

**CLAIMS**

1. An 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 SEQ ID NO: 62 or SEQ ID NO: 63, 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.
2. The antibody according to claim 1 wherein:
  - a. the variable light chain comprises a CDR-L1 comprising SEQ ID NO: 1, 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.
3. An antibody which binds to kallikrein 5 (KLK5), wherein the antibody binds to an epitope of human KLK5 comprising amino acid residues Arg87, Ala107, Arg110, Lys111, Lys112, Val113, Val137, Lys138, Ser139, Ile140, Pro141, His142, Pro143, Tyr145, Ser146 and His147 with reference to SEQ ID NO: 51.
4. The antibody according to claim 3, wherein the epitope is characterized by X-ray crystallography.
5. The antibody according to any one of claims 1 to 4, wherein the antibody inhibits or reduces the protease activity of KLK5.
6. The antibody according to any one of claims 1 to 5, wherein the antibody binds to KLK5 when KLK5 is bound to LEKTI, or a fragment of LEKTI.
7. The antibody according to any one of claims 1 to 6, wherein the antibody does not compete with LEKTI, or a fragment of LEKTI, for binding KLK5.
8. The antibody according to any one of claims 1 to 7, wherein the antibody forms a complex with KLK5 bound to LEKTI, or a fragment of LEKTI.
9. The antibody according to any one of claims 6 to 8 wherein the fragment of LEKTI is human LEKTI domain 5 comprising amino acids 1 to 64 of SEQ ID NO: 54 or LEKTI domain 8 comprising amino acids 1 to 71 of SEQ ID NO: 61.

10. The antibody according to any one of the preceding claims wherein the antibody binds human KLK5, preferably human KLK5 comprising SEQ ID NO: 53 and cynomolgus monkey (cyno) KLK5, preferably cyno KLK5 comprising SEQ ID NO: 60.
11. 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).
12. The antibody according to any one of claims 3 to 11, 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 SEQ ID NO: 62 or SEQ ID NO: 63, preferably a CDR-L1 comprising SEQ ID NO: 1, 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.
13. The antibody according to any one of the preceding claims wherein the antibody is a chimeric or humanized antibody.
14. The antibody according to any one of the preceding claims, wherein the antibody is a full-length antibody.
15. The antibody according to claim 14, wherein the full-length antibody is selected from an IgG1, IgG4 or IgG4P.
16. The antibody according to any one of claims 1 to 13, wherein the antibody is selected from a Fab, a Fab', a F(ab')<sub>2</sub>, a scFv, a dAb or a V<sub>HH</sub>.
17. The antibody according to any one of claims 1 to 16, wherein the antibody comprises:
  - a. a variable light chain comprising SEQ ID NO: 7 or 11 or 15 or 19 or 23; and/or
  - b. a variable heavy chain comprising SEQ ID NO: 9 or 27 or 31 or 35 or 39 or 43.
18. The antibody according to any one of claims 1 to 15 or 17, wherein the antibody comprises:
  - a. a light chain comprising SEQ ID NO: 13 or 17 or 21 or 25; and
  - b. a heavy chain comprising SEQ ID NO: 29 or 33 or 37 or 41 or 45.
19. The antibody according to claims 17 or 18, wherein amino acid residue glutamine (Gln; Q) in L-CDR1 at position 24 with reference to SEQ ID NO: 15 or 17 is replaced by arginine (Arg; R) or by lysine (Lys; K).
20. The antibody according to any one of the preceding claims wherein KLK5 is human KLK5 comprising SEQ ID NO: 51 or 52 or 53 or cyno KLK5 comprising SEQ ID NO: 60.

21. An antibody which:

- a. Competes for binding KLK5 with the antibody according to any one of claims 1 to 20; and/or
- b. cross-blocks or is cross-blocked by the antibody according to any one of claims 1 to 20 for binding KLK5; and/or
- c. binds KLK5 to the same epitope as the antibody according to any one of claims 1 to 20; and/or
- d. comprises a heavy chain variable region having at least 90% identity or similarity to the sequence according to SEQ ID NO: 29 or 33 or 37 or 41 or 45; and/or
- e. comprises a light chain variable region having at least 90% identity or similarity to the sequence according to SEQ ID NO: 13 or 17 or 21 or 25.

