Summary

According to a first aspect, there is provided an isolated IL-1β specific antigen binding protein comprising one or more binding units selected from the group consisting of the following binding units:

(i) a binding unit L1 comprising Kabat residues 23-35 of SEQ ID NO: 3 or Kabat residues 24-33 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L1;

(ii) a binding unit L2 comprising Kabat residues 51-57 of SEQ ID NO: 3 or Kabat residues 49-55 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L2;

(iii) a binding unit L3 comprising Kabat residues 92-102 of SEQ ID NO: 3 or Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L3;

(iv) a binding unit H1 comprising Kabat residues 31-35 of SEQ ID NO: 1 or Kabat residues 31-35 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H1;

(v) a binding unit H2 comprising Kabat residues 50-66 of SEQ ID NO: 1 or Kabat residues 50-65 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H2; and

(vi) a binding unit H3 comprising Kabat residues 99-114 of SEQ ID NO: 1 or Kabat residues 98-108 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H3.

~~According to the second aspect, there is~~ Also provided herein is an isolated, IL-1β specific antigen binding protein that neutralizes IL-1β in a cell stimulation assay at an IC50 value of less than 20nM, less than 15nM, less than 10 nM, less than 5nM, less than 3nM, less than 1nM, less than 0.5nM or less than 0.2nM.

~~According to a third aspect, there is~~ Also provided herein is an isolated IL-1β specific antigen binding protein that inhibits IL-1β induced IL-6 production in a cell inhibition assay at an IC50 value of less than 20nM, less than 15nM, less than 10 nM, less than 5nM, less than 4nM, less than 3nM, less than 1nM, less than 0.5nM or less than 0.4nM.

~~According to a fourth aspect, there is~~ Also provided herein is an isolated, IL-1β specific antigen binding protein that binds IL-1β with a K_D value of less than 10nM, less than 5nM, less than 2nM, less than 1nM, less than 0.5nM, or less than 0.1nM.

~~According to a fifth aspect, there is~~Also provided herein is an isolated, IL-1β specific antigen binding protein that neutralizes human IL-1β at an IC50 value of from 1pM to 100pM.

~~According to a sixth aspect, there is~~Also provided herein is an isolated, IL-1β specific antigen binding protein that neutralizes murine IL-1β at an IC50 value of from 100pM to 1000pM.

~~According to a seventh aspect, there is~~Also provided herein is an isolated, IL-1β specific antigen binding protein wherein said binding protein has an affinity (KD) to human IL-1β of from 1pM to 100pM.

~~According to an eighth aspect, there is~~Also provided herein is an isolated, IL-1β specific antigen binding protein wherein said binding protein has an affinity (KD) to murine IL-1β of from 5pM to 200pM.

~~According to a ninth aspect, there is~~Also provided herein is an isolated antigen binding protein of any one of the preceding claims, for use in treating cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne.

According to a ~~tenth~~ further aspect, there is provided a use of the isolated antigen binding protein as defined above, in the preparation of a medicament for the treatment of cancer, an

inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne.

According to an ~~eleventh~~ yet another aspect, there is provided a composition comprising the antigen binding protein as defined above and a pharmaceutically acceptable carrier.

According to a ~~twelfth~~ further aspect, there is provided an isolated cell line that is capable of producing the antigen binding protein as defined above.

According to ~~a thirteenth~~ one aspect, there is provided an isolated nucleic acid molecule comprising or consisting of sequences selected from SEQ ID NO:1 or SEQ ID NO:2 or 14, or fragments thereof.

According to a ~~fourteenth~~ yet another aspect, there is provided an isolated nucleic acid molecule comprising or consisting of sequences selected from SEQ ID NO:3 or SEQ ID NO:4, 15 or 16, or fragments thereof.

According to a ~~fifteenth~~ further aspect, there is provided a vector comprising the nucleic acid molecule as defined above.

