CLAIMS

1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a fusion protein that comprises a polypeptide fused to an immunoglobulin constant domain, wherein the polypeptide comprises at least one a) wild type gene 3 protein (g3p); b) amyloid binding fragment of wild type g3p that comprises the entire N2 domain of g3p; c) mutant or variant g3p that binds amyloid; or d) amyloid binding fragment of mutant or variant g3p.

2. The pharmaceutical composition according to claim 1, wherein the polypeptide further comprises a fragment of an N1 domain or a mutant or variant thereof.

3. The pharmaceutical composition according to claim 2, wherein the polypeptide further comprises an entire N1 domain or a mutant or variant thereof.

4. The pharmaceutical composition according to claim 1, wherein the fusion protein comprises the amino acid sequence of SEQ ID NO:9 or a mutant or variant thereof.

5. The pharmaceutical composition according to claim 1, wherein the fusion protein comprises the amino acid sequence of SEQ ID NO:11, or a mutant or variant thereof.

6. The pharmaceutical composition according to claim 1, wherein the fusion protein comprises the amino acid sequence of SEQ ID NO:13, or a mutant or variant thereof.

7. A polypeptide that binds amyloid for use in the manufacture of a medicament for treatment of Alzheimer's disease, early onset Alzheimer's disease, late onset Alzheimer's disease, presymptomatic Alzheimer's disease, Parkinson's disease, SAA amyloidosis, peripheral amyloidosis, familial amyloidotic polyneuropathy (FAP), Finnish form of FAP (aggregation of gelsolin), familial amyloidotic cardiomyopathy (FAC), senile systemic amyloidosis (SSA), islet amyloid polypeptide (1APP) amyloidosis, disease characterized by formation of amyloid protein by aggregation of IgG light chain, disease characterized by formation of amyloid protein by aggregation of cystatin C, hereditary Icelandic syndrome, senility, multiple myeloma, prion diseases, kuru, Creutzfeldt-Jakob disease (CM), Gerstmann-Straussler-Scheinker disease (GSS), fatal familial insomnia (FFI), scrapie, bovine spongiform encephalitis (BSE), amyotrophic lateral sclerosis (ALS), spinocerebellar ataxia (SCA1, SCA3, SCA6, or SCA7), Huntington's

disease, dentatorubral-pallidoluysian atrophy, spinal or bulbar muscular atrophy, hereditary cerebral amyloid angiopathy, familial amyloidosis, frontotemporal lobe dementia, British/Danish dementia, or familial encephalopathy, wherein the polypeptide binds amyloid and comprises at least one a) wild type gene 3 protein (g3p); b) amyloid binding fragment of wild type g3p; c) mutant or variant g3p that binds amyloid; or d) amyloid binding fragment of mutant or variant g3p; and wherein the medicament does not comprise bacteriophage.

8. A fusion protein for use in the manufacture of a medicament for treatment of Alzheimer's disease, early onset Alzheimer's disease, late onset Alzheimer's disease, presymptomatic Alzheimer's disease, Parkinson's disease, SAA amyloidosis, peripheral amyloidosis, familial amyloidotic polyneuropathy (FAP), Finnish fonn of FAP (aggregation of gelsolin), familial amyloidotic cardiomyopathy (FAC), senile systemic amyloidosis (SSA), islet amyloid polypeptide (1APP) amyloidosis, disease characterized by formation of amyloid protein by aggregation of IgG light chain, disease characterized by formation of amyloid protein by aggregation of cystatin C, hereditary Icelandic syndrome, senility, multiple myeloma, prion diseases, kuru, Creutzfeldt-Jakob disease (CM), Gerstmann-Straussler-Scheinker disease (GSS), fatal familial insomnia (FFI), scrapie, bovine spongifonn encephalitis (BSE), amyotrophic lateral sclerosis (ALS), spinocerebellar ataxia (SCA1, SCA3, SCA6, or SCA7), Huntington's disease, dentatorubral-pallidoluysian atrophy, spinal or bulbar muscular atrophy, hereditary cerebral amyloid angiopathy, familial amyloidosis, frontotemporal lobe dementia, British/Danish dementia, or familial encephalopathy, wherein the fusion protein comprises a polypeptide fused to an immunoglobulin constant domain, and wherein the polypeptide comprises at least one a) wild type gene 3 protein (g3p); b) amyloid binding fragment of wild type g3p; c) mutant or variant g3p that binds amyloid; or d) amyloid binding fragment of mutant or variant g3p; and wherein the medicament does not comprise bacteriophage.

