

CLAIMS

1. An intraocular injection device, comprising:
 - 1) an intracameral injector needle comprising:
 - a substantially cylindrical body defining a longitudinal flow path therein, the body including a proximal end, a distal end, an outer peripheral face and a bevel region, the longitudinal flow path extending from the proximal end to the distal end,
 - a first bevel of the bevel region having a first bevel angle with respect to the outer peripheral face; and
 - a second bevel of the bevel region extending from the first bevel to the proximal end, the second bevel: (1) including a tip of the intracameral injector needle, and (2) having a second bevel angle with respect to the outer peripheral face, the second bevel angle different from the first bevel angle,
 - the first bevel and the second bevel defining a transition therebetween,
 - the bevel region having a tapered width, and
 - the transition longitudinally positioned between the tip of the intracameral injector needle and a location of a maximum width of the bevel region;
 - 2) a cap having a proximal end, a distal end, and a longitudinal axis, the cap including a bristle retainer at least partially disposed therewithin at the distal end thereof, the bristle retainer having a bristle at least partially disposed therewithin;
 - 3) a needle hub at least partially disposed within the cap;
 - 4) the intracameral injector needle disposed within a hub pocket of the needle hub;
 - 5) an applicator connected to the needle hub; and
 - 6) at least one implant disposed within the intracameral injector needle, the intracameral injector needle and the at least one implant substantially aligned with one another along the longitudinal axis of the cap.
2. The intraocular injection device of claim 1, wherein the first bevel angle with respect to the outer peripheral face is between 7.5 degrees and 11.5 degrees.
3. The intraocular injection device of claim 2, wherein the first bevel angle with respect to the outer peripheral face is 9.5 degrees.

4. The intraocular injection device of claim 1, wherein the second bevel angle with respect to the outer peripheral face is between 18 degrees and 22 degrees.
5. The intraocular injection device of claim 1, wherein the second bevel angle with respect to the outer peripheral face is 20 degrees.
6. The intraocular injection device of claim 1, wherein the transition is positioned one of less than 500 μm and greater than 600 μm from the tip of the intracameral injector needle.
7. An intraocular injection device, comprising:
 - 1) an intracameral injector needle comprising:
 - a substantially cylindrical body defining a longitudinal flow path therein, the body including a proximal end, a distal end, an outer peripheral face and a bevel region, the longitudinal flow path extending from the proximal end to the distal end,
 - a first bevel of the bevel region having a first bevel angle with respect to the outer peripheral face; and
 - a second bevel of the bevel region extending from the first bevel, the second bevel:
 - (1) including a tip of the intracameral injector needle, and (2) having a second bevel angle with respect to the outer peripheral face, the second bevel angle different from the first bevel angle,
 - the first bevel and the second bevel defining a transition therebetween,
 - the bevel region having a tapered height, and
 - the transition vertically disposed at a position below 50% of a maximum height of the bevel region;
 - 2) a cap having a proximal end, a distal end, and a longitudinal axis, the cap including a bristle retainer at least partially disposed therewithin at the distal end thereof, the bristle retainer having a bristle at least partially disposed therewithin;
 - 3) a needle hub at least partially disposed within the cap;
 - 4) the intracameral injector needle disposed within a hub pocket of the needle hub;
 - 5) an applicator connected to the needle hub; and
 - 6) at least one implant disposed within the intracameral injector needle, the intracameral injector needle and the at least one implant substantially aligned with one another along the longitudinal axis of the cap.

8. The intraocular injection device of claim 7, wherein the first bevel angle with respect to the outer peripheral face is between 7.5 degrees and 11.5 degrees.
9. The intraocular injection device of claim 8, wherein the first bevel angle with respect to the outer peripheral face is 9.5 degrees.
10. The intraocular injection device of claim 7, wherein the second bevel angle with respect to the outer peripheral face is between 18 degrees and 22 degrees.
11. The intraocular injection device of claim 10, wherein the second bevel angle with respect to the outer peripheral face is 20 degrees.
12. The intraocular injection device of claim 7, wherein the transition is positioned one of less than 500 μm and greater than 600 μm from the tip of the intracameral injector needle.
13. An intraocular injection device for use in the administration of an implant to a patient, wherein:
 - the device includes a preloaded needle hub assembly and an applicator handle, the preloaded needle hub assembly including: an intracameral injector needle, an implant, and a bristle disposed within a bristle retainer;
 - force is to be applied to the intracameral injector needle to penetrate a biological membrane; and
 - the applicator handle is to be actuated such that the implant is linearly advanced through the intracameral injector needle; and
 - the intracameral injector needle comprises:
 - a substantially cylindrical body defining a longitudinal flow path therein, the body including a proximal end, a distal end, an outer peripheral face and a bevel region, the longitudinal flow path extending from the proximal end to the distal end,
 - a first bevel of the bevel region having a first bevel angle with respect to the outer peripheral face; and
 - a second bevel of the bevel region extending from the first bevel to the proximal end, the second bevel: (1) including a tip of the intracameral injector needle, and (2) having a second bevel angle with respect to the outer peripheral face, the second bevel angle different from the first bevel angle,

the first bevel and the second bevel defining a transition therebetween,
the bevel region having a tapered width, and
the transition longitudinally positioned between the tip of the intracameral injector needle and a location of a maximum width of the bevel region.

14. An intraocular injection device for use in the administration of an implant to a patient, wherein:

the device includes a preloaded needle hub assembly and an applicator handle, the preloaded needle hub assembly including: an intracameral injector needle, an implant, and a bristle disposed within a bristle retainer;

force is to be applied to the intracameral injector needle to penetrate a biological membrane;

the applicator handle is to be actuated such that the implant is linearly advanced through the intracameral injector needle; and

the intracameral injector needle comprises:

a substantially cylindrical body defining a longitudinal flow path therein, the body including a proximal end, a distal end, an outer peripheral face and a bevel region, the longitudinal flow path extending from the proximal end to the distal end,

a first bevel of the bevel region having a first bevel angle with respect to the outer peripheral face; and

a second bevel of the bevel region extending from the first bevel, the second bevel: (1) including a tip of the intracameral injector needle, and (2) having a second bevel angle with respect to the outer peripheral face, the second bevel angle different from the first bevel angle,

the first bevel and the second bevel defining a transition therebetween,

the bevel region having a tapered height, and

the transition vertically disposed at a position below 50% of a maximum height of the bevel region.

15. The intraocular injection device of claim 13 or 14, wherein the first bevel angle with respect to the outer peripheral face is between 7.5 degrees and 11.5 degrees.

16. The intraocular injection device of claim 15, wherein the first bevel angle with respect to the outer peripheral face is 9.5 degrees.

17. The intraocular injection device of claim 13 or 14, wherein the second bevel angle with respect to the outer peripheral face is between 18 degrees and 22 degrees.

18. The intraocular injection device of claim 17, wherein the second bevel angle with respect to the outer peripheral face is 20 degrees.

19. The intraocular injection device of claim 13 or 14, wherein the transition is positioned one of less than 500 μm and greater than 600 μm from the tip of the intracameral injector needle.

20. The intraocular injection device of claim 13 or 14, further comprising: a cap having a proximal end, a distal end, and a longitudinal axis, the cap including a bristle retainer at least partially disposed therewithin at the distal end thereof, the bristle retainer having a bristle at least partially disposed therewithin; a needle hub at least partially disposed within the cap; the intracameral injector needle disposed within a hub pocket of the needle hub; an applicator connected to the needle hub; and at least one implant disposed within the intracameral injector needle, the intracameral injector needle and the at least one implant substantially aligned with one another along the longitudinal axis of the cap.