CLAIMS

1. A system, comprising:

a syringe barrel comprising a proximal end and a distal end;

a floating seal in the syringe barrel;

a needle base proximal to the floating seal, wherein the floating seal and the needle base are configured to elastically engage each other; and

a needle comprising a needle proximal end engaging the needle base and a needle distal end, wherein the needle comprises:

(i) a needle distal opening,

(ii) a needle body opening between the needle proximal end and the needle distal end, wherein the needle body opening is proximal to the needle distal opening, and

(iii) a needle body passageway connecting the needle distal opening and the needle body opening,

wherein the needle base is configured to advance the needle distally toward and/or through the floating seal.

2. The system of claim 1, wherein the floating seal separates a proximal lumen and a distal lumen in the syringe barrel and the distal lumen comprises a flowable composition, and/or

wherein prior to advancement of the needle, the needle body opening and the needle distal opening are proximal to the floating seal, optionally wherein the needle body opening and the needle distal opening are in the proximal lumen.

3. The system of claim 1 or claim 2, wherein the needle base is configured to advance the needle distally toward the floating seal, optionally wherein the needle is advanced through the proximal lumen;

optionally wherein the needle base is configured to advance the needle further distally through the floating seal, optionally wherein the needle body opening is in the proximal lumen while the needle distal opening is in the distal lumen;

optionally wherein advancement of the needle through the floating seal comprises puncturing the floating seal with the needle distal end, optionally wherein the floating seal comprises a guiding groove that aligns with the needle to facilitate the puncturing;

optionally wherein advancement of the needle through the floating seal comprises advancing the needle distal end through an existing aperture or slit in the floating seal.

4. The system of any of claims 1-3, wherein the needle base is configured to advance the needle distally such that both the needle body opening and the needle distal opening are distal to the floating seal, optionally wherein the needle body opening and the needle distal opening are in the distal lumen;

optionally wherein the needle base is configured to advance the needle distally through the distal lumen such that the needle body opening is in the distal lumen while the needle distal opening is outside the distal lumen;

optionally wherein when the needle distal opening is outside the distal lumen, the needle distal opening contacts a distal seal of the syringe barrel;

optionally wherein when the needle distal opening is outside the distal lumen, the needle distal opening contacts a contacting element at the distal end of the syringe barrel, optionally wherein the contacting element is distal to the distal seal and is configured to contact a subject;

optionally wherein the distal seal and/or the contacting element are configured to prevent discharge of the flowable composition in the distal lumen through the needle distal opening.

5. The system of any of claims 1-4, wherein the needle base is configured to advance the needle distally such that the needle distal opening is in a first tissue of a subject, optionally wherein the needle body opening is in the distal lumen;

optionally wherein the first tissue is capable of preventing discharge of the flowable composition in the distal lumen through the needle distal opening;

optionally wherein the distal lumen is in fluidic communication with the needle distal opening through the needle body opening and the needle body passageway;

optionally wherein the needle base is configured to advance the needle distally such that the needle body opening is in the distal lumen while the needle distal opening is in a second tissue distal to the first tissue of the subject;

optionally wherein the needle distal opening is in an apparent or potential tissue void, cavity, or vessel of the second tissue;

optionally wherein pressure at the needle distal opening in the second tissue is lower than pressure at the needle distal opening in the first tissue;

optionally wherein pressure at the needle distal opening in the second tissue is lower than pressure at the needle body opening in the distal lumen;

optionally wherein the floating seal is configured to move distally due to the elastic engagement, without moving the needle base or the needle distally, optionally wherein the elastic engagement comprises one or more springs and/or one or more elastic sheaths;

optionally wherein the flowable composition in the distal lumen is discharged through the needle distal opening into the second tissue or a void formed therein or between the first and second tissues;

optionally wherein the first tissue is a sclera, the second tissue is a choroid/ciliary body, and/or the void is a suprachoroidal space;

optionally wherein the flowable composition comprises a liquid, a solution, a suspension, a gel, an oil, an ointment, an emulsion, a cream, a foam, a lotion, and/or a paste;

optionally wherein the space between the floating seal and the needle base does not comprise the flowable composition.