According to ~~a sixteenth~~ one aspect, there is provided a host cell comprising the nucleic acid molecule as defined above.

According to a ~~seventeenth~~ another aspect, there is provided a host cell comprising the vector as defined above.

According to an ~~eighteenth~~ yet another aspect, there is provided a method of producing an antigen binding protein as defined above, comprising culturing the host cell as defined above under suitable conditions and recovering said protein therefrom.

According to ~~a nineteenth aspect~~one example, there is provided a method of treating cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne, wherein the isolated antigen binding protein as defined above is administered to a subject.

Claims

1. An isolated IL-1β specific antigen binding protein comprising one or more binding units selected from the group consisting of the following binding units:

(i) a binding unit L1 comprising Kabat residues 23-35 of SEQ ID NO: 3 or Kabat residues 24-33 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L1;

(ii) a binding unit L2 comprising Kabat residues 51-57 of SEQ ID NO: 3 or Kabat residues 49-55 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L2;

(iii) a binding unit L3 comprising Kabat residues 92-102 of SEQ ID NO: 3 or Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L3;

(iv) a binding unit H1 comprising Kabat residues 31-35 of SEQ ID NO: 1 or Kabat residues 31-35 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H1;

(v) a binding unit H2 comprising Kabat residues 50-66 of SEQ ID NO: 1 or Kabat residues 50-65 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H2; and

(vi) a binding unit H3 comprising Kabat residues 99-114 of SEQ ID NO: 1 or Kabat residues 98-108 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H3.

2. The isolated IL-1β specific antigen binding protein of claim 1, comprising a heavy chain and/or a light chain, in which the heavy chain comprises or consists of an amino acid sequence encoded by the nucleotide sequence selected from SEQ ID NO:1 or SEQ ID NO: 2 or 14 and in which the light chain comprises or consists of an amino acid sequence

encoded by the nucleotide sequence selected from SEQ ID NO:3 or SEQ ID NO: 4, 15 or 16.

3. The isolated IL-1β specific antigen binding protein of claim 1, wherein said Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16 are selected from residues consisting of the group selected from amino acids 1-9 of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12 or SEQ ID NO: 13.

4. An isolated, IL-1β specific antigen binding protein that neutralizes IL-1β in a cell function neutralization assay at an IC50 value of less than 20nM, less than 15nM, less than 10 nM, less than 5nM, less than 3nM, less than 1nM, less than 0.5nM, less than 0.2nM, less than 100pM, less than 50pM, less than 10pM or less than 5pM.

5. The isolated, IL-1β specific antigen binding protein as claimed in claim 4, wherein the IL-1β is human, murine or simian IL-1β.

6. An isolated IL-1β specific antigen binding protein that inhibits IL-1β induced IL-6 production in a cell inhibition assay at an IC50 value of less than 20nM, less than 15nM, less than 10 nM, less than 5nM, less than 4nM, less than 3nM, less than 1nM, less than 0.5nM, less than 0.4nM, less than about 300pM, less than about 200pM, less than about 100pM, less than about 50pM, less than about 10pM or less than about 5pM.

7. The isolated, IL-1β specific antigen binding protein as claimed in claim 6, wherein the IL-1β is human, murine or simian IL-1β.

8. An isolated, IL-1β specific antigen binding protein that binds IL-1β with an affinity (K_D value) of less than 10nM,

less than 5nM, less than 2nM, less than 1nM, less than 0.5nM, less than about 200pM, less than about 100pM, or less than about 5pM.

9. The isolated, IL-1β specific antigen binding protein as claimed in claim 8, wherein the IL-1β is human, murine or simian IL-1β.

