

CLAIMS

1. A composition comprising an anti-IL-5 antibody, wherein the composition comprises:
 - a) an anti-IL-5 antibody comprising a heavy chain sequence as shown in SEQ ID NO: 1 and a light chain sequence as shown in SEQ ID NO: 2; and
 - b) 3.3% to 20% deamidated anti-IL-5 antibody variants at residue N31 of SEQ ID NO: 2, wherein the deamidated variant is aspartic acid or iso-aspartic acid; and
 - c) $\leq 50\%$ oxidised antibody variant at M64 of SEQ ID NO: 1; and $\leq 3\%$ oxidised antibody variant at W52 of SEQ ID NO: 1.
2. The composition according to claim 1, wherein the composition comprises $\leq 35\%$ deamidated anti-IL-5 antibody variants at residue N386 of SEQ ID NO: 1, wherein the deamidated variant is aspartic acid or iso-aspartic acid.
3. The composition according to claim 1, wherein the composition comprises oxidized anti-IL-5 antibody variants comprising 50% or less of SEQ ID NO: 1 oxidized at methionine 254, 50% or less of SEQ ID NO: 1 oxidized at methionine 360, and 50% or less of SEQ ID NO: 1 oxidized at methionine 430.
4. The composition according to claim 1, wherein the composition comprises
 - d) 35% or less deamidated anti-IL-5 antibody variants at residue N386 of SEQ ID NO: 1, wherein the deamidated variant is aspartic acid or iso-aspartic acid; and
 - e) oxidized anti-IL-5 antibody variants comprising 50% or less of SEQ ID NO: 1 oxidized at methionine 254, 50% or less of SEQ ID NO: 1 oxidized at methionine 360, and 50% or less of SEQ ID NO: 1 oxidized at methionine 430.
5. The composition according to any one of the preceding claims, wherein the composition comprises $\geq 50\%$ SEQ ID NO: 1 C-terminal lysine K449 deleted anti-IL-5 antibody variant.
6. The composition according to any one of the preceding claims, wherein the composition comprises $\geq 50\%$ SEQ ID NO: 1 pyro-glutamate N-terminal anti-IL-5 antibody variant.
7. The composition according to any one of the preceding claims, wherein the composition comprises $\leq 80\%$ acidic anti-IL-5 antibody variants.
8. The composition according to any one of the preceding claims, wherein the composition comprises $\leq 20\%$ aggregated anti-IL-5 antibody variants.

9. A composition comprising a population of anti-IL-5 antibodies comprising

a) an anti-IL-5 antibody comprising a heavy chain sequence having the amino acid sequence shown in SEQ ID NO: 1 and a light chain sequence having the amino acid sequence shown in SEQ ID NO: 2;

b) 35% or less of deamidated asparagine residue at position 386 of SEQ ID NO: 1; and

c) 3.3% to 20% of deamidated asparagine residue at amino acid residue 31 of SEQ ID NO: 2, wherein the deamidated asparagine residue of (b) and (c) is aspartic acid or iso-aspartic acid; and

d) 50% or less oxidized methionine at position 64, 50% or less oxidized methionine at position 254, 50% or less oxidized methionine at position 360, 50% or less oxidized methionine residue at position 430 and 3% or less oxidized tryptophan at position 52 of SEQ ID NO: 1.

10. The composition according to claim 9, wherein the composition comprises 3.3% to 17.5%, 3.3% to 15%, 3.3% to 15%, 3.3% to 12.5%, 3.3% to 10%, 3.3% to 7.5%, or 3.3% to 6.6% deamidated asparagine at residue 31 of SEQ ID NO: 2, wherein the deamidated asparagine residue is aspartic acid or iso-aspartic acid.

11. The composition according to claim 9, wherein the composition comprises: $\geq 92\%$ amino terminal pyroglutamate at residue 1, $\geq 90\%$ carboxy terminal glycine at residue 448, $\leq 6\%$ deamidated asparagine at residue 386, $\leq 1\%$ oxidized tryptophan at residue 52, $\leq 1.5\%$ oxidized methionine at residue 64, $\leq 4.5\%$ oxidized methionine at residue 254, $\leq 0.8\%$ oxidized methionine at residue 430 of SEQ ID NO: 1, and 3.3% to 6.6% deamidated asparagine at residue 31 of SEQ ID NO: 2,

wherein the deamidated asparagine is aspartic acid or iso-aspartic acid.

12. A composition according to any one of the preceding Claims wherein the total amount of anti-IL-5 antibody is at a concentration of between 75 mg/ml to 100 mg/ml.

13. A composition according to any one of the preceding Claims wherein the composition further comprises one or a combination of:

(a) a buffering agent selected from the group consisting of sodium phosphate dibasic heptahydrate, phosphate, citrate, sodium phosphate, potassium phosphate, sodium citrate, and histidine, providing a pH of between 6.8 and 7.2 or a pH of between 6.2 and 6.6; and/or

(b) a sugar; and/or

(c) polysorbate 80; and/or

(d) EDTA.

14. The composition according to any one of the preceding claims, wherein the composition comprises an aqueous liquid formulation comprising 100mg/ml anti-IL-5 antibody and:

(a) 15.5 mM sodium phosphate dibasic heptahydrate and 4.5 mM citric acid monohydrate at pH 6.3,

(b) 12% weight of sucrose to volume,

(c) 0.02% weight of polysorbate 80 to volume, and

(d) 0.05 mM EDTA.

15. The composition according to any one of claims 1 to 13, wherein the composition comprises a lyophilizate which may be reconstituted by the addition of water to produce a formulation comprising: 100 mg/mL anti-IL-5 antibody and:

- (a) 20 mM sodium phosphate dibasic heptahydrate at pH 6.8 to 7.2,
- (b) 12% weight of sucrose to volume, and
- (c) 0.05% weight of polysorbate 80 to volume.

16. The composition according to any one of the preceding Claims wherein the composition has at least 0.70 IL-5 specific antigen binding activity; and/or at least 70% FcRn binding activity, compared with a reference standard composition comprising:

- (a) an antibody having a heavy chain amino acid sequence as shown in SEQ ID NO: 1 and a light chain amino acid sequence as shown in SEQ ID NO:2;
- (b) 98% or more HC C-terminal lysine deleted variant;
- (c) 95% or more HC N-terminal pyroglutamate variant;
- (d) 6% or less deamidated variant;
- (e) 4% or less methionine or cysteine oxidated variant;
- (f) 0.1% or less tryptophan oxidated variant; and,
- (g) 0.4% or less aggregated antibody variant.

17. Use of a composition according to any one of the preceding Claims in the manufacture of a medicament for the treatment of a disease selected from the group consisting of asthma, severe eosinophilic asthma, severe asthma, uncontrolled eosinophilic asthma, eosinophilic asthma, sub-eosinophilic asthma, chronic obstructive pulmonary disease, eosinophilic granulomatosis with polyangiitis, hypereosinophilic syndrome, nasal polyposis, bullous pemphigoid and eosinophilic esophagitis.

18. The use according to Claim 17 wherein the composition is to be administered at a dose of 100 mg once every 4 weeks.

19. The use according to Claim 17 wherein the composition is to be administered at a dose of 300 mg once every 4 weeks.

20. A composition according to any of Claims 1- 16 for use in therapy.

21. A pharmaceutical composition comprising a composition according to any of Claims 1-16 and a pharmaceutically acceptable carrier.