6. The system of any of claims 1-5, wherein the space between the floating seal and the needle base is filled with a gas such as sterilized air;

optionally wherein the needle, when in the space between the floating seal and the needle base, is covered by an elastic sheath.

7. The system of any of claims 1-6, wherein the system further comprises a linear member configured to advance distally through the needle and be exposed at a distal end of the needle,

optionally wherein the linear member comprises a wire, a tube, or any combination thereof, optionally wherein the linear member is selected from the group consisting of a guidewire, a sheath, a catheter, a cannula, a microneedle, an electrode, and a sensor; and/or

wherein the system further comprises a guiding member configured to guide the linear member toward, into and/or through the needle.

8. The system of any of claims 1-7, wherein at least one component of the system is separately provided from one or more other components;

optionally wherein two or more components of the system are made as one piece or preassembled.

9. A device, comprising:

a syringe barrel comprising a proximal open end and a distal closed end;

an actuation unit in the syringe barrel, wherein the actuation unit comprises a needle base and a floating seal elastically engaging each other, and wherein the needle base is proximal to the floating seal;

a needle comprising a needle proximal end engaging the needle base and a needle distal end, wherein the needle comprises:

(i) a needle distal opening,

(ii) a needle body opening between the needle proximal end and the needle distal end, wherein the needle body opening is proximal to the needle distal opening, and

(iii) a needle body passageway connecting the needle distal opening and the needle body opening; and

a flowable composition lumen distal to the floating seal,

wherein the actuation unit is configured to advance the needle to place the needle proximal end and/or the needle distal end in the flowable composition lumen;

optionally wherein the flowable composition lumen comprises a flowable composition selected from the group consisting of a liquid, a solution, a suspension, a gel, an oil, an ointment, an emulsion, a cream, a foam, a lotion, a paste, and any combination thereof;

optionally wherein the space in the syringe barrel between the floating seal and the needle base is filled with a gas such as sterilized air.

10. The device of claim 9, wherein the needle base engages an actuation member (e.g., pressing element) on the proximal open end of the syringe barrel, wherein the actuation member (e.g., pressing element) is configured to advance the needle base and the needle distally; and/or

wherein the actuation unit comprises an energy storage member elastically engaging the needle base and the floating seal,

optionally wherein the energy storage member is a first energy storage member, the actuation unit further comprises a second energy storage member elastically engaging a slider and the floating seal, and a portion of the slider extends outside the syringe barrel,

optionally wherein the energy storage member comprises a spring and/or an elastic sheath,

optionally wherein the energy storage member is fixed to the needle base and/or the

floating seal,

optionally wherein the energy storage member is releasably connected to the needle base and/or the floating seal,

optionally wherein the energy storage member is configured to exert a force on the floating seal which in turn exerts a force on a flowable composition in the flowable composition lumen,

optionally wherein the energy storage member is configured to move the floating seal distally without moving the needle base or the needle, and/or

wherein the device comprises a sheath configured to enclose all or a portion of the needle,

optionally wherein the sheath is configured to enclose the needle distal opening and/or the needle body opening, optionally wherein the sheath is configured to seal the needle body opening when enclosing the needle body opening; and/or

wherein the device comprises a stopper in the flowable composition lumen, wherein the stopper is configured to stop the floating seal from moving distally,

optionally wherein the stopper is provided on an inner wall of the syringe barrel enclosing the flowable composition lumen; and/or

wherein the device comprises a distal seal at the distal closed end of the syringe barrel,

optionally wherein the flowing seal, the syringe barrel, and the distal seal enclose the flowable composition lumen; and/or

wherein the device comprises a contacting element at the distal closed end of the syringe barrel; and/or

wherein the device comprises a guiding structure configured to guide a linear member toward, into and/or through the needle;

optionally wherein the guiding structure comprises an angled guiding groove on the floating seal;

optionally wherein the guiding structure comprises a valve and/or a removable plug in the angled guiding groove, optionally wherein the valve is a one-way valve configured to open toward the needle; optionally wherein the angled guiding groove extends from a proximal surface of the floating seal to a distal surface of the floating seal; optionally wherein the angled guiding groove does not extend through the floating seal;

optionally wherein the device further comprises the linear member optionally selected from the group consisting of a guidewire, a sheath, a catheter, a cannula, a microneedle, an electrode, and a sensor.

