What is claimed is:

Claim 1. A method, comprising:

immobilizing a target material at each of two opposed sequencing surfaces of a flow cell, wherein the immobilizing involves:

introducing a first fluid, including a first portion of the target material therein, into the flow cell, whereby at least some of the target material becomes immobilized by capture sites on one of the two opposed sequencing surfaces;

removing the first fluid and any non-immobilized target material from the flow cell; and

introducing a second fluid, including a second portion of the target material therein, into the flow cell, whereby at least some of the target material becomes immobilized by capture sites on an other of the two opposed sequencing surfaces;

wherein one of:

the first fluid has a density less than a density of the target material and the second fluid has a density greater than the density of the target material; or

the second fluid has the density less than the density of the target material and the first fluid has the density greater than the density of the target material;and wherein

the first or second fluid having the density less than the density of the target material is an aqueous buffer solution, and

the second or first fluid having the density greater than the density of the target material is a sodium polytungstate solution or a sodium chloride solution.

Claim 2. The method as defined in claim 1, wherein the density of the first or second fluid at a capture temperature is at least 0.1 g/cm3 less than the density of the target material at the capture temperature, and wherein the density of the second or first fluid at the capture temperature is at least 0.1 g/cm3 greater than the density of the target material at the capture temperature.

Claim 3. The method as defined in one of claims 1 or 2, wherein the density of the first or second fluid that is less than the density of the target material is about 1 g/cm3 at a capture temperature, and wherein the density of the second or first fluid that is greater than the density of the target material is about 2 g/cm3 at the capture temperature.

Claim 4. The method as defined in one of claims 1 through 3, further comprising allowing a predetermined time to pass before removing the first fluid and any non-immobilized target material from the flow cell.

Claim 5. The method as defined in one of claims 1 through 4, wherein the target material immobilized on the one of the two opposed sequencing surfaces remains immobilized on the one of the two opposed sequencing surfaces when the second fluid is introduced.

Claim 6. The method as defined in one of claims 1 through 5, wherein the target material is a complex including:

a solid support; and

sequencing-ready nucleic acid fragments attached to the solid support.

Claim 7. The method as defined in claim 6, further comprising:

removing the second liquid and non-immobilized complexes from the flow cell;

initiating release of the sequencing-ready nucleic acid fragments from the solid support of immobilized complexes, thereby seeding at least some the sequencing-ready nucleic acid fragments to respective primers of the two opposed sequencing surfaces;

removing the solid support and non-seeded sequencing-ready nucleic acid fragments;

introducing an amplification mix including a liquid form of a temperature responsive material to the flow cell;

causing the liquid form of the temperature responsive material to gel;

initiating amplification of the seeded sequencing-ready nucleic acid fragments to generate template strands, whereby the gel form of the temperature responsive material reduces diffusion of the template strands;

causing the gel form of the temperature responsive material to liquify; and

removing the liquid form of the temperature responsive material from the flow cell.

Claim 8. The method as defined in claim 7, wherein the temperature responsive material is a copolymer of poly(N-isopropylacrylamide) and polyethylene glycol.

Claim 9. The method as defined in claim 1, wherein the target material is a clustered solid support including:

a solid support; and

a cluster of template strands attached to the solid support.

Claim 10. A kit, comprising:

a preparation fluid including a target material therein, wherein the target material is one of:

a complex including:

a solid support; and

sequencing-ready nucleic acid fragments attached to the solid support; or

a clustered solid support including:

a solid support; and

cluster of template strands attached to the solid support;

a first introduction fluid having a density less than a density of the target material, wherein the first introduction fluid is an aqueous buffer solution; and

a second introduction fluid having a density greater than the density of the target material, wherein the second introduction fluid is a sodium polytungstate solution or a sodium chloride solution.

Claim 11. The kit as defined in claim 10, wherein the aqueous buffer solution is a Tris-HCl buffer or a saline sodium citrate buffer.

