CLAIMS

What is claimed is:

1. An injector comprising:

a housing;

a push rod disposed at least partially within the housing;

a magazine tube disposed within the housing and having an inlet, an outlet, and a lumen extending from the inlet to the outlet, the magazine tube configured to slidingly receive at least one implant therein, wherein the push rod is configured to be slidingly received within the lumen of the magazine tube;

a gate disposed within the housing, wherein the gate has a closed configuration in which it covers the outlet of the magazine tube and an open configuration in which it does not cover the outlet of the magazine tube;

a cannula having a distal end that is disposed outside of the housing and is configured to be inserted into an eye, wherein a lumen of the cannula is in fluid communication with the lumen of the magazine tube when the gate is in the open configuration; and

an actuator, wherein actuation of the actuator moves the gate from the closed configuration to the open configuration and causes translation of the pushrod through the magazine tube and the cannula.

2. The injector of claim 1, further comprising a safety cap that is configured to be removably coupled to the housing to cover the distal end of the cannula when the safety cap is coupled to the housing, wherein the safety cap includes a tab that extends into a slot formed in the actuator when the safety cap is coupled to the housing to prevent actuation of the actuator.

3. The injector of claim 1, wherein the housing has a generally tubular construction with an asymmetrical fin that includes a height that is greater than a height of the remaining length of the housing.

4. The injector of claim 1, wherein the distal end of the cannula is beveled.

5. The injector of claim 1, wherein the push rod is attached to a shuttle body that is slidingly disposed within the housing and the shuttle body is coupled to a spring, the spring including a non-extended configuration and an extended configuration and being biased to the non-extended configuration.

6. The injector of claim 5, wherein the spring is coiled in the non-extended configuration.

7. The injector of claim 5, wherein the actuator in a non-deployed position holds the shuttle body such that the spring is in the extended configuration.

8. The injector of claim 7, wherein actuation of the actuator from the non-deployed position to a deployed position releases the shuttle body and permits the spring to resume the non-extended configuration.

9. The injector of claim 8, wherein when the actuator is in the non-deployed position, the actuator contacts and engages the shuttle body and when the actuator is in the deployed position, the actuator does not contact the shuttle body and is disengaged therefrom.

10. The injector of claim 8, wherein the actuator is configured to rotate relative to the shuttle body to transition between the non-deployed position and the deployed position.

11. The injector of claim 1, wherein the magazine tube is configured to hold up to three implants and the injector is configured to deliver the three implants via a single actuation of the actuator.

12. The injector of claim 1, wherein the cannula and the magazine tube are coaxially aligned and a transition gap extends between the outlet of the magazine tube and an inlet of the cannula and wherein a portion of the gate is disposed within the transition gap when the gate is in the closed configuration and wherein the portion of the gate is not disposed within the transition gap when the gate is in the open configuration.

13. The injector of claim 1, wherein the housing includes a window formed thereon to permit visual feedback relating to the translation of the pushrod and wherein the push rod is attached to a shuttle body that is slidingly disposed within the housing and an outer surface of the shuttle body includes a status indicator thereon for providing the visual feedback through the window.

14. The injector of claim 1, wherein the push rod is attached to a shuttle body that is slidingly disposed within the housing, and wherein a drag wire is attached to the shuttle body, and wherein the injector further includes a shuttle decelerator disposed within the housing, the shuttle decelerator being configured to receive the drag wire within a sinusoidal path thereof.

15. The injector of claim 14, wherein the sinusoidal path of the shuttle decelerator is defined by a plurality of bosses and interaction between the drag wire and the plurality of bosses creates friction that slows down translation of the shuttle body and push rod attached thereto.

16. The injector of claim 1, further comprising the at least one implant, wherein the at least one implant contains vorolanib or a pharmaceutically acceptable salt thereof.

