antibodies labeled with FITC to visualize microtubules, and thus neuronal processes in general. The results are shown in Figure ~~13~~18.

[0483] Untreated mouse embryonic cortical neurons showed normal morphology after nine days of culture (Figure ~~13~~18, leftmost panel). Treatment of the cells with Abeta oligomer for three days induced axon degeneration and caused a decrease in the total number of axons (Figure ~~13~~18, lower center panel), and this effect was even more pronounced at four days of treatment (Figure ~~13~~18, upper center panel). In contrast, the cells treated with the combination of Abeta oligomer and anti-Abeta antibody hC2 looked similar to control cells (Figure ~~13~~18, upper and lower right panels). These results indicate that anti-Abeta antibody hC2 was able to protect embryonic mouse cortical neurons from Abeta oligomer-induced degeneration.

Table 6: Positions and changes made in the humanized C2 light chain framework regions

Position Light chain	45	87	50	53
Mouse C2VK	K	F	K	N
Humanized C2HuV$_K$l	Q	Y	K	N
Humanized C2HuV$_K$2	Q	F	K	N
Humanized C2HuVR3	K	Y	K	N
Humanized C2HuV$_K$4	K	F	K	N
Human Germline dpkl 5	Q	Y	L	N
Mouse C2V$_K$-R			R	
Mouse C2VK-S				S

Table 7: Positions and changes made in the humanized C2 heavy chain framework regions

Position Heavy chain	47	94
Mouse C2VHAF	L	S
Humanized C2HuVHAFl	W	R
Humanized C2HuVHAF2	W	S
Humanized C2HuVHAF3	L	R

CLAIMS:

1. An *in vitro* method for diagnosing an ocular disease, wherein the ocular disease is cortical visual deficits, glaucoma, optic nerve drusen, optic neuropathy, optic neuritis, cataract, ocular amyloidosis, or optic nerve drusen, in a subject comprising detecting the immunospecific binding of a humanized antibody or fragment thereof to beta amyloid in a sample from the subject suspected to contain beta amyloid, which includes the steps of

(a) bringing the sample into contact with the humanized antibody or fragment thereof, wherein the humanized antibody or fragment thereof comprises a heavy chain complementarity determining region (CDR) I having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6;

(b) allowing the humanized antibody or fragment thereof to bind to beta amyloid to form an immunological complex;

(c) detecting the formation of the immunological complex; and

(d) correlating the presence or absence of the immunological complex with the presence or absence of beta amyloid in the sample.

2. An *in vitro* method for diagnosing a predisposition to an ocular disease, wherein the ocular disease is cortical visual deficits, glaucoma, optic nerve drusen, optic neuropathy, optic neuritis, cataract, ocular amyloidosis, or optic nerve drusen, in a subject comprising detecting the specific binding of a humanized antibody or fragment thereof to beta amyloid in a sample from the subject suspected to contain beta amyloid, which includes the steps of

(a) bringing the sample into contact with the humanized antibody or fragment thereof, wherein the humanized antibody or fragment thereof comprises a heavy chain CDRI having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6;

(b) allowing the humanized antibody or fragment thereof to bind to beta amyloid in the sample to form an immunological complex;

(c) detecting the formation of the immunological complex;

(d) correlating the presence or absence of the immunological complex with the presence or absence of beta amyloid in the sample; and

(e) comparing the amount of said immunological complex to a normal control value,

wherein an increase in the amount of said complex compared to a normal control value indicates that said subject is suffering from or is at risk of developing cortical visual deficits, glaucoma, optic nerve drusen, optic neuropathy, optic neuritis, cataract, ocular amyloidosis, or optic nerve drusen.

3. An *in vitro* method for monitoring minimal residual ocular disease, wherein the ocular disease is cortical visual deficits, glaucoma, optic nerve drusen, optic neuropathy, optic neuritis, cataract, ocular amyloidosis, or optic nerve drusen, in a subject following treatment with a pharmaceutical composition,

wherein the pharmaceutical composition comprises a therapeutically effective amount of a humanized antibody or fragment thereof that binds to beta amyloid, wherein the humanized antibody or fragment thereof comprises a heavy chain CDRl having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6;

and wherein said method comprises:

(a) bringing a sample from the subject suspected to contain beta amyloid into contact with the humanized antibody or fragment thereof;

(b) allowing the humanized antibody or fragment thereof to bind to beta amyloid to form an immunological complex;

(c) detecting the formation of the immunological complex;

(d) correlating the presence or absence of the immunological complex with the presence or absence of beta amyloid in the sample; and

(e) comparing the amount of said immunological complex to a normal control value,

wherein an increase in the amount of said complex compared to a normal control value indicates that said subject still suffers from minimal residual ocular disease.