22. An isolated polynucleotide encoding the antibody according to any one of claims 1 to 20.

23. The isolated polynucleotide according to claim 22, wherein the polynucleotide encodes:

- a. a light chain variable region, wherein the polynucleotide:
  - i. is at least 90% identical to SEQ ID NO: 8 (or nucleotides 1 to 330 of SEQ ID NO: 8) or 12 (or nucleotides 1 to 330 of SEQ ID NO: 12) or 16 or 20 or 24 or 64 or 66; or
  - ii. comprises SEQ ID NO: 8 (or nucleotides 1 to 330 of SEQ ID NO: 8) or 12 (or nucleotides 1 to 330 of SEQ ID NO: 12) or 16 or 20 or 24 or 64 or 66; or
  - iii. consists essentially of SEQ ID NO: 8 (or nucleotides 1 to 330 of SEQ ID NO: 8) or 12 (or nucleotides 1 to 330 of SEQ ID NO: 12) or 16 or 20 or 24 or 64 or 66; or
- b. a heavy chain variable region, wherein the polynucleotide:
  - i. is at least 90% identical to SEQ ID NO: 10 or 28 or 32 or 36 or 40 or 44; or
  - ii. comprises SEQ ID NO: 10 or 28 or 32 or 36 or 40 or 44; or
  - iii. consists essentially of SEQ ID NO: 10 or 28 or 32 or 36 or 40 or 44; or
- c. a light chain, wherein the polynucleotide:
  - i. is at least 90% identical to SEQ ID NO: 14 or 18 or 22 or 26 or 65 or 67 or 100 or 101 or 102 or 103 or 104; or
  - ii. comprises SEQ ID NO: 14 or 18 or 22 or 26 or 65 or 67 or 100 or 101 or 102 or 103 or 104; or

- iii. consists essentially of SEQ ID NO: 14 or 18 or 22 or 26 or 65 or 67 or 100 or 101 or 102 or 103 or 104; or
  - d. a heavy chain, wherein the polynucleotide:
    - i. is at least 90% identical to SEQ ID NO: 30 or 34 or 38 or 42 or 46; or
    - ii. comprises SEQ ID NO: 30 or 34 or 38 or 42 or 46; or
    - iii. consists essentially of SEQ ID NO: 30 or 34 or 38 or 42 or 46.
24. A cloning or expression vector comprising one or more polynucleotides according to any one of claims 22 or 23.
25. A host cell comprising:
- a. one or more polynucleotides according to any one of claims 22 or 23 or
  - b. one or more expression vectors according to claim 24.
26. A process for the production of an antibody according to any one of claims 1 to 20, comprising culturing the host cell according to claim 25 under suitable conditions for producing the antibody and isolating the antibody produced by the host cell.
27. A pharmaceutical composition comprising the antibody according to any one of claims 1 to 20 and one or more pharmaceutically acceptable carriers, excipients or diluents.
28. The antibody or antigen-binding fragment thereof according to any one of claims 1 to 20 or the pharmaceutical composition according to claim 27 for use in therapy.
29. The antibody according to any one of claims 1 to 20 or the pharmaceutical composition according to claim 27 for use in the treatment of a disease characterized by dysregulation of KLK5 or by dysregulation of inhibition of KLK5.
30. The antibody for use according to claim 29 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.
31. The antibody for use according to claim 30 wherein the disease is Netherton's Syndrome.
32. The antibody for use according to claim 30 wherein the disease is Atopic Dermatitis.
33. 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 20 or the pharmaceutical composition according to claim 27.

- 34. The method according to claim 33 wherein the disease is selected from Netherton's Syndrome, Atopic Dermatitis, Ichthyoses, Rosacea, Asthma or Cancer, such as ovarian cancer or bladder cancer.
- 35. The antibody for use according to claim 34 wherein the disease is Netherton's Syndrome.
- 36. The antibody for use according to claim 34 wherein the disease is Atopic Dermatitis.