17. An injector comprising:

a housing;

a push rod disposed at least partially within the housing;

a magazine tube disposed within the housing and having an inlet, an outlet, and a lumen extending from the inlet to the outlet, the magazine tube configured to slidingly receive at least one implant therein, wherein the push rod is configured to be slidingly received within the lumen of the magazine tube;

a cannula having a distal end that is disposed outside of the housing and is configured to be inserted into an eye; and

an actuator, wherein actuation of the actuator causes translation of the pushrod through the magazine tube and the cannula, wherein the magazine tube is configured to hold at least three implants and the injector is configured to deliver the at least three implants via a single actuation of the actuator, and

wherein a speed of delivery of the at least three implants is controlled such that the speed of delivery is between 2 and 12 seconds.

18. The injector of claim 17, further comprising a gate disposed within the housing, wherein the gate has a closed configuration in which it covers the outlet of the magazine tube and an open configuration in which it does not cover the outlet of the magazine tube,

wherein a lumen of the cannula is in fluid communication with the lumen of the magazine tube when the gate is in the open configuration, and

wherein actuation of the actuator also moves the gate from the closed configuration to the open configuration.

19. The injector of claim 18, wherein the cannula and the magazine tube are coaxially aligned and a transition gap extends between the outlet of the magazine tube and an inlet of the cannula.

20. The injector of claim 19, wherein a portion of the gate is disposed within the transition gap when the gate is in the closed configuration and wherein the portion of the gate is not disposed within the transition gap when the gate is in the open configuration.

21. The injector of claim 17, wherein the push rod is attached to a shuttle body that is slidingly disposed within the housing and the shuttle body is coupled to a spring, the spring including a non-extended configuration and an extended configuration and being biased to the non-extended configuration.

22. The injector of claim 21, wherein the spring is coiled in the non-extended configuration.

23. The injector of claim 21, wherein the actuator in a non-deployed position holds the shuttle body such that the spring is in the extended configuration.

24. The injector of claim 23, wherein actuation of the actuator from the non-deployed position to a deployed position releases the shuttle body and permits the spring to resume the non-extended configuration.

25. The injector of claim 24, wherein when the actuator is in the non-deployed position, the actuator contacts and engages the shuttle body and when the actuator is in the deployed position, the actuator does not contact the shuttle body and is disengaged therefrom.

26. The injector of claim 24, wherein the actuator is configured to rotate relative to the shuttle body to transition between the non-deployed position and the deployed position.

27. The injector of claim 17, wherein the speed of delivery of the at least three implants is controlled such that the speed of delivery is between 3 and 10 seconds.

28. The injector of claim 17, wherein the speed of delivery of the at least three implants is controlled such that the speed of delivery is between 5 and 7 seconds.

29. The injector of claim 13, wherein the at least one status indicator includes a first status indicator and a second status indicator, the first status indicator being disposed proximal to the second status indicator, and wherein the first status indicator is displayed through the window prior to actuation of the actuator and the second status indicator is displayed through the window when the delivery of the at least one implant is complete.

30. The injector of claim 13, wherein the at least one status indicator further includes a third status indicator disposed between the first status indicator and the second status indicator, and wherein the second status indicator is disposed through the window while the shuttle body is moving within the housing.

31. The injector of claim 13, wherein the first status indicator is a first color, the second status indicator is a second color, and the third status indicator is a third color.

32. The injector of claim 1, wherein the injector further includes a rotary damper disposed within the housing, the rotary damper being coupled to the push rod and configured to slow down the rate at which the push rod moves within the housing.

33. The injector of claim 32, wherein the push rod is attached to a shuttle body that is slidingly disposed within the housing and the shuttle body is coupled to a spring, and wherein the spring has a spring constant for load of 0.5 pounds of force (0.5 Ibf), the rotary damper has a damping torque of 0.035 in-lbs, and the injector has an injection speed of between 4 and 9 seconds, or wherein the spring has a spring constant for load of 0.4 pounds of force (0.4 Ibf), the rotary damper has a damping torque of 0.026 in-lbs, and the injector has an injection speed of between 2.5 and 7.5 seconds, or wherein the spring has a spring constant for load of 0.5 pounds of force (0.5 Ibf), the rotary damper has a damping torque of 0.026 in-lbs, and the injector has an injection speed of between 1.5 and 6.5 seconds.