**CLAIMS**

1. An apparatus for altering an eye color of a patient, the apparatus comprising:

a laser system configured to deliver laser light to stromal pigment in an iris of the eye of the patient;

a control system configured to control delivery of the laser light by the laser system; and

a microbubble monitoring system configured to image or to acoustically monitor an anterior surface of the iris to detect microbubbles during delivery of the laser light to the iris, the control system being configured to control delivery of the laser light based on detection of microbubbles by the microbubble monitoring system.

2. The apparatus as claimed in claim 1, in which the microbubble monitoring system comprises at least one of a video microscope, an optical monitoring system configured to capture the increased light reflection from a bubble/water interface, an electron microscopy system, and a hydrophone.

3. The apparatus as claimed in claim 1 or claim 2, further comprising:

a transient recorder configured to record output data from the microbubble monitoring system; and

a computer configured to analyse the output data.

4. The apparatus as claimed in any preceding claim, in which the control system is configured to control the delivery of the laser light such that the said delivery raises the temperature of the stromal pigment by 115 - 125° Celsius.

5. The apparatus as claimed in any preceding claim, which further comprises:

an image sensor configured to image the iris prior to delivery of the laser light to generate a plurality of images of the iris;

image processing software for analyzing the images and generating, based on the image analysis, a mapping of the iris, the mapping comprising a plurality of regions corresponding to varying absorption coefficients of a treatment wavelength of the stromal pigment of the iris;

the control system being configured, based on the mapping laser system, to control the laser system to deliver laser light at a first laser power to a location in the eye of the patient, in which the first laser power is sufficient to cause elimination of at least a portion of stromal pigment in the iris.

6. The apparatus as claimed in any preceding claim, further comprising:

an optical tracking system for tracking an eye of the patient during the delivery of the laser light.

7. The apparatus as claimed in claim 6, in which the optical tracking system is configured to:

capture an image of the iris;

compare the image to a prior image of the iris to determine whether there has been a change in an iris position; and

compute deltas for the change in position from the image and the prior image;

and in which the control system is configured to shift delivery of the laser light based on the calculated deltas.

8. The apparatus as claimed in claim 6 or claim 7, in which the optical tracking system includes a rangefinder and is configured to determine, utilizing the rangefinder, a distance between the iris and a reference component of the optical tracking system.

9. The apparatus as claimed in claim 8, in which the rangefinder is a time-domain optical coherence tomography system or a spectral domain optical coherence tomography system or comprises one or more of: triangulation lasers, time of flight detectors, phase shift detectors, ultrasonic detectors, frequency modulation detectors, interferometers, a camera, or a light sensor.

10. The apparatus as claimed in claim 8 or claim 9, in which the control system is configured to autofocus the laser system in response to the distance.

11. A method of altering eye color of a patient, the method comprising:

delivering laser light to stromal pigment in an iris of an eye of the patient while imaging or acoustically monitoring an anterior surface of the iris to detect microbubbles; and

controlling delivery of the laser light based on detection of the microbubbles.

12. The method as claimed in claim 11, further comprising:

determining a laser power to deliver to the stromal pigment by at least retrieving a set of laser criteria for delivery of an exposure less than 100 times a maximum permissible exposure that causes elimination of at least a portion of the stromal pigment; and

delivering laser light at the laser power which is less than the set of laser criteria.

13. The method as claimed in claim 11 or claim 12, further comprising:

imaging the iris with an image sensor prior to the procedure to generate a plurality of images of the iris;

analyzing the images with image processing software;

generating, based on the image analysis, a mapping of the iris, the mapping comprising a plurality of regions corresponding to varying absorption coefficients of a treatment wavelength of the stromal pigment of the iris; and

setting, based on the mapping, the laser system to deliver laser light at a first laser power to a location in the eye of the patient, wherein the first laser power is sufficient to cause elimination of at least a portion of stromal pigment in the iris.

14. The method as claimed in any of claims 11 to 13, further comprising:

determining stages of delivery of laser power to the iris such that successive stages cause removal of less pigment but are delivered at a higher laser power; and

delivering the laser light at a power based on a current stage of delivery.

15. The method as claimed in any of claims 11 to 14, further comprising:

determining an immune response level of a patient based on accessing, by a control computer;

obtaining a medical record of the patient containing data representative of the immune response level;

comparing the immune response level to a range of immune responses associated with a time interval between two of the stages; and

reducing the time interval based on the comparing showing that the immune response level is higher than the range.