9. The polypeptide of claim 7 or the fusion protein of claim 8, which binds and/or disaggregates fA1342, fasyn, fNM, or ftau.

10. Use of a pharmaceutical composition in the manufacture of a medicament for the reduction of amyloid, the inhibition of amyloid formation, the inhibition of amyloid aggregation, or the removal of and/or the prevention of the formation of toxic oligomers in a patient in need thereof, comprising a pharmaceutically acceptable carrier and a polypeptide that binds amyloid and comprises at least one a) wild type gene 3 protein (g3p); b) amyloid binding fragment of wild

type g3p; c) mutant or variant g3p that binds amyloid; or d) amyloid binding fragment of mutant or variant g3p; wherein the composition does not comprise bacteriophage.

11. The use of the pharmaceutical composition according to claim 10, wherein the polypeptide comprises an amyloid binding fragment of an N2 domain of wild type or mutant or variant g3p.

12. The use of the pharmaceutical composition according to claim 10 or claim 11, wherein the polypeptide comprises an entire N2 domain of wild type or mutant or variant g3p.

13. The use of the pharmaceutical composition according to any one of claims 10-12, wherein the polypeptide further comprises a fragment of an N1 domain of wild type or mutant or variant g3p.

14. The use of the pharmaceutical composition according to any one of claims 10-12, wherein the polypeptide further comprises an entire N1 domain of wild type or mutant or variant g3p.

15. The use of the pharmaceutical composition according to claim 14, wherein the polypeptide comprises a mutant or variant g3p or an amyloid binding fragment of mutant or variant g3p.

16. The use of the pharmaceutical composition according to claim 15, wherein the polypeptide comprises a mutant or variant N1-N2 fragment of g3p, wherein the N1-N2 has reduced melting temperature and higher affinity for amyloid as compared to a corresponding polypeptide comprising a wild type N1-N2 fragment.

17. The use of the pharmaceutical composition according to claim 15 or claim 16, wherein the polypeptide comprises wild type g3p.

18. The use of the pharmaceutical composition according to claim 15 or claim 16, wherein the polypeptide comprises an amyloid binding fragment of wild type g3p.

19. The use of the pharmaceutical composition according to claim 15 or claim 16, wherein the polypeptide further comprises a carrier linked either covalently or non- covalently to the polypeptide.

20. Use of a fusion protein in the manufacture of a medicament for the reduction of amyloid, the inhibition of amyloid formation, the inhibition of amyloid aggregation, or the removal of and/or the prevention of the formation of toxic oligomers in a patient in need thereof, comprising a polypeptide fused to at least one protein domain with which it is not normally associated, wherein the polypeptide comprises at least one a) wild type gene 3 protein (g3p); b) amyloid binding fragment of wild type g3p; c) mutant or variant g3p that binds amyloid; or d) amyloid binding fragment of mutant or variant g3p.

21. The use of the fusion protein according to claim 20, wherein the polypeptide comprises an amyloid binding fragment of an N2 domain of wild type or mutant or variant g3p.

22. The use of the fusion protein according to claim 20 or claim 21, wherein the amyloid binding fragment of wild type or mutant or variant g3p comprises an entire N2 domain.

23. The use of the fusion protein according to claim 21 or claim 22, wherein the amyloid binding fragment of wild type or mutant or variant g3p further comprises a fragment of an N1 domain.

24. The use of the fusion protein according to claim 21 or claim 22, wherein the amyloid binding fragment of wild type or mutant or variant g3p further comprises an entire N1 domain.

25. The use of the fusion protein according to any one of claims 20-24, wherein the polypeptide comprises mutant or variant g3p or an amyloid binding fragment of mutant or variant g3p.

26. The use of the fusion protein according to any one of claims 20-25 wherein the polypeptide comprises wild type g3p.

27. The use of the fusion protein according to any one of claims 20-25, wherein the polypeptide comprises an amyloid binding fragment of wild type g3p.

28. The use of the fusion protein according to any one of claims 20-25 comprising SEQ ID NO:9 or an amyloid binding fragment thereof.

29. The use of the fusion protein according to any one of claims 20-25 comprising SEQ ID NO:11 or an amyloid binding fragment thereof.

