What is claimed is:

1. An anti-glycoprotein antibody or antibody fragment which specifically binds to one or more mannosylated antibodies and antibody fragments produced in Pichia pastoris which anti-glycoprotein antibody or antibody fragment comprises the same complementarity determining regions (CDRs) as the anti-glycoprotein antibody Ab1 wherein:

Ab1 comprises light chain CDRs 1, 2, and 3 and heavy chain CDRs 1, 2, and 3 of SEQ ID NOs: 4, 6, 8, 24, 26, and 28, respectively.

2. The anti-glycoprotein antibody or antibody fragment of claim 1, wherein:

(a) said anti-glycoprotein antibody fragment is selected from an Fab fragment, an Fab' fragment, an F(ab')2 fragment, a monovalent antibody, or a metMab;

(b) said anti-glycoprotein antibody fragment is a Fab fragment;

(c) said anti-glycoprotein antibody or antibody fragment comprises a Fab fragment comprising a variable heavy (VH) chain comprising the CDR 1 sequence of SEQ ID NO:4, the CDR 2 sequence of SEQ ID NO:6, and the CDR 3 sequence of SEQ ID NO:8, and a variable light (VL) chain comprising the CDR 1 sequence of SEQ ID NO:24, the CDR 2 sequence of SEQ ID NO:26, and the CDR 3 sequence of SEQ ID NO:28;

(d) said anti-glycoprotein antibody or antibody fragment comprises a humanized, single chain, or chimeric antibody;

(e) said anti-glycoprotein antibody or antibody fragment is a rabbit antibody or antibody fragment;

(f) said anti-glycoprotein antibody or antibody fragment is bound to a support;

(g) said anti-glycoprotein antibody or antibody fragment is directly or indirectly attached to a detectable label or therapeutic agent;

(h) said anti-glycoprotein antibody or antibody fragment according to any of the foregoing, which comprises a VH polypeptide of: SEQ ID NO: 2, or a variant thereof that exhibits at least 90% sequence identity therewith; and a VL polypeptide of: SEQ ID NO: 22, or a variant thereof that exhibits at least 90%

sequence identity therewith, wherein said anti-glycoprotein antibody specifically binds one or more glycoproteins; or

(i) said anti-glycoprotein antibody or antibody fragment comprises human IgG1, IgG2, IgG3, or IgG4 constant domains.

3. The anti-glycoprotein antibody or antibody fragment **of claim 1 or 2**, wherein said anti-glycoprotein antibody specifically binds to a mannosylated human IgG1 antibody or antibody fragment produced by a *Pichia pastoris* yeast comprising a heavy chain constant polypeptide having the sequence of SEQ ID NO: 201, 205, or 209 or a mannosylated fragment thereof and/or a mannosylated human IgG1 antibody light chain constant polypeptide comprising the sequence of SEQ ID NO: 203, 207, or 211 or a mannosylated fragment thereof.

4. A nucleic acid sequence or nucleic acid sequences which encode an anti-glycoprotein antibody or antibody fragment **according to any one of claims 1-3**, or a vector comprising said nucleic acid sequence or sequences.

5. A cultured or recombinant cell which expresses an anti-glycoprotein antibody or antibody fragment **according to any one of claims 1-3.**

6. A cultured or recombinant cell **according to claim 5**, wherein said cell:

(a) is selected from a mammalian, yeast, bacterial, fungal, or insect cell;
(b) is a yeast cell;
(c) is a diploid yeast cell;
(d) is a yeast cell of the genus *Pichia*; and/or
(e) is *Pichia pastoris*.

7. A method of detecting a mannosylated antibody or mannosylated antibody fragment produced in Pichia pastoris in a sample, comprising: contacting said sample with an anti-glycoprotein antibody **according to any of claims 1-3,** and detecting the binding of said mannosylated antibody or mannosylated antibody fragment with said anti-glycoprotein antibody.

