All patents and publications referred to herein are hereby incorporated in their entirety by reference.

SUMMARY OF THE INVENTION

The present invention includes an isolated antibody that binds with greater specificity to an amyloid beta (Aβ) protein globulomer than to an amyloid beta protein monomer. Thus, preferential binding is observed. The antibody may be, for example, a monoclonal antibody such as 8F5 or 8C5. The ratio of binding specificity to the globulomer versus the monomer is at least 1.4. In particular, the ratio is preferably at least about 1.4 to at least about 16.9. (A ratio of 1.0-17.5 including the endpoints) is also considered to fall within the scope of the present invention as well as decimal percentages thereof. For example, 1.1, 1.2, 1.3, …, 2.0, 2.1, 2.2…,17.1, 17.2, 17.3, 17.4, 17.5 as well as all full integers in between and percentages thereof are considered to fall within the scope of the present invention.) The amyloid beta protein monomer may be, for example, Aβ(1-42) monomer or Aβ(1-40) monomer.

In one aspect, there is provided a humanized monoclonal antibody comprising a variable heavy and light chain, wherein:

the three CDRs of said variable heavy chain are SEQ ID NO:5, SEQ ID NO:6 and SEQ ID NO:7, and

the three CDRs of said variable light chain are SEQ ID NO:8, SEQ ID NO:9 and SEQ ID NO:10,

wherein the antibody binds with greater specificity to an amyloid beta protein globulomer than to an amyloid beta protein monomer.

In one aspect, there is provided a pharmaceutical composition comprising an antibody as defined above.

In one aspect, there is provided a vaccine comprising an antibody as defined above and a pharmaceutically acceptable adjuvant.

In one aspect, there is provided a method of diagnosing Alzheimer's Disease in a patient suspected of having this disease comprising the steps of:

(a) contacting a biological sample from said patient with an antibody as defined above for a time and under conditions sufficient for formation of antigen/antibody complexes; and

(b) detecting presence of said antigen/antibody complexes in said sample, presence of said complexes indicating a diagnosis of Alzheimer's Disease in said patient.

In one aspect, there is provided a method of diagnosing Alzheimer's Disease in a patient suspected of having this disease comprising the steps of:

(a) contacting a biological sample from said patient with an antigen that is an amyloid beta (Aβ) protein globulomer for a time and under conditions sufficient for the formation of antigen/antibody complexes;

(b) adding a conjugate to the resulting antibody/antigen complexes for a time and under conditions sufficient to allow said conjugate to bind to the bound antibody, wherein said conjugate comprises an antibody as defined above; and

(c) detecting presence of said antigen/antibody complexes in said sample, presence of said complexes indicating a diagnosis of Alzheimer's Disease in said patient.

In one aspect, there is provided a method of diagnosing Alzheimer's Disease in a patient suspected of having this disease comprising the steps of:

(a) contacting a biological sample from said patient with anti-antibody, wherein said anti-antibody is specific for said antibody as defined above for a time and under conditions sufficient to allow for formation of anti-antibody/antibody complexes, said complexes containing antibody present in said biological sample;

(b) adding a conjugate to resulting anti-antibody/antibody complexes for a time and under conditions sufficient to allow said conjugate to bind to bound antibody, wherein said conjugate comprises an antigen, which binds to a signal generating compound capable of generating a detectable signal; and

(c) detecting a signal generated by said signal generating compound, said signal indicating a diagnosis of Alzheimer's Disease in said patient.

In one aspect, there is provided a method of identifying compounds suitable for active immunization of a patient predicted to develop Alzheimer's Disease comprising the steps of:

(a) exposing one or more compounds of interest to an antibody as defined above for a time and under conditions sufficient for said one or more compounds to bind to said antibody as defined above; and

(b) identifying those compounds which bind to said antibody as defined above, said identified compounds to be used in active immunization in a patient predicted to develop Alzheimer's Disease.

In one aspect, there is provided a kit comprising:

(a) an antibody as defined above and

(b) a conjugate comprising a second Aβ protein globulomer-specific antibody attached to a signal-generating compound capable of generating a detectable signal, wherein said second antibody of said conjugate is different from said antibody as defined above.

In one aspect, there is provided a kit comprising:

(a) an anti-antibody to an antibody as defined above and

(b) a conjugate comprising an Aβ protein globulomer attached to a signal-generating compound capable of generating a detectable signal.

Further, the present invention also encompasses a monoclonal antibody (referred to herein as "8F5") produced by a hybridoma having American Type Culture Collection designation number PTA-7238 as well as the hybridoma that produces this monoclonal antibody (i.e., 8F5). Also, the present invention includes a monoclonal antibody (referred to herein as "8C5") produced by a hybridoma having American Type Culture Collection designation number PTA-7407 as well as the hybridoma that produces this monoclonal antibody (i.e., 8C5).

Additionally, the present invention includes a monoclonal antibody comprising a variable heavy chain encoded by SEQ ID NO:1. This antibody may be murine, human or humanized.