CLAIMS

WHAT IS CLAIMED IS:

1. A method for dispensing a sample to a substrate, comprising: dispensing, via a sample dispenser, a sample solution comprising a plurality of beads onto said substrate in a path while said substrate and said sample dispenser are in relative motion, wherein said substrate comprises a plurality of individually addressable locations that receives and immobilizes said plurality of beads, wherein said plurality of individually addressable locations comprise: (i) a first individually addressable location of a first location type and (ii) a first individually addressable location of a second location type, wherein a bead of said plurality of beads has a higher affinity towards said first location type compared to said second location type, and wherein subsequent to said dispensing, said bead is immobilized at said first individually addressable location of said first location type, wherein said bead of said plurality of beads comprises nucleic acid molecules immobilized thereto.

2. The method of claim 1, wherein said substrate is substantially planar.

3. The method of claim 1, wherein said substrate is patterned.

4. The method of claim 3, wherein said substrate is patterned using surface chemistry.

5. The method of claim 1, wherein said path is in a substantially spiral pattern.

6. The method of claim 5, wherein said sample solution is dispensed onto said substrate in said substantially spiral pattern in a radially outward direction with respect to a central axis of said substrate.

7. The method of claim 5, wherein said sample solution is dispensed onto said substrate in said substantially spiral pattern in a radially inward direction with respect to an axis of rotation of said substrate.

8. The method of claim 5, wherein a path width of said path is greater than a path pitch of said path, wherein said path pitch is a distance between a center of said path at a first position and a center of said path at a second position after a single rotation of said substrate.

9. The method of claim 5, wherein a path width of said path is less than a path pitch of said path, wherein said path pitch is a distance between a center of said path at a first position and a center of said path at a second position after a single rotation of said substrate.

10. The method of claim 5, wherein a path width of said path is substantially the same as a path pitch of said path, wherein said path pitch is a distance between a center of said path at a first position and a center of said path at a second position after one rotation of said substrate.

11. The method of claim 1, wherein during said dispensing said sample dispenser is moving.

12. The method of claim 1, wherein during said dispensing said substrate is moving.

13. The method of claim 12, wherein during said dispensing (i) said substrate is rotating with respect to a rotational axis of said substrate and (ii) said sample dispenser is moving with respect to said rotational axis of said substrate or said substrate is moving such that said rotational axis of said substrate is moving with respect to said sample dispenser.

14. The method of claim 13, wherein said substrate is rotating at a rotational frequency of no more than 5 revolutions per minute (rpm).

15. The method of claim 1, wherein said plurality of beads comprises a first subset of beads and a second subset of beads, wherein said first subset of beads each comprises a respective template nucleic acid sequence coupled thereto, wherein said second subset of beads does not comprise template nucleic acid sequences coupled thereto.

16. The method of claim 15, wherein subsequent to said dispensing said first subset of beads is immobilized to individually addressable locations of said plurality of individually addressable locations and said second subset of beads is not immobilized to said plurality of individually addressable locations.

17. The method of claim 1, wherein said bead comprises a plurality of nucleic acid molecules having sequence identity.

18. The method of claim 1, wherein said plurality of individually addressable locations comprise at least 50,000,000,000 individually addressable locations.

19. The method of claim 1, wherein said substrate comprises a set of first locations and a set of second locations, wherein said set of first locations is of said first location type, and wherein said set of second locations is of said second location type, wherein said set of first locations and said set of second locations comprise said plurality of individually addressable locations.

20. The method of claim 19, wherein said first individually addressable location of said first location is not in contact with a second individually addressable location of said first location type.

21. The method of claim 20, wherein said set of first locations carries a positive electrostatic charge with affinity towards a negative electrostatic charge, wherein said bead comprises a nucleic acid molecule coupled thereto, which nucleic acid molecule carries said negative electrostatic charge.

22. The method of claim 21, wherein said set of first locations comprises (3-aminopropyl)triethoxysilane (APTMS) and wherein said second set of locations comprises hexamethyldisilazane (HMDS).