8. The method **of claim 7**, wherein:

(i) said step of detecting the binding of said mannosylated antibody or mannosylated antibody fragment with said anti-glycoprotein antibody comprises:

(a) an ELISA assay,

(b) an ELISA assay which utilizes horseradish peroxidase or europium detection;

(b) said anti-glycoprotein antibody is bound to a support;

(c) the detection step uses a protein-protein interaction monitoring process; and/or

(d) the detection step uses a protein-protein interaction monitoring process that uses light interferometry, dual polarization interferometry, static light scattering, dynamic light scattering, multi-angle light scattering, surface plasmon resonance, ELISA, chemiluminescent ELISA, europium ELISA, far western, or electroluminescence;

(ii) it is effected on multiple fractions from a purification column, wherein based on the detected level of mannosylated antibodies or mannosylated antibody fragments, multiple fractions are pooled to:

(a) produce a purified product depleted for mannosylated antibodies or mannosylated antibody fragments that bind to said anti-glycoprotein antibody, wherein optionally said purified product is suitable for pharmaceutical administration;

(b) produce a purified product depleted for mannosylated antibodies or mannosylated antibody fragments that bind to said anti-glycoprotein antibody, wherein said purified product is suitable for pharmaceutical administration; or

(c) produce a purified product enriched for mannosylated antibodies or mannosylated antibody fragments that bind to said anti-glycoprotein antibody;

(iii) the detected mannosylated antibody or mannosylated antibody fragment is a human antibody or a humanized antibody or fragment thereof;

(iv) the method includes any of the following:

(a) samples or eluate or fractions thereof comprising less than 10% mannosylated antibodies or mannosylated antibody fragments are pooled;

(b) samples or eluate or fractions thereof comprising less than 5% mannosylated antibodies or mannosylated antibody fragments are pooled;

(c) samples or eluate or fractions thereof comprising less than 1% mannosylated antibodies or mannosylated antibody fragments are pooled; and/or

(d) samples or eluate or fractions thereof comprising less than 0.5% mannosylated antibodies or mannosylated antibody fragments are pooled;

(v) the method includes any of the following:

(a) samples or eluate or fractions thereof comprising greater than 90% mannosylated antibodies or mannosylated antibody fragments are pooled;

(b) samples or eluate or fractions thereof comprising greater than 95% mannosylated antibodies or mannosylated antibody fragments are pooled;

(c) samples or eluate or fractions thereof comprising greater than 99% mannosylated antibodies or mannosylated antibody fragments are pooled; or

(d) samples or eluate or fractions thereof comprising greater than 99.5% mannosylated antibodies or mannosylated antibody fragments are pooled;

(vi) the method of any of the foregoing includes pooling different samples or eluate or fractions thereof based on the purity of the desired mannosylated antibody or mannosylated antibody fragment,

(vii) the method of any of the foregoing, wherein the desired mannosylated antibody or mannosylated antibody fragment is purified using a chromatographic support; or

(viii) the method of any of the foregoing further comprising analysis of one or more samples by size exclusion chromatography to monitor impurities.

9. The method **of claim 8**, wherein in step (vi):

(a) samples or eluate or fractions thereof comprising greater than 91% purity are pooled;

(b) samples or eluate or fractions thereof comprising greater than 97% purity are pooled; or

(c) samples or eluate or fractions thereof comprising greater than 99% purity are pooled.

10. The method **of claim 8 or 9**, wherein in step (vii) the chromatographic support comprises:

(a) an affinity ligand;

(b) Protein A and/or Protein G;

(c) a lectin;

(d) a mixed mode chromatographic support;

(e) a mixed mode chromatographic support selected from ceramic hydroxyapatite, ceramic fluoroapatite, crystalline hydroxyapatite, and crystalline fluoroapatite;

(f) a mixed mode chromatographic support comprising a ceramic hydroxyapatite; or

(g) a hydrophobic interaction chromatographic support.

11. A method of decreasing the concentration of a mannosylated antibody or mannosylated antibody fragment produced in *Pichia pastoris* in a sample, comprising:

(i) contacting said sample with an anti-glycoprotein antibody or antigen-binding fragment thereof, thereby allowing said anti-glycoprotein antibody or fragment to bind to said mannosylated antibody or mannosylated antibody fragment, and

(ii) separating said anti-glycoprotein antibody or fragment and said mannosylated antibodies or mannosylated antibody fragments bound thereto from the remainder of said sample, thereby decreasing the concentration of a mannosylated antibody or mannosylated antibody fragment in the sample.

