to 5 or a humanized antibody produced according to the method of claim 15 for use in the treatment of psoriasis, psoriatic arthritis or atopic dermatitis.~~

~~19. Use of a humanized antibody according to any of claims 1 to 5 or a humanized antibody produced according to the method of claim 15 for the preparation of a medicament for the treatment of psoriasis, psoriatic arthritis or atopic dermatitis.~~

17. A method of treating psoriasis, psoriatic arthritis or atopic dermatitis comprising the administration of a therapeutically effective amount of a humanized antibody that binds to human interleukin-22 receptor alpha (IL-22RA) wherein said humanized antibody comprises:

a) a heavy chain variable domain comprising H-CDR1, H-CDR2 and H-CDR3, said H-CDR1 H-CDR2, and H-CDR3 consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and

b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2 and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 6, respectively, or consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 7, respectively.

18. The method of claim 17, wherein said humanized anti-body that binds to human interleukin-22 receptor alpha (IL-22RA) comprises:

a) a heavy chain variable domain comprising H-CDR1, H-CDR2, and H-CDR3, said H-CDR1, H-CDR2, and H-CDR3 consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and

b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2 and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 6.

19. The method of claim 17, wherein said humanized anti-body that binds to human interleukin-22 receptor alpha (IL22RA) which comprises:

a) a heavy chain variable domain comprising H-CDR1, H-CDR2, and H-CDR3, said H-CDR1, H-CDR2, and H-CDR3 consisting of amino acid sequences of SEQ ID NOs: 1, 2 and 3, respectively; and

b) a light chain variable domain comprising L-CDR1, L-CDR2, and L-CDR3, said L-CDR1, L-CDR2, AND L-CDR3, said L-CDR1, L-CDR2, and L-CDR3 consisting of amino acid sequences of SEQ ID NOs: 4, 5 and 7, respectively.