

CLAIMS

1. A monoclonal antibody which binds to kallikrein 5 (KLK5), wherein the antibody comprises a variable light chain and a variable heavy chain, and wherein:
 - a. the variable light chain comprises a CDR-L1 comprising SEQ ID NO: 1 or 7 or 8 or 9, a CDR-L2 comprising SEQ ID NO: 2 and a CDR-L3 comprising SEQ ID NO: 3; and
 - b. the variable heavy chain comprises a CDR-H1 comprising SEQ ID NO: 4, a CDR-H2 comprising SEQ ID NO: 5 and a CDR-H3 comprising SEQ ID NO: 6 or any one of SEQ ID NO: 10 to 29, preferably 10, 11, 13 to 16, 18, 20, 22 to 25, 27 or 29.
2. The antibody according to claim 1, wherein
 - a. the variable light chain comprises a CDR-L1 comprising SEQ ID NO: 7, a CDR-L2 comprising SEQ ID NO: 2 and a CDR-L3 comprising SEQ ID NO: 3; and
 - b. the variable heavy chain comprises a CDR-H1 comprising SEQ ID NO: 4, a CDR-H2 comprising SEQ ID NO: 5 and a CDR-H3 comprising SEQ ID NO: 10 or 14 or 23.
3. The antibody according to claims 1 or 2, wherein
 - a. the variable light chain comprises a CDR-L1 comprising SEQ ID NO: 7, a CDR-L2 comprising SEQ ID NO: 2 and a CDR-L3 comprising SEQ ID NO: 3; and
 - b. the variable heavy chain comprises a CDR-H1 comprising SEQ ID NO: 4, a CDR-H2 comprising SEQ ID NO: 5 and a CDR-H3 comprising SEQ ID NO: 23.
4. The antibody according to any one of the preceding claims wherein the antibody is a chimeric or humanized antibody.
5. The antibody according to any one of the preceding claims, wherein the antibody is a full-length antibody.
6. The antibody according to claim 5, wherein the full-length antibody is selected from an IgG1, IgG4 or IgG4P.
7. The antibody according to any one of claims 1 to 4, wherein the antibody is selected from a Fab, a Fab', a F(ab')₂, a scFv, a dAb or a V_{HH}.
8. The antibody according to any one of claims 1 to 7, wherein the antibody comprises:
 - a. a variable light chain comprising SEQ ID NO: 30 or 34 or 38 or 42 or 46; and/or

- b. a variable heavy chain comprising SEQ ID NO: 32 or 50 or 54 or 58 or 62 or 66 or 70 or 74 or 78 or 82 or 86 or 90 or 94 or 98 or 102 or 106 or 110 or 114 or 118 or 122 or 126 or 130 or 134, preferably 32 or 50 or 54 or 58 or 62 or 66 or 70 or 74 or 78 or 82 or 86 or 90 or 94 or 98 or 106 or 110 or 114 or 118 or 126 or 134.
- 9. The antibody according to any one of claims 1 to 8, wherein the antibody comprises:
 - a. a variable light chain comprising SEQ ID NO: 38; and/or
 - b. a variable heavy chain comprising SEQ ID NO: 110.
- 10. The antibody according to any one of claims 1 to 6 or 8 or 9, wherein the antibody comprises:
 - a. a light chain comprising SEQ ID NO: 36 or 40 or 44 or 48; and
 - b. a heavy chain comprising SEQ ID NO: 52 or 56 or 60 or 64 or 68 or 72 or 76 or 80 or 84 or 88 or 92 or 96 or 100 or 104 or 108 or 112 or 116 or 120 or 124 or 128 or 132 or 136, preferably 52 or 56 or 60 or 64 or 68 or 72 or 76 or 80 or 84 or 88 or 92 or 96 or 100 or 108 or 112 or 116 or 120 or 128 or 136.
- 11. The antibody according to any one of claims 1 to 8, wherein the antibody comprises:
 - a. a light chain comprising SEQ ID NO: 40; and
 - b. a heavy chain comprising SEQ ID NO: 112.
- 12. The antibody according to any one of the preceding claims wherein KLK5 is human KLK5 comprising SEQ ID NO: 142 or 143 or 144 or cyno KLK5 comprising SEQ ID NO: 151.
- 13. The antibody according to any one of the preceding claims which binds to kallikrein 5 (KLK5), wherein the antibody binds to an epitope of human KLK5 comprising at least one, preferably at least two or more, amino acid residue from the group consisting of Leu212, Ser213, Gln214, Lys215, Arg216, Glu218, Asp219, Ala220, Pro222, Gly233, Pro269, Asn270 and Pro272 with reference to SEQ ID NO: 142.
- 14. The antibody according to claim 13, wherein the epitope is characterized by X-ray crystallography.
- 15. The antibody according to any one of claims 1 to 14, wherein the antibody
 - a. inhibits or reduces the protease activity of KLK5; and/or
 - b. binds to KLK5 when KLK5 is bound to LEKTI, or a fragment of LEKTI; and/or
 - c. does not compete with LEKTI, or a fragment of LEKTI, for binding KLK5; and/or
 - d. forms a complex with KLK5 bound to LEKTI, or a fragment of LEKTI.

