

CLAIMS

What is claimed is:

1. A ~~non-naturally occurring~~ monoclonal antibody comprising:
 a V_H CDR1 region comprising the amino acid sequence SEQ ID NO: 9; a V_H CDR2 region comprising the amino acid sequence of SEQ ID NO: 10; a V_H CDR3 region comprising the amino acid sequence of SEQ ID NO: 11; a V_L CDR1 region comprising the amino acid sequence of SEQ ID NO: 12; a V_L CDR2 region comprising the amino acid sequence of LGS; a V_L CDR3 region comprising the amino acid sequence of SEQ ID NO: 14; and
 a C-terminal heavy chain sequence, wherein the C-terminal heavy chain sequence is SEQ ID NO: 8 or SEQ ID NO: 22 comprising a sequence selected from the group consisting of SEQ ID NO: 7 and SEQ ID NO: 13, or an antigen binding portion thereof.
2. ~~The antibody of claim 1, wherein the C terminal heavy chain sequence is a C_H3 domain sequence.~~
3. ~~The antibody of claim 1 or claim 2, wherein the C terminal heavy chain sequence comprises SEQ ID NO: 7.~~
4. ~~The antibody of claim 1 or claim 2, wherein the C terminal heavy chain sequence comprises SEQ ID NO: 13.~~
5. ~~The antibody of claim 3, wherein the C terminal heavy chain sequence comprises a C_H domain sequence comprising SEQ ID NO: 8.~~
6. ~~The antibody of claim 4, wherein the C terminal heavy chain sequence comprises a C_H domain sequence comprising SEQ ID NO: 22.~~
7. ~~The antibody of any of claims 1-6, wherein the antibody further comprises a V_H-CDR1 region comprising the amino acid sequence SEQ ID NO: 9; a V_H-CDR2 region comprising the amino acid sequence of SEQ ID NO: 10; a V_H-CDR3 region comprising the amino acid sequence of SEQ ID NO: 11; a V_L-CDR1 region comprising the amino acid sequence of SEQ ID NO: 12; a V_L-CDR2 region comprising the amino acid sequence of LGS; a V_L-CDR3~~

~~region comprising the amino acid sequence of SEQ ID NO: 14.~~

~~8. A non-naturally occurring monoclonal antibody, wherein the antibody comprises a V_H CDR1 region comprising the amino acid sequence SEQ ID NO: 9; a V_H CDR2 region comprising the amino acid sequence of SEQ ID NO: 10; a V_H CDR3 region comprising the amino acid sequence of SEQ ID NO: 11; a V_L CDR1 region comprising the amino acid sequence of SEQ ID NO: 12; a V_L CDR2 region comprising the amino acid sequence of LGS; a V_L CDR3 region comprising the amino acid sequence of SEQ ID NO: 14, and a C_H3 domain comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7 and SEQ ID NO: 13, or an antigen-binding portion thereof.~~

~~92. The antibody of any of claims 1-8, wherein the antibody comprises a heavy chain variable region comprising the amino acid sequence of SEQ ID NO: 15, and a light chain variable region comprising the amino acid sequence of SEQ ID NO: 16, or an antigen-binding portion thereof.~~

3. The antibody of claim 1 or claim 2, wherein the C-terminal heavy chain sequence is SEQ ID NO: 8.

4. The antibody of claim 1 or claim 2, wherein the C-terminal heavy chain sequence is SEQ ID NO: 22.

~~10. The antibody of any one of claims 1-9, wherein the antibody comprises an IgG4 C_H1 region comprising the amino acid sequence of SEQ ID NO: 1.~~

~~11. The antibody of any one of claims 1-10, wherein the antibody comprises an IgG4 C_H2 region comprising the amino acid sequence of SEQ ID NO: 2.~~

~~12. The antibody of claim 11, wherein the IgG4 C_H2 region comprises a hinge region.~~

~~13. The antibody of claim 12, wherein the hinge region comprises the sequence of APEFLG (SEQ ID NO: 17).~~

~~14. The antibody of any of claims 1-13, wherein said antibody mitigates high background signal during an immunogenicity analysis.~~

~~15. An assay comprising~~

(a) a solid support, wherein a first component is operably-linked to the solid support;

(b) at least one capture agent,

wherein a second component is operably-linked to the at least one capture agent,

wherein the capture agent comprises a first ~~non-naturally occurring~~ monoclonal antibody of any one of claims 1-14, and

(c) at least one detection agent,

wherein a detectable label is operably-linked to the detection agent, wherein the detection agent comprises a second ~~non-naturally occurring~~ monoclonal antibody of any one of claims 1-14, and

wherein the first component and the second component selectively bind to one another.