10. The isolated antigen binding protein of any of claims 6 to 9, in which the binding protein comprises one or more binding units selected from the group consisting of the following binding units:

(i) a binding unit L1 comprising Kabat residues 23-35 of SEQ ID NO: 3 or Kabat residues 24-33 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L1;

(ii) a binding unit L2 comprising Kabat residues 51-57 of SEQ ID NO: 3 or Kabat residues 49-55 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L2;

(iii) a binding unit L3 comprising Kabat residues 92-102 of SEQ ID NO: 3 or Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L3

(iv) a binding unit H1 comprising Kabat residues 31-35 of SEQ ID NO: 1 or Kabat residues 31-35 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H1;

(v) a binding unit H2 comprising Kabat residues 50-66 of SEQ ID NO: 1 or Kabat residues 50-65 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H2; and

(vi) a binding unit H3 comprising Kabat residues 99-114 of SEQ ID NO: 1 or Kabat residues 98-108 of SEQ ID NO: 2 or 14, or a

variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H3.

11. The isolated antigen binding protein of any one of claims 4 to 10, comprising a heavy chain and/or a light chain, in which the heavy chain comprises or consists of an amino acid sequence encoded by the nucleotide sequence selected from SEQ ID NO:1 or SEQ ID NO: 2 or 14 and in which the light chain comprises or consists of an amino acid sequence encoded by the nucleotide sequence selected from SEQ ID NO:3 or SEQ ID NO: 4, 15 or 16.

12. The isolated antigen binding protein of any one of the preceding claims, wherein said isolated antigen binding protein is capable of specifically binding to IL-1β.

13. The isolated antigen binding protein as claimed in claim 12, wherein the IL-1β is human, murine or simian IL-1β.

14. An isolated, IL-1β specific antigen binding protein that neutralizes human IL-1β at an IC50 value of from 1pM to 5nM.

15. An isolated, IL-1β specific antigen binding protein that neutralizes murine IL-1β at an IC50 value of from 100pM to 15nM.

16. The isolated antigen binding protein of any preceding claim, comprising or consisting of:

(iii) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:1 and a light chain encoded by the nucleotide sequence of SEQ ID NO:3; or

(iv) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:2 or 14 and a light chain encoded by the nucleotide sequence of SEQ ID NO:4, 15 or 16.

17. The isolated IL-1β specific antigen binding protein of any one of the preceding claims, wherein said Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16 are selected from residues consisting of the group selected from amino acids 1-9 of SEQ ID 9, SEQ ID 10, SEQ ID 11, SEQ ID 12 or SEQ ID NO: 13.

18. An isolated, IL-1β specific antigen binding protein wherein said binding protein has an affinity (K_D) to human IL-1β of from 1pM to 200pM.

19. An isolated, IL-1β specific antigen binding protein wherein said binding protein has an affinity (K_D) to murine IL-1β of from 5pM to 500pM.

20. The isolated antigen binding protein of any one of the preceding claims, wherein said protein is an antibody.

21. The isolated antigen binding protein of claim 20, wherein said antibody is monoclonal, polyclonal, bispecific, multispecific or heteroconjugate.

22. The isolated antigen binding protein of claim 20 or 21, wherein said antibody is fully human.

23. The isolated antigen binding protein of any one of claims 20-22, wherein said antibody is of the subtype IgG1, of the subtype IgG2, of the subtype IgG4, or of the subtype IgG3

24. The isolated antigen binding protein of any one of claims 1-23, wherein said protein is a single variable domain, a domain antibody, an antigen binding fragment, an immunologically effective fragment, a single chain Fv, a diabody or a tetravalent bispecific antibody (Tandab).

25. The isolated antigen binding protein of claim 24, wherein said fragment comprises or consists of (i) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:1 and a light chain encoded by the nucleotide sequence of SEQ ID NO:3; or (ii) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:2 or 14 and a light chain encoded by the nucleotide sequence of SEQ ID NO:4, 15 or 16.

26. The isolated antigen binding protein of any preceding claim, wherein the protein is recombinant.

27. The isolated antigen binding protein of any one of the preceding claims, wherein said binding protein further comprises an agent selected from the group consisting of an immunoadhesion molecule, an imaging agent, a therapeutic agent, and a cytotoxic agent.

