CLAIMS

1. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 4.

2. The bispecific antibody or bispecific antibody fragment thereof of claim 1 wherein the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 are linked together with a peptide linker and the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 4 are linked together with a peptide linker.

3. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 5.

4. The bispecific antibody or bispecific antibody fragment thereof of claim 3 wherein the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 are linked together with a peptide linker and the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 5 are linked together with a peptide linker.

5. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises the amino acid sequences of RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDPSDGETR and LKEYGNYDSFYFDV.

6. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises the amino acid sequences of RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDASDGETR, and LKEYGNYDSFYFDV.

7. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to the same epitopes on IL-13 and IL-4 as a bispecific antibody or bispecific antibody fragment thereof comprising a variable light chain comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 4.

8. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to the same epitopes on IL-13 and IL-4 as a bispecific antibody or bispecific antibody fragment thereof comprising a variable light chain comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 5.

9. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to the same epitopes on IL-13 and IL-4 as a bispecific antibody or bispecific antibody fragment thereof comprising the amino acid sequences of RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDPSDGETR and LKEYGNYDSFYFDV.

10. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to the same epitopes on IL-13 and IL-4 as a bispecific antibody or bispecific antibody fragment thereof comprising the amino acid sequences of

RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDASDGETR, and LKEYGNYDSFYFDV.

11. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain comprising amino sequences that are at least 95% identical to the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising amino acid sequences that are at least 95% identical to the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 4.

12. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain comprising amino sequences that are at least 95% identical to the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising amino acid sequences that are at least 95% identical to the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 5.

13. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof competitively inhibits binding of a bispecific antibody or bispecific antibody fragment thereof comprising a variable light chain comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 4.

14. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof competitively inhibits binding of a bispecific antibody or bispecific antibody fragment thereof comprising a variable light chain comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 3 and a variable heavy chain comprising the amino acid sequences of SEQ ID NO: 2 and SEQ ID NO: 5.

15. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof competitively inhibits binding of a bispecific antibody or bispecific antibody fragment thereof comprising the amino acid sequences of RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDPSDGETR and LKEYGNYDSFYFDV.

16. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof competitively inhibits binding of a bispecific antibody or bispecific antibody fragment thereof comprising the amino acid sequences of RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDASDGETR, and LKEYGNYDSFYFDV.

17. The bispecific antibody or bispecific antibody fragment thereof of either claim 2 or 4, wherein the peptide linker consists of the amino acid sequence of SEQ ID NO: 6.

18. The bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15 that further comprises constant region domains.

19. The bispecific antibody or bispecific antibody fragment thereof of claim 18, wherein the constant region domains are C_{H1}, C_{H2} C_{H3}, and C_L.

20. A pharmaceutical composition comprising the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 and a pharmaceutically acceptable carrier.

21. The bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 that is further conjugated to an effector molecule.

22. The bispecific antibody or bispecific antibody fragment thereof of claim 21, wherein the effector molecule is selected from the group consisting of heterologous polypeptides, drugs, radionucleotides, and toxins.

23. The use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 in the manufacture of a medicament for the treatment of an allergic disease in a mammal.

24. The use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 in the manufacture of a medicament for the treatment of cancer.

25. The use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 in the manufacture of a medicament for the treatment of asthma in a mammal.

26. The use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 in the manufacture of a medicament for the treatment of a disease associated with abnormal production of IL-4 and/or IL-13 in a mammal.

27. The use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19 in the manufacture of a medicament for suppressing a TH-2 mediated response in a mammal.

28. A nucleic acid molecule encoding the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1-15, 18, or 19.

29. A vector comprising the nucleic acid molecule of claim 28.

30. A cell comprising the vector of claim 29.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain domain and a variable heavy chain domain, wherein the variable light chain domain comprises the amino acid sequences of SEQ ID NO:1 and SEQ ID NO:3.

2. The bispecific antibody or bispecific antibody fragment thereof of claim 1, wherein the variable heavy chain domain comprises the amino acid sequences of SEQ ID NO:2 and SEQ ID NO:5.

3. The bispecific antibody or bispecific antibody fragment thereof of claim 1, wherein the variable heavy chain domain comprises the amino acid sequences of SEQ ID NO:2 and SEQ ID NO:4.

4. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain domain comprising the amino acid sequences of SEQ ID NO:1 and SEQ ID NO:3, and a variable heavy chain domain comprising the amino acid sequences of SEQ ID NO:2 and SEQ ID NO:4.

5. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises a variable light chain domain comprising the amino acid sequences of SEQ ID NO:1 and SEQ ID NO:3, and a variable heavy chain domain comprising the amino acid sequences of SEQ ID NO:2 and SEQ ID NO:5.

6. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, comprising:

(a) a variable light chain domain comprising the amino acid sequences of SEQ ID NO:1 and SEQ ID NO:3;

(b) a variable heavy chain domain comprising the amino acid sequences of SEQ ID NO:2 and SEQ ID NO:4; and

(c) constant region domains.

7. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises complementarity determining regions (CDRs) defined by the amino acid sequences RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDPSDGETR and LKEYGNYDSFYFDV.

8. A bispecific antibody or bispecific antibody fragment thereof that specifically binds to IL-13 and IL-4, wherein the bispecific antibody or bispecific antibody fragment thereof comprises complementarity determining regions (CDRs) defined by the amino acid sequences RASESVDSYGQSYMH, LASNLES, QQNAEDSRT, HASQNIDVWLS, KASNLHTG, QQAHSYPFT, GFSLTDSSIN, DGRID, DGYFPYAMDF, GYSFTSYWIH, IDASDGETR, and LKEYGNYDSFYFDV.

9. The bispecific antibody or bispecific antibody fragment thereof of claim 4 or claim 6, wherein a peptide linker links the amino acid sequence of SEQ ID NO:1 to the amino acid sequence of SEQ ID NO:3, and a peptide linker links the amino acid sequence of SEQ ID NO:2 to the amino acid sequence of SEQ ID NO:4.

10. The bispecific antibody or bispecific antibody fragment thereof of claim 5, wherein a peptide linker links the amino acid sequence of SEQ ID NO:1 to the amino acid sequence of SEQ ID NO:3, and a peptide linker links the amino acid sequence of SEQ ID NO:2 to the amino acid sequence of SEQ ID NO:5.

11. The bispecific antibody or bispecific antibody fragment thereof of claim 9 or claim 10, wherein the peptide linker consists of the amino acid sequence of SEQ ID NO:6.

12. The bispecific antibody or bispecific antibody fragment thereof of any one of claims 1, 4, or 5 that further comprises constant region domains.

13. The bispecific antibody or bispecific antibody fragment thereof of claim 6 or claim 12, wherein the constant region domains consist of CH1, CH2, CH3 and CL.

14. A nucleic acid molecule encoding the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1 to 13.

15. A vector comprising the nucleic acid molecule of claim 14.

16. An isolated host cell comprising the vector of claim 15.

17. The bispecific antibody or bispecific antibody fragment thereof of any one of claims 1 to 13 that is further conjugated to an effector molecule.

18. The bispecific antibody or bispecific antibody fragment thereof of claim 17, wherein the effector molecule is selected from the group consisting of heterologous polypeptides, drugs, radionucleotides, and toxins.

19. A pharmaceutical composition comprising the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1 to 13, 17 or 18 and a pharmaceutically acceptable carrier.

20. A method of treating in a mammal a disease or condition selected from the group consisting of allergic diseases, asthma, cancer, disease or condition associated with the abnormal production od IL-4 and/or IL-13, idiopathic pulmonary fibrosis, and disease or condition requiring the suppression of a TH-2 mediated response, the method comprising administering to the mammal a therapeutically effective amount of a bispecific antibody or antibody fragment thereof of according to any one of claims 1 to 13, 17 or 18, or of a composition according to claim 19.

21. Use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1 to 13, 17 or 18, in the manufacture of a medicament for the treatment in a mammal of a disease or condition selected from the group consisting of allergic disease, asthma,

cancer, disease or condition associated with the abnormal production of IL-4 and/or IL-13, idiopathic pulmonary fibrosis and disease or condition requiring the suppression of a TH-2 mediated response.

22. Use of the bispecific antibody or bispecific antibody fragment thereof of any one of claims 1 to 13, 17 or 18, in the manufacture of a medicament.

23. The bispecific antibody or bispecific antibody fragment thereof according to claim 1, substantially as hereinbefore described with reference to the examples.