4. An *in vitro* method for predicting responsiveness of a subject being treated with the pharmaceutical composition for the treatment of an ocular disease, wherein the ocular disease is cortical visual deficits, glaucoma, optic nerve drusen, optic neuropathy, optic neuritis, cataract, ocular amyloidosis, or optic nerve drusen,

wherein the pharmaceutical composition comprises a therapeutically effective amount of a humanized antibody or fragment thereof that binds to beta amyloid, wherein the humanized antibody or fragment thereof comprises a heavy chain CDRI having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6;

and wherein said method comprises:

(a) bringing a sample from the subject suspected to contain beta amyloid into contact with the humanized antibody or fragment thereof;

(b) allowing the humanized antibody or fragment thereof to bind to beta amyloid to form an immunological complex;

(c) detecting the formation of the immunological complex;

(d) correlating the presence or absence of the immunological complex with the presence or absence of beta amyloid in the sample; and

(e) comparing the amount of said immunological complex to a normal control value,

wherein a decrease in the amount of said immunological complex indicates that said subject has a high potential of being responsive to the treatment.

5. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a light chain variable region of SEQ ID NO: 12 and a heavy chain variable region of SEQ ID NO: 15.

6. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a light chain variable region of SEQ ID NO: 12.

7. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a light chain of SEQ ID NO: 13.

8. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a heavy chain variable region of SEQ ID NO: 15.

9. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a heavy chain of SEQ ID NO: 16.

10. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a heavy chain of SEQ ID NO: 16 with a deletion in the terminal Lys in position 439.

11. The method of any one of claims 1 to 4, wherein the humanized antibody comprises a light chain of SEQ ID NO: 13 and a heavy chain of SEQ ID NO: 16.

12. The method of any one of claims 1 to 4, wherein the humanized antibody comprises a light chain of SEQ ID NO: 13 and a heavy chain of SEQ ID NO: 16 with a deletion in the terminal Lys in position 439.

13. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises:

(a) a heavy chain variable region comprising the amino acid Ser in Kabat position 94;
(b) a heavy chain variable region comprising the amino acid Leu in Kabat position 47;
(c) a light chain variable region comprising the amino acid Lys or Gln in Kabat position 45;
(d) a light chain variable region comprising the amino acid Phe or Tyr in Kabat position 87;
(e) a light chain variable region comprising the amino acid Lys or Arg in Kabat position 50; and/or
(f) a light chain variable region comprising the amino acid Asn or Ser in Kabat position 53.

14. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a heavy chain variable region that is at least 98% identical to SEQ ID NO: 15.

15. The method of any one of claims 1 to 4, wherein humanized antibody or fragment thereof comprises a light chain variable region that is at least 98% identical to SEQ ID NO: 12.

16. The method of any one of claims 1 to 4, wherein the humanized antibody or fragment thereof comprises a heavy chain variable region that is at least 98% identical to SEQ ID NO: 15 and a light chain variable region that is at least 98% identical to SEQ ID NO: 12.

17. The method of any one of claims 1 to 8 or 14 to 16, wherein the humanized antibody or fragment thereof is of an IgG4 isotype.

18. The method of any one of claims 1 to 17, wherein the ocular disease is cortical visual deficits, optic neuritis, or lattice dystrophy.

19. The method of any one of claims 1 to 17, wherein the ocular disease is glaucoma.

20. The method of claim 19, wherein the glaucoma is selected from the group consisting of chronic open-angle glaucoma (COAG), acute angle closure glaucoma (AACG), mixed or combined mechanism glaucoma, normal tension glaucoma, congenital glaucoma, secondary glaucoma, pigmentary glaucoma and exfoliative glaucoma.

21. The method of any one of claims 1 to 19, wherein the subject is a mammal.

22. The method of claim 21, wherein the mammal is a human.

CLAIMS:

1. An *in vitro* method for diagnosing an ocular disease associated with amyloid-beta-related pathological abnormalities/changes in the tissues of the visual system, in a subject comprising detecting the immunospecific binding of a humanized antibody or fragment thereof to an epitope of amyloid protein in a sample, which includes the steps of

    (a) bringing the sample from the subject suspected to contain amyloid protein into contact with a humanized antibody or fragment thereof that binds an epitope of an amyloid protein and comprises a heavy chain complementarity determining region (CDR) 1 having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6; wherein the antibody is of the IgG4 isotype;

    (b) allowing the antibody or epitope-binding fragment thereof to bind to amyloid protein to form an immunological complex;

    (c) detecting the formation of the immunological complex; and

    (d) correlating the presence or absence of the immunological complex with the presence or absence of amyloid protein in the sample.

