CLAIMS

1. An apparatus, comprising:

(a) a body;

(b) a cannula extending distally from the body, wherein the cannula is flexible, wherein the cannula includes a distal end that is configured to provide separation between sclera and choroid layers of a patient's eye to enable the cannula to be advanced between the sclera and the choroid layers without inflicting trauma to the sclera or choroid layers; and

(c) a needle slidably disposed in the cannula, wherein the needle includes:

(i) a sharp distal tip, wherein the needle is configured to translate relative to the cannula between a proximal position and a distal position, wherein the distal tip is configured to be positioned inside the cannula when the needle is in the proximal position, wherein the distal tip is configured to be positioned outside the cannula when the needle is in the distal position;

(ii) a curved portion, wherein the needle is resiliently biased to extend along a curve through the curved portion;

(iii) a straight proximal portion; and

(iv) a straight distal portion, wherein the curved portion is longitudinally positioned between the straight proximal portion and the straight distal portion.

2. The apparatus of claim 1, wherein:

(i) the distal end of the cannula is a closed distal end, and wherein the cannula further includes:

(ii) a lateral opening located proximal to the closed distal end.

3. The apparatus of claim 2, wherein the cannula further includes a ramp feature, wherein the ramp feature extends from an interior region of the cannula to the lateral opening.

4. The apparatus of claim 1, wherein the curved portion is resiliently biased to define a constant radius of curvature.

5. The apparatus of claim 4, wherein the radius of curvature is between approximately 7 mm and approximately 12 mm, more preferably between approximately 4 mm and approximately 15 mm, and more preferably between approximately 9 mm and approximately 10 mm.

6. The apparatus of claim 1, wherein the curved portion is configured to position the distal tip at a progressively increasing exit angle relative to a longitudinal axis of the cannula, based on a distance to which the needle is advanced distally relative to the cannula.

7. The apparatus of claim 1, wherein the curved portion comprises a first curved region and a second curved region, wherein the first curved region is located near a distal portion of the needle, wherein the second curved region is located proximal to the first curved region.

8. The apparatus of claim 7, wherein the first curved region has a first radius of curvature, wherein the second curved region has a second radius of curvature, wherein the second radius of curvature is greater than the first radius of curvature.

9. The apparatus of claim 7, wherein the first curved region is configured to not impart a curvature to the cannula, wherein the second curved region is configured to impart a curvature to the cannula.

10. The apparatus of claim 1, wherein the distal end of the cannula is an open distal end, wherein the needle is configured to protrude from the open distal end of the cannula when the needle is in the distal position.

11. The apparatus of claim 1, further comprising a source of liquid therapeutic agent, wherein the needle is operable to deliver the liquid therapeutic agent.

12. The apparatus of claim 11, wherein the body includes:

(i) a needle actuator, wherein the actuator is operable to drive the needle longitudinally relative to the cannula, and

(ii) a valve member, wherein the valve member is operable to selectively provide fluid communication from the source of liquid therapeutic agent to the needle.

13. The apparatus of claim 2, wherein the distal tip of the needle is configured to extend past the lateral opening when the needle is in the distal position, and the curved portion of the needle is configured to provide an oblique exit angle to a portion of the needle extending past the lateral opening when the needle is in the distal position.

14. The apparatus of claim 13, wherein the curved portion is further configured to deform to a substantially straight configuration within the cannula when the needle is in the proximal position.

15. The apparatus of claim 1, wherein the cannula is flexible enough to conform to contours of the sclera and choroid, and has sufficient column strength to be advanced between the sclera and choroid without buckling.