28. The binding protein of claim 27, wherein said agent is an imaging agent selected from the group consisting of a radiolabel, an enzyme, a fluorescent label, a luminescent label, a bioluminescent label, a magnetic label, and biotin.

29. The binding protein of claim 27, wherein said agent is a therapeutic or cytotoxic agent selected from the group consisting of an anti-metabolite, an alkylating agent, an antibiotic, a growth factor, a cytokine, an anti-angiogenic agent, an anti-mitotic agent, an anthracycline, toxin and

30. The isolated antigen binding protein of any one of the preceding claims, for use in treating cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne.

31. Use of the isolated antigen binding protein of any one of claims 1 to 29, in the preparation of a medicament for the treatment of cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne.

32. A composition comprising the antigen binding protein of any one of claims 1 to 29 and a pharmaceutically acceptable carrier.

33. The composition of claim 32, further comprising one or more therapeutic agents.

34. An isolated cell line that is capable of producing the antigen binding protein of any one of claims 1 to 29.

35. An isolated nucleic acid molecule comprising or consisting of sequences selected from SEQ ID NO:1 or SEQ ID NO:2 or 14, or fragments thereof.

36. An isolated nucleic acid molecule comprising or consisting of sequences selected from SEQ ID NO:3 or SEQ ID NO:4, 15 or 16, or fragments thereof.

37. An isolated nucleic acid molecule according to claim 35 or 36, in which the fragment comprises or consists of a nucleotide sequence having an identity selected from the group consisting of from at least 50%, at least 60%, at least 70%, at least 80% and at least 90% to SEQ ID NO:1, 2, 14, 3, 4, 15 or 16.

38. A vector comprising the nucleic acid molecule according to claim 35, 36 or 37.

39. A vector of claim 38, wherein the vector comprises an expression control sequence operably linked to said nucleic acid molecule.

40. A host cell comprising the nucleic acid molecule according to claim 35, 36 or 37.

41. A host cell comprising the vector of claim 38 or 39.

42. A method of producing an antigen binding protein of any one of claims 1-29, comprising culturing the host cell according to claim 40 or 41 under suitable conditions and recovering said protein therefrom.

43. A method of treating cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne, wherein the isolated antigen binding protein of any one of claims 1 to 29 is administered to a subject.

Claims

1. An isolated IL-1β specific antigen binding protein comprising one or more binding units selected from the group consisting of the following binding units:

(i) a binding unit L1 comprising Kabat residues 23-35 of SEQ ID NO: 3 or Kabat residues 24-33 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L1;

(ii) a binding unit L2 comprising Kabat residues 51-57 of SEQ ID NO: 3 or Kabat residues 49-55 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L2;

(iii) a binding unit L3 comprising Kabat residues 92-102 of SEQ ID NO: 3 or Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit L3;

(iv) a binding unit H1 comprising Kabat residues 31-35 of SEQ ID NO: 1 or Kabat residues 31-35 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H1;

(v) a binding unit H2 comprising Kabat residues 50-66 of SEQ ID NO: 1 or Kabat residues 50-65 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H2; and

(vi) a binding unit H3 comprising Kabat residues 99-114 of SEQ ID NO: 1 or Kabat residues 98-108 of SEQ ID NO: 2 or 14, or a variant thereof which contains at least one amino acid substitution, insertion or deletion in the binding unit H3.

2. The isolated IL-1β specific antigen binding protein of claim 1, comprising a heavy chain and/or a light chain, in which the heavy chain comprises or consists of an amino acid sequence encoded by the nucleotide sequence selected from SEQ ID NO:1 or SEQ ID NO: 2 or 14 and in which the light chain comprises or consists of an amino acid sequence

encoded by the nucleotide sequence selected from SEQ ID NO:3 or SEQ ID NO: 4, 15 or 16.