11. A device, comprising:

(1) a first syringe unit comprising:

a first syringe barrel;

a needle base in the first syringe barrel; and

a needle comprising a needle proximal end engaging the needle base and a needle distal end, wherein the needle comprises:

(i) a needle distal opening,

(ii) a needle body opening between the needle proximal end and the needle distal end, wherein the needle body opening is proximal to the needle distal opening, and

(iii) a needle body passageway connecting the needle distal opening and the needle body opening;

(2) a second syringe unit engaging a distal end of the first syringe unit, comprising:

a second syringe barrel; and

a floating seal in the second syringe barrel,

wherein the floating seal elastically engages the needle base; and

(3) a third syringe unit engaging a distal end of the second syringe unit, comprising a third syringe barrel enclosing a flowable composition,

wherein the needle base is configured to advance the needle to place the needle proximal end and/or the needle distal end in the flowable composition,

optionally wherein the device further comprises one or more syringe units, optionally a fourth syringe unit engaging a distal end of the third syringe unit.

12. A device, comprising:

(1) a first syringe unit comprising:

a first syringe barrel;

a needle base and a floating seal in the first syringe barrel elastically engaging each other, wherein the needle base is proximal to the floating seal; and

a needle comprising a needle proximal end engaging the needle base and a needle distal end, wherein the needle comprises:

(i) a needle distal opening,

(ii) a needle body opening between the needle proximal end and the needle distal end, wherein the needle body opening is proximal to the needle distal opening, and

(iii) a needle body passageway connecting the needle distal opening and the needle body opening; and

(2) a second syringe unit engaging a distal end of the first syringe unit, comprising a second syringe barrel enclosing a flowable composition,

wherein the needle base is configured to advance the needle to place the needle proximal end and/or the needle distal end in the flowable composition,

optionally wherein the device further comprises one or more syringe units, optionally a third syringe unit engaging a distal end of the second syringe unit.

13. A device, comprising:

(1) a first syringe unit comprising:

a first syringe barrel;

a needle base in the first syringe barrel; and

a needle comprising a needle proximal end engaging the needle base and a needle distal end, wherein the needle comprises:

(i) a needle distal opening,

(ii) a needle body opening between the needle proximal end and the needle distal end, wherein the needle body opening is proximal to the needle distal opening, and

(iii) a needle body passageway connecting the needle distal opening and the needle body opening;

(2) a second syringe unit engaging a distal end of the first syringe unit, comprising:

a second syringe barrel;

a floating seal in the second syringe barrel, wherein the floating seal elastically engages the needle base; and

a flowable composition,

wherein the needle base is configured to advance the needle to place the needle proximal end and/or the needle distal end in the flowable composition,

optionally the device further comprises one or more syringe units, optionally a third syringe unit engaging a distal end of the second syringe unit.

14. The system of claim 1, wherein the system further comprises a piston rod configured to elastically engage the needle base,

wherein the piston rod is between the floating seal and the needle base,

wherein the needle is in the piston rod, and

wherein the needle base is configured to advance the needle distally through the piston rod and toward and/or through the floating seal;

optionally wherein the floating seal is fixedly attached to the distal end of the piston rod and forms a sliding and sealing engagement with an inner surface of the syringe barrel;

optionally wherein the needle base fixedly engages an actuation member (e.g., pressing element), and a spring engages the actuation member and the piston rod, thereby providing the elastic engagement between the needle base and the piston rod.

15. The system or device of any of the preceding claims, for use in placing the needle distal opening in a subject in need thereof.