16. The antibody according to claim 15 wherein the fragment of LEKTI is human LEKTI domain 5 comprising amino acids 1 to 64 of SEQ ID NO: 145 or LEKTI domain 8 comprising amino acids 1 to 71 of SEQ ID NO: 152.
17. The antibody according to any one of the preceding claims wherein the antibody binds human KLK5, preferably human KLK5 comprising SEQ ID NO: 144 and cynomolgus monkey (cyno) KLK5, preferably cyno KLK5 comprising SEQ ID NO: 151.
18. The antibody according to any one of the preceding claims wherein the antibody does not bind human or cyno kallikrein 2 (KLK2); or human or cyno kallikrein 4 (KLK4); or human or cyno kallikrein 7 (KLK7).
19. An antibody which competes for binding KLK5 with the antibody according to any one of claims 1 to 18; and
- a. cross-blocks or is cross-blocked by the antibody according to any one of claims 1 to 18 for binding KLK5; or
 - b. binds KLK5 to the same epitope as the antibody according to any one of claims 1 to 18; and
- wherein the antibody comprises a heavy chain variable region having at least 90% identity or similarity to the sequence according to SEQ ID NO: 38; and/or comprises a light chain variable region having at least 90% identity or similarity to the sequence according to SEQ ID NO: 110.
20. An isolated polynucleotide encoding the antibody according to any one of claims 1 to 18.
21. The isolated polynucleotide according to claim 20, wherein the polynucleotide encodes:
- a. a light chain variable region, wherein the polynucleotide:
 - i. is at least 90% identical to SEQ ID NO: 31 or 35 or 39 or 43 or 47; or
 - ii. comprises SEQ ID NO: 31 or 35 or 39 or 43 or 47; or
 - iii. consists essentially of SEQ ID NO: 31 or 35 or 39 or 43 or 47; or
 - b. a heavy chain variable region, wherein the polynucleotide:
 - i. is at least 90% identical to SEQ ID NO: 33 or 51 or 55 or 59 or 63 or 67 or 71 or 75 or 79 or 83 or 87 or 91 or 95 or 99 or 103 or 107 or 111 or 115 or 119 or 123 or 127 or 131 or 135; or

- ii. comprises SEQ ID NO: 33 or 51 or 55 or 59 or 63 or 67 or 71 or 75 or 79 or 83 or 87 or 91 or 95 or 99 or 103 or 107 or 111 or 115 or 119 or 123 or 127 or 131 or 135; or
 - iii. consists essentially of SEQ ID NO: 33 or 51 or 55 or 59 or 63 or 67 or 71 or 75 or 79 or 83 or 87 or 91 or 95 or 99 or 103 or 107 or 111 or 115 or 119 or 123 or 127 or 131 or 135; or
 - c. a light chain, wherein the polynucleotide:
 - i. is at least 90% identical to SEQ ID NO: 37 or 41 or 45 or 49; or
 - ii. comprises SEQ ID NO: 37 or 41 or 45 or 49; or
 - iii. consists essentially of SEQ ID NO: 37 or 41 or 45 or 49; or
 - d. a heavy chain, wherein the polynucleotide:
 - i. is at least 90% identical to SEQ ID NO: 53 or 57 or 61 or 65 or 69 or 73 or 77 or 81 or 85 or 89 or 93 or 97 or 101 or 105 or 109 or 113 or 117 or 121 or 125 or 129 or 133 or 137; or
 - ii. comprises SEQ ID NO: 53 or 57 or 61 or 65 or 69 or 73 or 77 or 81 or 85 or 89 or 93 or 97 or 101 or 105 or 109 or 113 or 117 or 121 or 125 or 129 or 133 or 137; or
 - iii. consists essentially of SEQ ID NO: 53 or 57 or 61 or 65 or 69 or 73 or 77 or 81 or 85 or 89 or 93 or 97 or 101 or 105 or 109 or 113 or 117 or 121 or 125 or 129 or 133 or 137.
- 22. A cloning or expression vector comprising one or more polynucleotides according to any one of claims 20 or 21.
- 23. A host cell comprising:
 - a. one or more polynucleotides according to any one of claims 20 or 21 or
 - b. one or more expression vectors according to claim 22.
- 24. A process for the production of an antibody according to any one of claims 1 to 18, comprising culturing the host cell according to claim 23 under suitable conditions for producing the antibody and isolating the antibody produced by the host cell.
- 25. A pharmaceutical composition comprising the antibody according to any one of claims 1 to 18 and one or more pharmaceutically acceptable carriers, excipients or diluents.
- 26. The antibody or antigen-binding fragment thereof according to any one of claims 1 to 18 or the pharmaceutical composition according to claim 25 for use in therapy.

27. The antibody according to any one of claims 1 to 18 or the pharmaceutical composition according to claim 25 for use in the treatment of a disease characterized by dysregulation of KLK5 or by dysregulation of inhibition of KLK5.
28. The antibody for use according to claim 27 wherein the disease is selected from Netherton's Syndrome, Atopic Dermatitis, Ichthyoses, Rosacea, Asthma or Cancer, such as ovarian cancer or bladder cancer or a combination thereof.
29. The antibody for use according to claim 28 wherein the disease is Netherton's Syndrome.
30. The antibody for use according to claim 28 wherein the disease is Atopic Dermatitis.
31. A method of treating diseases characterized by dysregulation of KLK5 or by dysregulation of inhibition of KLK5 in a patient comprising administering to said patient a therapeutically effective amount of an antibody according to any one of claims 1 to 18 or the pharmaceutical composition according to claim 25.
32. The method according to claim 31 wherein the disease is selected from Netherton's Syndrome, Atopic Dermatitis, Ichthyoses, Rosacea, Asthma or Cancer, such as ovarian cancer or bladder cancer.
33. The antibody for use according to claim 32 wherein the disease is Netherton's Syndrome.
34. The antibody for use according to claim 32 wherein the disease is Atopic Dermatitis.