3. The isolated IL-1β specific antigen binding protein of claim 1, wherein said Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16 are selected from residues consisting of the group selected from amino acids 1-9 of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12 or SEQ ID NO: 13.

4. The isolated, IL-1β specific antigen binding protein of any one of the preceding claims, wherein the isolated, IL-1β specific antigen binding protein neutralizes IL-1β in a cell function neutralization assay at an IC50 value of less than 20nM, less than 15nM, less than 10 nM, less than 5nM, less than 3nM, less than 1nM, less than 0.5nM, less than 0.2nM, less than 100pM, less than 50pM, less than 10pM or less than 5pM.

5. The isolated, IL-1β specific antigen binding protein as claimed in any one of the preceding claims, wherein the IL-1β is human, murine or simian IL-1β.

6. The isolated IL-1β specific antigen binding protein of any one of the preceding claims, wherein the isolated, IL-1β specific antigen binding protein inhibits IL-1β induced IL-6 production in a cell inhibition assay at an IC50 value of less than 20nM, less than 15nM, less than 10 nM, less than 5nM, less than 4nM, less than 3nM, less than 1nM, less than 0.5nM, less than 0.4nM, less than about 300pM, less than about 200pM, less than about 100pM, less than about 50pM, less than about 10pM or less than about 5pM.

7. The isolated, IL-1β specific antigen binding protein of any one of the preceding claims, wherein the isolated, IL-1β

specific antigen binding protein binds IL-1β with an affinity (K_D value) of less than 10nM, less than 5nM, less than 2nM, less than 1nM, less than 0.5nM, less than about 200pM, less than about 100pM, or less than about 5pM.

8. The isolated antigen binding protein of any one of the preceding claims, comprising a heavy chain and/or a light chain, in which the heavy chain comprises or consists of an amino acid sequence encoded by the nucleotide sequence selected from SEQ ID NO:1 or SEQ ID NO: 2 or 14 and in which the light chain comprises or consists of an amino acid sequence encoded by the nucleotide sequence selected from SEQ ID NO:3 or SEQ ID NO: 4, 15 or 16.

9. The isolated antigen binding protein of any one of the preceding claims, wherein said isolated antigen binding protein is capable of specifically binding to IL-1β.

10. The isolated antigen binding protein as claimed in claim 9, wherein the IL-1β is human, murine or simian IL-1β.

11. The isolated, IL-1β specific antigen binding protein of any one of the preceding claims, wherein the isolated, IL-1β specific antigen binding protein neutralizes human IL-1β at an IC50 value of from 1pM to 5nM.

12. The isolated, IL-1β specific antigen binding protein of any one of the preceding claims, wherein the isolated, IL-1β specific antigen binding protein neutralizes murine IL-1β at an IC50 value of from 100pM to 15nM.

13. The isolated antigen binding protein of any preceding claim, comprising or consisting of:

(i) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:1 and a light chain encoded by the nucleotide sequence of SEQ ID NO:3; or

(ii) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:2 or 14 and a light chain encoded by the nucleotide sequence of SEQ ID NO:4, 15 or 16.

14. The isolated IL-1β specific antigen binding protein of any one of the preceding claims, wherein said Kabat residues 88-96 of SEQ ID NO: 4, 15 or 16 are selected from residues consisting of the group selected from amino acids 1-9 of SEQ ID 9, SEQ ID 10, SEQ ID 11, SEQ ID 12 or SEQ ID NO: 13.

15. The isolated, IL-1β specific antigen binding protein of any one of the preceding claims, wherein said binding protein has an affinity (K_D) to human IL-1β of from 1pM to 200pM.

16. The isolated, IL-1β specific antigen binding protein wherein said binding protein has an affinity (K_D) to murine IL-1β of from 5pM to 500pM.