30. The use of the fusion protein according to any one of claims 20-25 comprising SEQ ID NO:13 or an amyloid binding fragment thereof.

31. The use of the fusion protein according to claim 20, wherein the at least one protein domain comprises an immunoglobulin constant region.

32. The use of the fusion protein according to claim 31, wherein the immunoglobulin constant region is an Fc fragment.

33. The use of the fusion protein according to claim 32, wherein the Fc fragment is the Fc fragment of an IgGl, an IgG2, an IgG3, an IgG4, or IgM.

34. Use of a pharmaceutical composition comprising a pharmaceutically acceptable carrier and an isolated filamentous phage that expresses 5 or more copies of gene 3 protein (g3p) that binds amyloid, or 5 or more copies of a mutant or variant g3p that binds amyloid in the manufacture of a medicament for the reduction of amyloid, the inhibition of amyloid fomiation, the inhibition of amyloid aggregation, or the removal of and/or the prevention of the fomiation of toxic oligomers in a patient in need thereof.

35. The use of the pharmaceutical composition according to claim 19, wherein the medicament is for the treatment or prevention of Alzheimer's disease, early onset Alzheimer's disease, late onset Alzheimer's disease, presymptomatic Alzheimer's disease, Parkinson's disease, SAA amyloidosis, peripheral amyloidosis, familial amyloidotic polyneuropathy (FAP), Finnish fonn of FAP (aggregation of gelsolin), familial amyloidotic cardiomyopathy (FAC), senile systemic amyloidosis (SSA), islet amyloid polypeptide (1APP) amyloidosis, disease characterized by formation of amyloid protein by aggregation of IgG light chain, disease characterized by formation of amyloid protein by aggregation of cystatin C, hereditary Icelandic syndrome, senility, multiple myeloma, prion diseases, kuru, Creutzfeldt-Jakob disease (CJD), Gerstmann-Straussler-Scheinker disease (GSS), fatal familial insomnia (FFI), scrapie, bovine spongiform encephalitis (BSE), amyotrophic lateral sclerosis (ALS), spinocerebellar ataxia (SCA1, SCA3, SCA6, or SCA7), Huntington's disease, dentatorubral- pallidoluysian atrophy, spinal or bulbar muscular atrophy, hereditary cerebral amyloid angiopathy, familial amyloidosis, frontotemporal lobe dementia, British/Danish dementia, or familial encephalopathy.

36. The use of the pharmaceutical composition according to claim 35, wherein the medicament is for treatment of a patient that is positive for florbetapir when florbetapir is used as an imaging agent in positron emission tomography.

37. Use of a composition comprising a polypeptide that binds amyloid and further comprising a pharmaceutically acceptable carrier, wherein the polypeptide comprises a wild type gene 3 protein (g3p), fragment of wild type g3p, mutant or variant g3p, or fragment of mutant or variant g3p, in the manufacture of a medicament to detect or image an amyloid aggregate.

38. The use according to claim 37, wherein the polypeptide is a fusion protein.

39. The use according to claim 37 or claim 38, wherein the detection or imaging of an amyloid aggregate is used to diagnose Alzheimer's disease, early onset Alzheimer's disease, late onset Alzheimer's disease, presymptomatic Alzheimer's disease, Parkinson's disease, SAA amyloidosis, peripheral amyloidosis, familial amyloidotic polyneuropathy (FAP), Finnish form of FAP (aggregation of gelsolin), familial amyloidotic cardiomyopathy (FAC), senile systemic amyloidosis (SSA), islet amyloid polypeptide (1APP) amyloidosis, disease characterized by formation of amyloid protein by aggregation of IgG light chain, disease characterized by formation of amyloid protein by aggregation of cystatin C, hereditary Icelandic syndrome, senility, multiple myeloma, prion diseases, kuru, Creutzfeldt-Jakob disease (CJD), Gerstmann-Straussler-Scheinker disease (GSS), fatal familial insomnia (FFI), scrapie, bovine spongiform encephalitis (BSE), amyotrophic lateral sclerosis (ALS), spinocerebellar ataxia (SCA1, SCA3, SCA6, or SCA7), Huntington's disease, dentatorubral-pallidoluysian atrophy, spinal or bulbar muscular atrophy, hereditary cerebral amyloid angiopathy, familial amyloidosis, frontotemporal lobe dementia, British/Danish dementia, or familial encephalopathy.