CLAIMS

1. An isolated antibody that binds to Pregnancy Associated Plasma Protein A (PAPP-A) (SEQ ID NO: 79), wherein the antibody comprises a variable heavy chain (VH) sequence comprising three heavy chain complementarity determining regions (CDR) sequences, CDR-H1, CDR-H2, and CDR-H3, of the VH sequence set forth in SEQ ID NO: 2, and a variable light chain (VL) sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, of the VL sequence set forth in SEQ ID NO: 7, wherein the CDRs are defined according to Kabat, AbM, IMGT, or Chothia numbering schemes.

2. The isolated antibody of claim 0, wherein:

a. CDR-H1 comprises the sequence SYAMH (SEQ ID NO: 3);

b. CDR-H2 comprises the sequence VISYDGSIKYYADAVKG (SEQ ID NO: 4);

c. CDR-H3 comprises the sequence HNRIYSWGWHTFDI (SEQ ID NO: 5);

d. CDR-L1 comprises the sequence RASQDISIYLN (SEQ ID NO: 8);

e. CDR-L2 comprises the sequence GASSLQS (SEQ ID NO: 9); and

f. CDR-L3 comprises the sequence QQADAGPWK (SEQ ID NO: 10).

3. The isolated antibody of claims 1 or 2, wherein the VH sequence comprises the VH sequence set forth in SEQ ID NO: 2.

4. The isolated antibody of any one of claims 1-3, wherein the VL sequence comprises the VL sequence set forth in SEQ ID NO: 7.

5. The isolated antibody of any one of claims 1-4, wherein the VH sequence comprises the VH sequence set forth in SEQ ID NO: 2 and the VL sequence comprises the VL sequence set forth in SEQ ID NO: 7.

6. The isolated antibody of any one of claims 1-5, wherein the antibody comprises a heavy chain comprising the sequence set forth in SEQ ID NO: 1.

7. The isolated antibody of any one of claims 1-6, wherein the antibody comprises a light chain comprising the sequence set forth in SEQ ID NO: 6.

8. The isolated antibody of any one of claims 1-7, wherein the antibody comprises a heavy chain comprising the sequence set forth in SEQ ID NO: 1; and a light chain comprising the sequence set forth in SEQ ID NO: 6.

9. The isolated antibody of any of the above claims, wherein the antibody comprises a chimeric, human, or humanized antibody or antigen binding fragment.

10. The isolated antibody of any of the above claims, wherein the antibody is a monoclonal antibody.

11. The isolated antibody of any of the above claims, wherein the comprises an Fc region, a human Fc region, or a human IgG1 Fc region, optionally wherein the Fc region comprises an L234A/L235A mutation, according to the EU numbering system.

12. An isolated human antibody that binds to Pregnancy Associated Plasma Protein A (PAPP-A) (SEQ ID NO: 79), wherein the antibody comprises a human IgG1 Fc region, two heavy chains comprising the sequence set forth in SEQ ID NO: 1, and two light chains comprising the sequence set forth in SEQ ID NO: 6.

13. The isolated antibody of any of the above claims, wherein the antibody binds to human PAPP-A with a K_D of less than or equal to about 1, 1.5, 2, 2.5, 10, 25, 50, 75, or 100 x 10^{-12} M, as measured by surface plasmon resonance (SPR) assay.

14. The isolated antibody of any of the above claims, wherein the antibody has enzyme blocking or neutralizing activity, optionally wherein the antibody has metalloprotease blocking activity, optionally wherein the antibody blocks PAPP-A cleavage of IGF-binding proteins.

15. An isolated polynucleotide or set of polynucleotides encoding the antibody of any of the above claims, a VH thereof, a VL thereof, a light chain thereof, a heavy chain thereof, or an antigen-binding portion thereof; optionally the isolated polynucleotide or set of polynucleotides is cDNA.

16. A vector or set of vectors comprising the polynucleotide or set of polynucleotides of claim 15.

17. A host cell comprising the polynucleotide or set of polynucleotides of claim 15 or the vector or set of vectors of claim 16.

18. A method of producing an antibody comprising expressing the antibody with the host cell of claim 17 and isolating the expressed antibody.

19. A pharmaceutical composition comprising the isolated antibody of any one of claims 0 to 14 and a pharmaceutically acceptable excipient.

20. A kit comprising the isolated antibody of any one of claims 0 to 14 or the pharmaceutical composition of claim 19 and instructions for use.

21. Use of a composition comprising the anti-PAPP-A antibody of any one of claims 1-14 in the manufacture of a medicament for treating a PAPP-A associated disorder.

22. The use of claim 21, wherein the PAPP-A associated disorder is kidney disease, optionally polycystic kidney disease or autosomal dominant polycystic kidney disease (ADPKD).

23. A composition comprising the anti-PAPP-A antibody of any one of claims 1-14 for use in therapy.