12. The method **of claim 11**, wherein said sample comprises a pharmaceutical reagent suitable for *in vivo* administration.

13. The method **of claim 11 or 12**, wherein said method is effected on pooled fractions from a purification column, wherein said anti-glycoprotein antibody is an anti-glycoprotein antibody which specifically binds to one or more mannosylated antibodies and antibody fragments produced in *Pichia pastoris* which anti-glycoprotein antibody or antibody fragment comprises a variable light chain CDRs 1, 2, and 3 and variable heavy chain CDRs 1, 2, and 3 respecively

comprising the sequences of SEQ ID NOs: 4, 6, 8, and SEQ ID NOs: 24, 26, and 28, respectively.

14. The method **of claim 11, 12, or 13,** wherein said anti-glycoprotein antibody:

(i) said anti-glycoprotein antibody is:

(a) bound to a support;

(b) bound to a comprising a resin; or

(c) bound to a comprising a resin comprising agarose, cross-linked agarose, polyacrylamide, a derivative thereof, or another resin or polymer to which functional groups, peptides, or proteins can be immobilized;

(ii) said detected mannosylated antibody or mannosylated antibody fragment is:

(a) a human antibody or a humanized antibody or fragment thereof;

(b) a monovalent, bivalent, or multivalent antibody; and/or

(c) an antibody of that specifically binds to IL-2, IL-4, IL-6, IL-10, IL-12, IL-13, IL-17, IL-18, IFN-alpha, IFN-gamma, BAFF, CXCL13, IP-10, CBP, angiotensin, angiotensin I , angiotensin II, Nav1.7, Nav1.8, VEGF, PDGF, EPO, EGF, FSH, TSH, hCG, CGRP, NGF, TNF, HGF, BMP2, BMP7, PCSK9 or HRG;

(iii) the concentration of mannosylated antibody or mannosylated antibody fragment in the sample is:

(a) decreased to less than 10% of the total protein in the sample;

(b) decreased to less than 5% of the total protein in the sample;

(c) decreased to less than 1% of the total protein in the sample;

(d) decreased to less than 0.5% of the total protein in the sample;

(e) decreased to less than 0.10% of the total protein in the sample; or

(f) decreased to less than 0.01% of the total protein in the sample;

(iv) the desired mannosylated antibody or mannosylated antibody fragment is purified using a chromatographic support; or

(v) the method further comprises analysis of one or more samples by size exclusion chromatography to monitor impurities.

15. The method **of claim 14,** wherein in step (iii) the concentration of mannosylated antibody or mannosylated antibody fragment in the sample is determined by measuring the mass of mannosylated antibody or mannosylated antibody fragment and/or as a percentage of total mass of polypeptide in the sample.

16. The method **of claim 14 or 15,** wherein in step (iv) the chromatographic support comprises:

(a) an affinity ligand;

(b) Protein A and/or Protein G;

(c) a lectin;

(d) a mixed mode chromatographic support;

(e) a mixed mode chromatographic support selected from ceramic hydroxyapatite, ceramic fluoroapatite, crystalline hydroxyapatite, and crystalline fluoroapatite;

(f) a mixed mode chromatographic support comprising a ceramic hydroxyapatite; or

(g) a hydrophobic interaction chromatographic support.

17. A method of detecting the level of expression of a secreted mannosylated antibody or mannosylated antibody fragment by a *Pichia pastoris* cell, comprising:

(i) binding a capture reagent to said cell;

(ii) culturing said cell, whereby said secreted mannosylated antibody or mannosylated antibody fragment is expressed and secreted from said cell;

(iii) contacting said cell with a detection reagent that binds to said secreted mannosylated antibody or mannosylated antibody fragment; and

(iv) detecting said detection reagent, thereby detecting the level of expression of the secreted mannosylated antibody or mannosylated antibody fragment by said cell, wherein said capture reagent comprises an anti-glycoprotein antibody or antibody fragment is an anti-glycoprotein antibody or antibody fragment which specifically binds to one or more mannosylated antibodies and antibody fragments produced in *Pichia pastoris* and said anti-glycoprotein antibody or antibody fragment comprises a variable light chain CDRs 1,

2, and 3 and variable heavy chain CDRs 1, 2, and 3 respecively comprising the sequences of SEQ ID NOs: 4, 6, 8, and SEQ ID NOs: 24, 26, and 28, respectively.

