

CLAIMS

1. An isolated antibody that binds to interleukin 22 (IL22) and inhibits or attenuates IL22 binding to IL22 receptor 1 (IL22R1).
2. The antibody according to claim 1, wherein said antibody binds to a region on IL22 such that the binding sterically blocks the interaction between IL22 and IL22R1, and/or wherein said antibody inhibits or attenuates IL22 binding to IL22 binding protein (IL22RA2).
3. The antibody according to claim 1 or 2, wherein said antibody binds to human and/or cynomolgus monkey IL22.
4. The antibody according to any one of claims 1-3, wherein said antibody has dissociation equilibrium constant (KD) of less than 100pM for human IL22.
5. The antibody according to any one of claims 1-4, wherein the antibody specifically binds to the polypeptide VRLIGEKLFGVSM (SEQ ID NO: 96) corresponding to residues 72-85 of the amino-acid sequence of IL22 defined by SEQ ID NO:1.
6. The antibody according to any one of claims 1-5, wherein the antibody binds to an epitope of human IL22, the epitope comprising five or more residues selected from Lys44, Phe47, Gln48, Ile75, Gly76, Glu77, Phe80, His81, Gly82, Val83, Ser84, Met85, Ser86, Arg88, Leu169, Met172, Ser173, Arg175, Asn176 and Ile179 of human IL22 (SEQ ID NO: 1) as determined at the distance of less than 5Å contact distance between the antibody and IL22, wherein said binding is determined using X-ray crystallography.
7. The antibody according to any one of claims 1-6, comprising:
 - a light chain variable region comprising:
 - a CDR-L1 comprising SEQ ID NO:5,
 - a CDR-L2 comprising SEQ ID NO:6, and
 - a CDR-L3 comprising SEQ ID NO:7;
 - and a heavy chain variable region comprising:
 - a CDR-H1 comprising SEQ ID NO:8,
 - a CDR-H2 comprising SEQ ID NO:9, and
 - a CDR-H3 comprising SEQ ID NO:10.
8. The antibody according to any one of claims 1-7, wherein the light chain variable region comprises the sequence given in SEQ ID NO:22 and/or, wherein the heavy chain variable region comprises the sequence given in SEQ ID NO:24.

9. The antibody according to any one of claims 1-7, wherein the light chain variable region comprises the sequence given in SEQ ID NO: 22, or a sequence which is at least 90% identical thereto; and the heavy chain variable region comprises the sequence given in SEQ ID NO: 24, or a sequence which is at least 90% identical thereto.

10. The antibody according to any one of claims 1-7, wherein the antibody comprises a light chain variable region and a heavy chain variable region, wherein

the light chain variable region comprises the sequence given in SEQ ID NO: 22, wherein one or more residues at the positions 91, 95, and/or 96 have been substituted by another amino-acid;

and the heavy chain variable region comprises the sequence given in SEQ ID NO: 24, wherein one or more residues at the positions 54, 55, and/or 107 have been substituted by another amino-acid.

11. The antibody according to claim 7, wherein each CDR either contains up to three amino acid substitutions, and wherein such amino-acid substitutions are conservative.

12. The antibody according to any one of claims 1-11, wherein said antibody is a full length antibody, or an antibody fragment, optionally wherein said antibody fragment is Fab, Fab', F(ab')₂, Fv, dsFv, scFv, or dsscFv.

13. The antibody according to claim 12, wherein the antibody is a Fab comprising a light chain comprising the sequence given in SEQ ID NO: 26 and a heavy chain comprising the sequence given in SEQ ID NO: 28; or wherein the antibody is a Fab comprising CDR-L1/CDR-L2/CDR-L3/CDR-H1/CDR-H2/CDR-H3 comprising sequences given in SEQ ID NOs:5/6/7/8/9/10 respectively, and the remainder of the of the light chain and heavy chain has at least 90% identity or similarity to SEQ ID Nos:26 and 28 respectively.

14. The antibody according to claim 12, wherein the antibody is an IgG1 comprising a light chain comprising the sequence given in SEQ ID NO: 26 and a heavy chain comprising the sequence given in SEQ ID NO: 30; or wherein the antibody is an IgG1 comprising CDR-L1/CDR-L2/CDR-L3/CDR-H1/CDR-H2/CDR-H3 comprising sequences given in SEQ ID NOs:5/6/7/8/9/10 respectively, and the remainder of the of the light chain and heavy chain has at least 90% identity or similarity to SEQ ID Nos:26 and 30 respectively; or wherein the antibody is an IgG4P comprising a light chain comprising the sequence given in SEQ ID NO: 26 and a heavy chain comprising the sequence given in SEQ ID NO: 32; or wherein the antibody is an IgG4P comprising CDR-L1/CDR-L2/CDR-L3/CDR-H1/CDR-H2/CDR-H3 comprising sequences given in SEQ ID NOs:5/6/7/8/9/10 respectively, and the remainder of the of the light chain and heavy chain has at least 90% identity or similarity to SEQ ID Nos:26 and 32 respectively.

15. An isolated polynucleotide encoding the antibody according to any one of claims 1 to 14.
16. An expression vector carrying the polynucleotide of claim 15.
17. A host cell comprising the vector as defined in claim 16.
18. A method of producing the antibody of any one of claims 1 to 14, comprising culturing the host cell of claim 17 under conditions permitting production of the antibody, and recovering the antibody produced.
19. A pharmaceutical composition comprising the antibody of any one of claims 1 to 14, and a pharmaceutically acceptable adjuvant or carrier.
20. The antibody of any one of claims 1 to 14, or the pharmaceutical composition as defined in claim 19, for use as a medicament.
21. Use of the antibody according to any one of claims 1-14 or the pharmaceutical composition according to claim 19 for the manufacture of a medicament for the treatment of an inflammatory skin condition.
22. The use according to claim 21, wherein said inflammatory skin condition is psoriasis, psoriatic arthritis, contact dermatitis, chronic hand eczema or atopic dermatitis.