# CLAIMS

*What is claimed is:*

1. A system comprising:

a flow cell flow path to be fluidically connected with a flow cell to support analytes of interest in an analysis system;

a fluidic system comprising a plurality of reagent flow paths, a further flow path, a mixing channel, and a selector valve, each of the plurality of reagent flow paths selectively in fluidic communication with a reagent recipient of a plurality of reagent recipients at a first end and in fluidic communication with the selector valve at a second end, the further flow path selectively in fluidic communication with a destination recipient at a first end and in fluidic communication with the selector valve at a second end, the mixing channel fluidically coupled at a first end to the selector valve, the fluidic system to aspirate reagents from the plurality of reagent recipients into the mixing channel via the selector valve, to eject the aspirated reagents from the plurality of reagent recipients from the mixing channel into the destination recipient via the selector valve, and to deliver the mixed reagents from the destination recipient to the flow cell flow path; and

a nozzle sipper in fluidic communication with the fluidic system, the nozzle sipper comprising an elongated body having a central lumen extending between ends thereof and a nozzle insert disposed in a distal end of the central lumen, wherein the nozzle sipper is to both aspirate the mixed reagents from the destination recipient and eject mixed reagents back into the destination recipient via the nozzle insert.

2. The system of claim 1, wherein the nozzle insert and lumen are dimensioned to promote vorticity mixing in the destination recipient when the reagents are expelled from the nozzle sipper through the nozzle insert and into the destination recipient.

3. The system of claim 1, wherein the lumen has a nominal inner diameter of about 0.5 mm and the nozzle insert is a tubular insert that has a nominal inner diameter of about 0.25 mm.

4. The system of claim 1, wherein the distal end of the nozzle sipper has a wedged shape with facets meeting at an apex that is offset with respect to a central axis of the nozzle sipper.

5. The system of claim 4, wherein the nozzle insert has a distal end that is shape-compliant with the wedged shape of the distal end of the nozzle sipper.

6. The system of claim 4, wherein the wedged shape comprises four facets meeting at the apex.

7. The system of claim 1, wherein nozzle sipper is to extend to a nominal distance of 2 mm from a bottom surface of the destination recipient.

8. The system of claim 1, comprising a plurality of other sippers for aspirating respective reagents, wherein the other sippers do not have nozzle inserts.

9. The system of claim 1, wherein the nozzle sipper is to accelerate the mixed recipients to a flow velocity of at least about 1600 mm/s at a flow rate of at least about 5,000 µL/min.

10. A system comprising:

a flow cell to support analytes of interest in an analysis system;

a fluidic system comprising a plurality of reagent flow paths, a further flow path, a mixing channel, and a selector valve, each of the plurality of reagent flow paths selectively in fluidic communication with a reagent recipient of a plurality of reagent recipients at a first end and in fluidic communication with the selector valve at a second end, the further flow path selectively in fluidic communication with a destination recipient at a first end and in fluidic communication with the selector valve at a second end, the mixing channel fluidically coupled at a first end to the selector valve, the fluidic system to aspirate reagents from the plurality of reagent recipients into the mixing channel via the selector valve, to eject the aspirated reagents from the plurality of reagent recipients from the mixing channel into the destination recipient, and to deliver the mixed reagents from the destination recipient to the flow cell;

a nozzle sipper in fluidic communication with the fluidic system, the nozzle sipper comprising an elongated body having a central lumen extending between ends thereof and a nozzle located at a distal end of the elongated body, wherein the nozzle reduces a nominal interior diameter of the central lumen; and

control circuitry operatively coupled to the fluidic system, the control circuitry to control the fluidic system to cause the fluidic system to:

aspirate a set of the reagents one-by-one into the mixing channel,

eject the reagents in the set of reagents into the destination recipient through the nozzle,

aspirate the set of reagents from the destination recipient through the nozzle for mixing, and

eject the set of mixed reagents back into the destination recipient through the nozzle.

11. The system of claim 10, wherein the nozzle comprises an insert inserted in the central lumen at the distal end of the nozzle sipper.

12. The system of claim 10, wherein the destination recipient contains an analyte to be sequenced.

13. The system of claim 10, wherein the central lumen has a nominal inner diameter of 0.5 mm and the nozzle has a nominal inner diameter of 0.25 mm.

14. The system of claim 10, wherein the distal end of the nozzle sipper has a wedged shape with facets meeting at an apex that is offset with respect to a central axis of the nozzle sipper.

15. The system of claim 14, wherein the nozzle has a distal end that is shape-compliant with the wedged shape of the distal end of the nozzle sipper.

16. A method comprising:

a) actuating a pump to aspirate, one-by-one, a plurality of reagents from a corresponding plurality of reagent recipients into a mixing channel;

b) actuating the pump to eject the reagents from the mixing channel into a destination recipient via a nozzle sipper in fluidic communication with the pump, the nozzle sipper comprising an elongated body having a central lumen extending between ends thereof and a nozzle located at a distal end of the elongated body, wherein the nozzle reduces a nominal interior diameter of the central lumen;

c) actuating the pump to aspirate the reagents from the destination recipient and through the nozzle sipper to further mix the reagents; and

d) actuating the pump to eject the reagents from the nozzle sipper and back into the destination recipient.

17. The method of claim 16, wherein the nozzle and lumen are dimensioned to promote vorticity mixing in the destination recipient when the reagents are expelled from the nozzle sipper through the nozzle and into the destination recipient.

18. The method of claim 16, wherein the central lumen has a nominal inner diameter of 0.5 mm and the nozzle comprises an insert that is inserted into the central lumen and that has a nominal inner diameter of 0.25 mm.

19. The method of claim 16, wherein the distal end of the nozzle sipper has a wedged shape with facets meeting at an apex that is offset with respect to a central axis of the nozzle sipper.

20. The method of claim 16, wherein the reagents comprise at least three reagents of different specific gravities.

21. The method of claim 16, further comprising performing one or more repetitions of (b) and (c) before performing (d).