CLAIMS

1. A system for treating glaucoma of an eye, the system comprising:

a processor configured with instructions to:

receive input corresponding to a plurality of locations of a Schlemm's canal of the eye, and

generate a plurality of treatment locations for the eye in response to the plurality of locations, in which the plurality of treatment locations is located within 2 mm of the Schlemm's canal, and located radially inward from the Schlemm's canal toward an optical axis of the eye and radially outward from the Schlemm's away from the optical axis of the eye;

an energy source configured to generate energy to treat the eye; and

a scanner operably coupled to the energy source and the processor, the scanner configured to deliver the energy to the plurality of treatment locations in order to stretch the Schlemm's canal of the eye.

2. A system according to Claim 1, in which the plurality of treatment locations comprise juxtacanalicular locations located within 2 mm of the Schlemm's canal and in which the plurality of treatment locations extend in a first annular treatment pattern on a first side of the Schlemm's canal and a second annular treatment pattern on a second side of Schlemm's canal opposite the first side in order stretch tissue between the first annular treatment pattern and the second annular treatment pattern to dilate the Schlemm's canal and increase porosity of a trabecular meshwork of the eye.

3. A system according to Claim 2, in which the first annular treatment pattern is located radially inward from Schlemm's canal and the second annular treatment pattern is located radially outward from Schlemm's canal relative to the optical axis of the eye.

4. A system according to Claim 2, in which the processor is configured with instructions to shrink tissue with the first annular treatment pattern prior to shrinking tissue with the second annular treatment pattern.

5. A system according to Claim 2, in which the processor is configured with instructions to shrink tissue with at least a portion of the first annular treatment pattern prior to shrinking tissue with at least a portion of the second annular treatment pattern.

6. A system according to Claim 2, in which the first annular treatment pattern comprises a first plurality of spaced apart annular treatment patterns and the second annular treatment pattern comprises a second plurality of spaced apart annular treatment patterns.

7. A system according to Claim 6, in which the first plurality of spaced apart treatment annular treatment patterns comprises angularly separated spaced apart treatment patterns and the second plurality of annular treatment pattern comprises angularly separated spaced apart treatment patterns.

8. A system according to Claim 6, in which the first plurality of spaced apart treatment annular treatment patterns comprises radially separated spaced apart treatment patterns and the second plurality of annular treatment pattern comprises radially separated spaced apart treatment patterns.

9. A system according to Claim 2, in which the processor is configured with instructions to configured repeatedly deliver the energy to each the plurality of treatment locations with a time delay in order to fractionate delivery of energy to each of the plurality of treatment locations.

10. A system according to Claim 9, in which the time delay is within a range from about 10 millisecond (ms) to about 60 seconds and optionally in which the time delay is within a range from about 100 ms to about 30 seconds and optionally within a range from about 500 ms to about 15 seconds and optionally within a range from about 1 second (s) to about 10 seconds.

11. A system according to Claim 2, in which the processor coupled to the energy source and the scanner is configured with instructions to heat tissue at the plurality of treatment locations to a temperature within a range from 60 to 70 degrees Centigrade at a depth within a range from 50 to 400 microns at each of the plurality of treatment locations along the first annular pattern and the second annular pattern.

12. A system according to Claim 11, in which a majority of a treatment energy of the first treatment pattern is located within 1.5 mm of the Schlemm’s canal and a majority of treatment energy of the second pattern is located within 1.5 mm of Schlemm’s canal.

13. A system according to Claim 12, in which the first annular treatment pattern and the second annular treatment pattern are configured to open an angle of the eye by an amount within a range from 1 to 6 degrees.

14. A system according to Claim 13, in which the first annular treatment pattern extends at least about 30 degrees around the optical axis of the eye and the second annular treatment pattern extends at least about 30 degrees around the optical axis of the eye.

15. A system according to Claim 14, in which the first treatment annular treatment pattern extends at least about 40 degrees around the optical axis of the eye and the second treatment pattern extends at least about 40 degrees around the optical axis of the eye.

16. A system according to Claim 15, in which the first annular treatment pattern and the second annular treatment pattern may be arranged avoid heating tissue overlaying the Schlemm's canal.

17. A system according to Claim 16, in which the first annular treatment pattern and the second annular treatment pattern comprise circular, oval, elliptical, egg-like, non-circular, non-elliptical, or asymmetrical, shapes patterned so as to correspond to the shape of Schlemm's canal or the limbus.

18. A system according to Claim 17, in which the energy source comprises one or more of a pulsed laser, a continuous laser, a pulsed ultrasound transducer, a HIFU array, or a phased HIFU array.

19. A system according to Claim 1, in which the input comprises an input from a user of the system or an input from an imaging apparatus.

20. A system according to Claim 1, in which the processor is configured with instructions to generate vacuoles in a sclera of the eye.

21. A system according to Claim 20, in which the energy source comprises a laser having a wavelength within a range from about 1.9 to 2.3 microns.

22. A system according to Claim 20, in which the energy source comprises a laser having a wavelength of about 1.9 microns.

23. A system according to Claim 20, in which the processor is configured with instructions to scan laser beam with an annular pattern on the sclera.

24. A system according to Claim 23, in which the processor is configured with instructions to scan the sclera with two repetitions of the annular pattern.

25. A system according to Claim 1, in which the processor is configured with instructions to treat the eye in order to increase an angle of the eye, dilate and stretch one or more of the trabecular meshwork or Schlemm's canal, increasing porosity of the sclera and dilating the perilimibic sclera, dilate collector channels, or dilate ostia of collector channels of the eye.

26. A system for treating an eye, the system comprising:

a processor configured with instructions to:

estimate a plurality of locations of a Schlemm's canal of the eye, and

generate a plurality of treatment locations for the eye in response to the plurality of locations, in which the plurality of treatment location is located within 2 mm of the Schlemm's canal, and located radially inward from the Schlemm's canal toward an optical axis of the eye or radially outward from the Schlemm's away from the optical axis of the eye as measured along an exterior surface of the eye,

an energy source configured to generate energy for treating the eye; and

a scanner operably coupled to the energy source and the processor, the scanner configured to deliver the energy to the plurality of treatment locations.

27. A system for treating glaucoma of an eye, the system comprising:

a processor configured with instructions to:

generate a plurality of treatment locations for the eye, in which the plurality of treatment location is located within 2 mm of the Schlemm's canal, and located radially inward from the Schlemm's canal toward an optical axis of the eye and radially outward from the Schlemm's away from the optical axis of the eye;

an energy source configured to generate energy to treat the eye; and

a scanner operably coupled to the energy source and the processor, the scanner configured to deliver the energy to the plurality of treatment locations in order to stretch the Schlemm's canal of the eye.