17. The isolated antigen binding protein of any one of the preceding claims, wherein said protein is an antibody.

18. The isolated antigen binding protein of claim 17, wherein said antibody is monoclonal, polyclonal, bispecific, multispecific or heteroconjugate.

19. The isolated antigen binding protein of claim 17 or 18, wherein said antibody is fully human.

20. The isolated antigen binding protein of any one of claims 17-19, wherein said antibody is of the subtype IgG1,

of the subtype IgG2, of the subtype IgG4, or of the subtype IgG3

21. The isolated antigen binding protein of any one of claims 1-20, wherein said protein is a single variable domain, a domain antibody, an antigen binding fragment, an immunologically effective fragment, a single chain Fv, a diabody or a tetravalent bispecific antibody (Tandab).

22. The isolated antigen binding protein of claim 21, wherein said fragment comprises or consists of (i) a heavy chain encoded by the nucleotide sequence of SEQ ID NO: 1 and a light chain encoded by the nucleotide sequence of SEQ ID NO:3; or (ii) a heavy chain encoded by the nucleotide sequence of SEQ ID NO:2 or 14 and a light chain encoded by the nucleotide sequence of SEQ ID NO:4, 15 or 16.

23. The isolated antigen binding protein of any preceding claim, wherein the protein is recombinant.

24. The isolated antigen binding protein of any one of the preceding claims, wherein said binding protein further comprises an agent selected from the group consisting of an immunoadhesion molecule, an imaging agent, a therapeutic agent, and a cytotoxic agent.

25. The binding protein of claim 24, wherein said agent is an imaging agent selected from the group consisting of a radiolabel, an enzyme, a fluorescent label, a luminescent label, a bioluminescent label, a magnetic label, and biotin.

26. The binding protein of claim 24, wherein said agent is a therapeutic or cytotoxic agent selected from the group consisting of an anti-metabolite, an alkylating agent, an

antibiotic, a growth factor, a cytokine, an anti-angiogenic agent, an anti-mitotic agent, an anthracycline, toxin and an apoptotic agent.

27. The isolated antigen binding protein of any one of the preceding claims, for use in treating cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne.

28. Use of the isolated antigen binding protein of any one of claims 1 to 27, in the preparation of a medicament for the treatment of cancer, an inflammatory disease or an autoimmune disease selected from the group consisting of arthritis, inflammatory bowel disease, Crohn's disease, rheumatoid arthritis, gout, diabetes, uveitis, cryopyrin-associated periodic syndromes and inflammatory acne.

29. A composition comprising the antigen binding protein of any one of claims 1 to 27 and a pharmaceutically acceptable carrier.

30. The composition of claim 29, further comprising one or more therapeutic agents.

31. An isolated cell line that is capable of producing the antigen binding protein of any one of claims 1 to 27.

32. An isolated nucleic acid molecule comprising or consisting of sequences selected from SEQ ID NO: 1 or SEQ ID NO:2 or 14, or fragments thereof.

33. An isolated nucleic acid molecule comprising or consisting of sequences selected from SEQ ID NO:3 or SEQ ID NO:4, 15 or 16, or fragments thereof.

34. An isolated nucleic acid molecule according to claim 32 or 33, in which the fragment comprises or consists of a nucleotide sequence having an identity selected from the group consisting of from at least 50%, at least 60%, at least 70%, at least 80% and at least 90% to SEQ ID NO:1, 2, 14, 3, 4, 15 or 16.

35. A vector comprising the nucleic acid molecule according to claim 32, 33 or 34.

36. A vector of claim 35, wherein the vector comprises an expression control sequence operably linked to said nucleic acid molecule.

37. A host cell comprising the nucleic acid molecule according to claim 32, 33 or 34.

38. A host cell comprising the vector of claim 35 or 36.

39. A method of producing an antigen binding protein of any one of claims 1-27, comprising culturing the host cell according to claim 37 or 38 under suitable conditions and recovering said protein therefrom.