2. An *in vitro* method for diagnosing a predisposition to an ocular disease associated with amyloid-beta-related pathological abnormalities/changes in the tissues of the visual system, in a subject comprising detecting the specific binding of a humanized antibody or fragment thereof to an epitope of amyloid protein in a sample, which includes the steps of

(a) bringing the sample from the subject suspected to contain amyloid protein into contact with an antibody or fragment thereof that binds to an epitope of the amyloid protein and comprises a heavy chain CDR1 having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6; wherein the antibody is of the IgG4 isotype;

(b) allowing the antibody or epitope-binding fragment thereof to bind to any amyloid protein in the sample to form an immunological complex;

(c) detecting the formation of the immunological complex;

(d) correlating the presence or absence of the immunological complex with the presence or absence of amyloid protein in the tissues of the visual system; and

(e) comparing the amount of said immunological complex to a normal control value,

wherein an increase in the amount of said complex compared to a normal control value indicates that said patient is suffering from or is at risk of developing an ocular disease associated with amyloid-beta-related pathological abnormalities/changes in the tissues of the visual system.

3. An *in vitro* method for monitoring minimal residual ocular disease associated with amyloid-beta-related pathological abnormalities/changes in the tissues of the visual system, in a subject following treatment with a pharmaceutical composition,

wherein the pharmaceutical composition comprises a therapeutically effective amount of a humanized antibody or fragment thereof that binds to an epitope of an amyloid protein, wherein the antibody or epitope-binding fragment thereof comprises

a heavy chain CDRl having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6; and wherein the antibody is of the IgG4 isotype

and wherein said method comprises:

(a) bringing a sample from the subject suspected to contain amyloid protein into contact with a humanized antibody or fragment thereof that binds to an epitope of amyloid protein and comprises a heavy chain CDRl having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6; wherein the antibody is of the IgG4 isotype;

(b) allowing the antibody or epitope-binding fragment thereof to bind to amyloid protein to form an immunological complex;

(c) detecting the formation of the immunological complex;

(d) correlating the presence or absence of the immunological complex with the presence or absence of amyloid protein in the sample; and

(e) comparing the amount of said immunological complex to a normal control value,

wherein an increase in the amount of said complex compared to a normal control value indicates that said patient still suffers from minimal residual ocular

disease associated with amyloid-beta-related pathological abnormalities/changes in the tissues of the visual system.

4. An *in vitro* method for predicting responsiveness of a subject being treated with the pharmaceutical composition for the treatment of an ocular disease associated with amyloid-beta-related pathological abnormalities/changes in the tissues of the visual system,

wherein the pharmaceutical composition comprises a therapeutically effective amount of a humanized antibody or fragment thereof that binds to an epitope of an amyloid protein, wherein the antibody or epitope-binding fragment thereof comprises a heavy chain CDRl having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6; and wherein the antibody is of the IgG4 isotype

and wherein said method comprises:

(a) bringing a sample from the subject suspected to contain amyloid protein into contact with a humanized antibody or fragment thereof that binds to an epitope of an amyloid protein and comprises a heavy chain CDRl having the amino acid sequence of SEQ ID NO: 1; a heavy chain CDR2 having the amino acid sequence of SEQ ID NO: 2; a heavy chain CDR3 having the amino acid sequence of SEQ ID NO: 3; a light chain CDR1 having the amino acid sequence of SEQ ID NO: 4; a light chain CDR2 having the amino acid sequence of SEQ ID NO: 5, the amino acid sequence RVSNRFS, or the amino acid sequence KVSSRFS; and a light chain CDR3 having the amino acid sequence of SEQ ID NO: 6; wherein the antibody is of the IgG4 isotype;

(b) allowing the antibody or epitope-binding fragment thereof to bind to amyloid protein to form an immunological complex;

(c) detecting the formation of the immunological complex;

(d) correlating the presence or absence of the immunological complex with the presence or absence of amyloid protein in the sample; and

(e) comparing the amount of said immunological complex to a normal control value,

wherein a decrease in the amount of said immunological complex indicates that said patient has a high potential of being responsive to the treatment.

5. The method of any one of claims 1 to 4, wherein the antibody or epitope-binding fragment thereof comprises a light chain variable region of SEQ ID NO: 12 and a heavy chain variable region of SEQ ID NO: 15.

6. The method of any one of claims 1 to 4, wherein the ocular disease is selected from the group consisting of cortical visual deficits, glaucoma, optic nerve drusen, optic neuropathy, optic neuritis, cataract, ocular amyloidosis and lattice dystrophy.

7. The method of claim 6, wherein the ocular disease is glaucoma.

8. The method of claim 7, wherein the glaucoma is selected from the group consisting of chronic open-angle glaucoma (COAG), acute angle closure glaucoma (AACG), mixed or combined mechanism glaucoma, normal tension glaucoma, congenital glaucoma, secondary glaucoma, pigmentary glaucoma and exfoliative glaucoma.

9. The method of any one of claim 1 to 4, wherein the ocular disease is not macular degeneration.

10. The method of any one of claims 1 to 9, wherein the subject is a mammal.

11. The method of claim 10, wherein the mammal is a human.