~~16. The assay of claim 15, wherein the detection agent comprises dupilumab.~~

~~17. The assay of claim 15 or claim 16, wherein the second non-naturally occurring monoclonal antibody comprises dupilumab.~~

~~18. The assay of any one of claims 15-17, wherein the first component comprises streptavidin.~~

~~19. The assay of any one of claims 15-18~~claim 5 or claim 6, wherein the second component comprises biotin.

~~20. An assay comprising~~

(a) a solid support, wherein a first component is operably-linked to the solid support;

(b) at least one capture agent, wherein a second component is operably-linked to the at least one capture agent and wherein the capture agent comprises the ~~non-naturally~~

occurring monoclonal antibody of any one of claims 1-14; and

(c) at least one detection agent, wherein a detectable label is operably-linked to the detection agent and wherein the detection agent comprises dupilumab; wherein the first component and the second component selectively bind to one another.

~~21~~9. The assay of claim ~~20~~8, wherein the first component comprises streptavidin.

~~22~~10. The assay of claim ~~20-8~~ or ~~21~~9, wherein the second component comprises biotin.

~~23. The assay of any one of claims 20-22, wherein the at least one capture agent does not bind an antibody that does not specifically bind to a sequence of a variable region of dupilumab.~~

~~24. The assay of any one of claims 20-22, wherein the at least one capture agent and the at least one detection agent binds to an antibody that specifically binds to a sequence of a variable region of dupilumab.~~

~~25~~11. A method of determining a level of immunogenicity of a monoclonal antibody therapy in a subject, comprising

(a) contacting a biological sample from the subject with the assay of any one of claims ~~15-24~~5-10 under conditions suitable to allow binding of at least one antibody in the biological sample with the at least one capture agent and to the at least one detection agent, wherein the subject has been administered the monoclonal antibody therapy prior to the contacting step,

(b) detecting a signal from the at least one detection agent, and

(c) identifying the level of immunogenicity of the subject as high when the signal from (b) is above a threshold value or

(d) identifying the level of immunogenicity of the subject as low when the signal from (b) is below the threshold value, wherein

the threshold value is a predetermined value, wherein the threshold value is a safety threshold.

~~26~~12. The method of claim ~~25~~11, wherein the monoclonal antibody therapy comprises an antibody of any one of claims 1-~~14~~4.

~~27~~13. The method of claim ~~25~~11, wherein the monoclonal antibody therapy comprises dupilumab.

~~28~~. The method of any one of claims ~~25-27~~, wherein the threshold is a predetermined value.

~~29~~. The method of claim ~~28~~, wherein the threshold is a safety threshold.

~~30~~14. The method of any one of claims ~~25-29~~11-13, wherein the amount of the monoclonal antibody therapy is a therapeutically-effective dose.

~~31~~15. The method of any one of claims ~~25-30~~11-14, wherein the level of immunogenicity is a baseline level.

~~32~~16. The method of any one of claims ~~25-31~~11-15, wherein the level of immunogenicity is a subsequent level.

~~33~~17. The method of any one of claims ~~25-32~~11-16, wherein the subject is a participant in a clinical trial.

~~34~~18. The method of any one of claims ~~25-33~~11-17, wherein the subject is a patient undergoing a medical treatment.

~~35~~19. The method of claim ~~34~~18, wherein the medical treatment is beginning and the level of immunogenicity is a baseline level.

~~36~~20. The method of claim ~~34~~18, wherein the medical treatment is ongoing and the level of immunogenicity is a subsequent level.

~~37~~21. The method of claim ~~34~~18, wherein the medical treatment is ending and the level of immunogenicity is a final level.

~~38~~22. The method of any one of claims ~~25-37~~11-21, wherein the subject is a healthy individual.

~~39~~23. The method of any one of claims ~~25-37~~11-21, wherein the subject has an inflammatory disease or disorder, an autoimmune disease or disorder, an allergic disease or disorder, an

immune disease or disorder, or a benign proliferative disease or disorder.

4024. The method of claim ~~39~~23, wherein the subject has atopic dermatitis, asthma, allergic rhinitis, allergic conjunctivitis, eosinophilic esophagitis, nasal polyps or a combination thereof.