18. The method **of claim 17**, wherein:

(1) said capture reagent binds irreversibly to said cell;

(2) said capture reagent which comprises said anti-glycoprotein antibody further:

(a) comprises an anti-Fc antibody;

(b) is attached to biotin;

(3) said capture reagent which comprises said anti-glycoprotein antibody further comprises biotin and a binding moiety which comprises an avidin or streptavidin, and said binding moiety and said biotin are linked together through the interaction of the avidin or streptavidin and biotin;

(4) the secreted mannosylated antibody or mannosylated antibody fragment comprises a human antibody or a humanized antibody or fragment thereof; and/or the secreted mannosylated antibody or mannosylated antibody fragment comprises an antibody that specifically binds to IL-2, IL-4, IL-6, IL-10, IL-12, IL-13, IL-17, IL-18, IFN-alpha, IFN-gamma, BAFF, CXCL13, IP-10, CBP, angiotensin, angiotensin I , angiotensin II, Nav1.7, Nav1.8, VEGF, PDGF, EPO, EGF, FSH, TSH, hCG, CGRP, NGF, TNF, HGF, BMP2, BMP7, PCSK9 or HRG;

(5) step (ii) is conducted in a medium comprising polyethylene glycol or another molecular crowding agent,

(6) step (ii) is conducted in a medium comprising polyethylene glycol or another molecular crowding agent, wherein:

(a) said polyethylene glycol is of an average molecular weight between 1000 Da and 100 kDa;

(b) said polyethylene glycol is of an average molecular weight between 5000 Da and 15 kDa;

(c) said polyethylene glycol is of an average molecular weight between 7000 Da and 9000 Da; or

(d) said polyethylene glycol is of an average molecular weight of 8000 Da;

(e) wherein in (a) to (d) said polyethylene glycol is present at a concentration of between 1% and 20% (w/v); between 5% and 15% (w/v); between 8% and 12% (w/v); or at a concentration of 10% (w/v);

(7) step (ii) is conducted in a medium comprising one or more of: Dextrans, Ficoll, and/or BSA;

(8) the detection reagent comprises a fluorescent moiety;

(9) in step (iv) detecting is effected by fluorescence activated cell sorting;

(10) the method is effected on a heterogeneous population of cells;

(11) the method is effected on a heterogeneous population of cells, and the method further comprises enriching said heterogeneous population of cells for cells that express an increased level of said secreted mannosylated antibody or mannosylated antibody fragment;

(12) the method is effected on a heterogeneous population of cells which comprise genetically modified cells;

(13) the method is effected on a heterogeneous population of cells which comprise genetically modified cells, wherein said genetically modified cells comprise cells mutagenized by chemical, radiological, or insertional mutagenesis; or said genetically modified cells comprise a library of genetic knockout cells; or said genetically modified cells comprise cells transformed with a plasmid library; or said genetically modified cells comprise cells transformed with a cDNA library; or said genetically modified cells comprise cells transformed with a cDNA library comprising plasmids containing cDNA sequences operably linked to a high expression promoter; or said genetically modified cells comprise cells transformed with a cDNA library comprising high-copy plasmids; and/or said genetically modified cells comprise cells transformed with a plasmid library comprising genomic DNA or cDNA obtained from a yeast species.

19. The method **of claim 18**, wherein said genetically modified cells comprise cells transformed with a plasmid library comprising genomic DNA or cDNA obtained from a *Pichia pastoris* yeast.

20. The anti-glycoprotein antibody **of Claim 1** which is Ab1, comprising or consisting of SEQ ID NO: 1 and SEQ ID NO: 21.