Claim

1. A system for performing fluorescent ligand scanning on a subject's eye, the system comprising:

a display screen showing an image of the eye to allow an operator to select a location in the lens of the eye to be measured; and

an optical unit coupled to a processor for executing fluorescent ligand scanning on the selected location in the lens of the eye and for collecting data associated with fluorescent ligand scanning performed, the data being collected from a nucleus region of the lens of the eye and from a supranucleus region of the lens of the eye,

wherein the processor displays the data on the display screen for review by the operator;

wherein the data collected includes the average fluorescence intensity associated with fluorescent ligand scanning performed; and

wherein a ratio (FLS_{Norm}) between the average fluorescence intensity (I_{FLS-N}) associated with fluorescent ligand scanning of a location in the nucleus region of the lens of the eye and average fluorescence intensity (I_{FLS-SN}) associated with fluorescent ligand scanning of a location in the supranucleus region of the lens of the eye is determined in accordance with the equation $FLS_{Norm} = I_{FLS-SN}/I_{FLS-N}$, where an increase in FLS_{Norm} indicates an increase in the presence of a material or object in the eye.

2. The system of claim 1, wherein data from fluorescent ligand scanning is displayed on the same display screen.

3. The system of claim 1, wherein the data is collected in cycles of no more than 60 msec.

4. The system of claim 3, wherein the system executes up to ten consecutive cycles.

5. The system of claim 1, wherein the data is displayed on the display screen as test settings, front view and cross-sectional view images of the eye, average intensity values for fluorescent ligand scanning, graphical depictions of autocorrelation functions for fluorescent ligand scanning, and curve fit parameters based on an exponential fit to the autocorrelation data.

6. The system of claim 1, wherein the system detects the presence of a material or object in the eye.

7. The system of claim 6, wherein the material or object is β-amyloid protein.

8. The system of claim 1, wherein at least a portion of the data collected is used to track the progress of a disease.

9. The system of claim 1, wherein the measurement quality of fluorescent ligand scanning is analyzed using curve $y(t) = Ie^{-kt}$, where I is the average intensity, k is the decay time constant and t is time.

10. The system of claim 1, wherein the processor measures first data of fluorescence of the eye before introducing an imaging agent into the eye and measures second data of fluorescence of the eye after introducing the imaging agent, and compares the first data with the second data.

11. The system of claim 10, wherein comparing the first data with the second data includes subtracting the first data from the second data.

12. A method of performing fluorescent ligand scanning to a subject's eye, the method comprising:

selecting a location in the eye to be analyzed;

performing fluorescent ligand scanning on the selected location;

collecting data associated with fluorescent ligand scanning; and

presenting the data for operator review;

wherein the data collected includes average fluorescence intensity associated with fluorescent ligand scanning performed;

wherein the average intensity data is collected from locations in a nucleus region of the lens of the eye and a supranucleus region of the lens of the eye;

and wherein there is determined a ratio between the average fluorescence intensity from the nucleus region of the lens of the eye and average fluorescence intensity from the supranucleus region of the lens of the eye.

13. The method of claim 12, wherein performing fluorescent ligand scanning comprises:

illuminating the subject's eye;

measuring first data of fluorescence of the eye before introducing an imaging agent into the eye;

introducing the imaging agent into the eye;

measuring second data of fluorescence of the eye after introducing the imaging agent into the eye; and

comparing the first data with the second data.

14. The method of claim 13, wherein comparing the first data with the second data includes subtracting the first data from the second data.

15. The method of claim 13, wherein the first data and the second data are the average fluorescence intensity associated with fluorescent ligand scanning performed.

16. The method of claim 13, wherein the measurement of the second data is taken no more than 24 hours after introducing the imaging agent into the eye.

17. The method of claim 12, wherein the method is capable of detecting the presence of a material or object in the eye.

18. The method of claim 17, wherein the material or object is β-amyloid.

19. The method of claim 12, wherein the progress of a disease can be tracked by measuring levels of fluorescence in the eye.

20. A system for performing fluorescent ligand scanning on a subject's eye, the system comprising:

a light source configured to transmit light toward the subject's eye;

a lens configured to focus light sent from the source and received from the subject's eye;

a measurement reflector disposed to receive at least a portion of the focused light and configured to reflect a first portion of the received light;

a camera configured and disposed to receive at least a portion of the received light and configured to provide indicia of an image corresponding to the first portion of the received light;

a display screen for displaying the image to allow an operator to select regions of the eye for analyzing; and

a processor coupled to the camera and configured to analyze fluorescence from fluorescent ligand scanning to detect a material or object of interest located in selected regions of the eye;

wherein average intensity of fluorescence is analyzed for a supranucleus region of the lens of the eye and a nucleus region of the lens of the eye;

and wherein a correlation factor for evaluating the presence of the material or object of interest in the eye is provided by comparing the average fluorescence intensity from the nucleus region of the lens of the eye to the average fluorescence intensity for the supranucleus region of the lens of the eye.

21. The system of claim 20, wherein the material or object of interest is β-amyloid.

22. The system of claim 20, wherein the processor measures the fluorescence intensity from a region of the eye before introduction of an imaging agent and after introduction of an imaging agent to determine the difference between the two intensities.

23. The system of claim 20, wherein the processor displays data on the display screen for operator review, the data including information on fluorescent ligand scanning performed, including average intensity of fluorescence.

24. The system of claim 20, further comprising a computer containing computer-readable, computer-executable instructions for controlling the system to execute fluorescent ligand scanning and display data from fluorescent ligand scanning on the display screen.

25. The system of claim 20, wherein the processor executes an autocorrelation function to evaluate whether data has been effected by movement of the subject while fluorescent ligand scanning is being performed.