Claim 12. The kit as defined in claim 10, wherein the second introduction fluid is the sodium polytungstate solution, and the sodium polytungstate solution has a concentration of about 1 gram of sodium polytungstate per 1 milliliter of water.

Claim 13. The kit as defined in one of claim 10 through 12, wherein the density of the first introduction fluid at a capture temperature is at least 0.1 g/cm3 less than the density of the target material at the capture temperature, and wherein the density of the second introduction fluid at the capture temperature is at least 0.1 g/cm3 greater than the density of the target material at the capture temperature.

Claim 14. The kit as defined in one of claims 10 or 13, wherein the density of the first introduction fluid is about 1 g/cm3 at a capture temperature, and wherein the density of the second introduction fluid is about 2 g/cm3 at the capture temperature.

Claim 15. The kit as defined in one of claims 10 through 14, further comprising a flow cell having two opposed sequencing surfaces.

Claim 16. The kit as defined in claim 15, wherein each of the opposed sequencing surfaces includes:

a polymeric hydrogel;

amplification primers attached to the polymeric hydrogel; and

chemical capture sites.

Claim 17. The kit as defined in claim 16, wherein:

the chemical capture sites are one member of a binding pair; and

the target material is a solid support coated with an other member of the binding pair.

Claim 18. The kit as defined in one of claims 10 through 17, further comprising an amplification mix including a liquid form of a temperature responsive material.

Claim 19. A method, comprising:

simultaneously immobilizing a first target material at a first of two opposed sequencing surfaces of a flow cell and a second target material at a second of the two opposed sequencing surfaces by introducing, into the flow cell, a target fluid including a carrier fluid, the first target material, and the second target material, wherein:

the carrier fluid of the target fluid has a fluid density;

the carrier fluid is an aqueous buffer solution or an ionic liquid;

the first target material has a first density less than the fluid density; and

the second target material has a second density greater than the fluid density.

Claim 20. The method as defined in claim 19 wherein:

at least some of the first target material becomes immobilized by respective capture sites on the first of the two opposed sequencing surfaces; and

at least some of the second target material becomes immobilized by respective capture sites on the second of the two opposed sequencing surfaces.

Claim 21. A target fluid, comprising:

a carrier fluid having a fluid density, the carrier fluid being selected from the group consisting of an aqueous buffer solution and an ionic liquid;

a first target material having a first density less than the fluid density, wherein the first target material includes:

a first solid support having a first solid support density approximately equal to the first density; and

sequencing-ready nucleic acid fragments attached to the first solid support; or

a first cluster of template strands attached to the first solid support; and

a second target material having a second density greater than the fluid density, wherein

the second target material includes:

a second solid support having a second solid support density approximately equal to the second density; and

sequencing-ready nucleic acid fragments attached to the second solid support; or

a second cluster of template strands attached to the second solid support.

Claim 22. A method, comprising:

introducing first and second target materials to a flow cell including two opposed sequencing surfaces, wherein the first target material has at least one property that is different from the second target material, wherein the at least one property is selected from the group consisting of density, charge, magnetism, and combinations thereof; and

exposing the first and second target materials to at least one condition selected from the group consisting of an electric field and a magnetic field, thereby causing the first target material to become immobilized by a capture site on a first of the two opposed sequencing surfaces and the second target material to become immobilized by a capture site on a second of the two opposed sequencing surfaces.

Claim 23. The method as defined in claim 22, wherein:

the first target material has a negative charge;

the second target material has a positive charge; and

the at least one condition is the electric field applied between the two opposed sequencing surfaces to generate positive charges at the first of the two opposed sequencing surfaces and negative charges at the second of the two opposed sequencing surfaces.

Claim 24. The method as defined in claim 23, wherein:

the first target material is selected from the group consisting a carboxylated solid support, a polyglutamic acid coated solid support, and a sulfate functionalized solid support; and

the second target material is an amine functionalized solid support.

Claim 25. The method as defined in claim 22, wherein:

the first and second target materials are introduced into the flow cell in a fluid having a first density;

the first target material is magnetic;

the second target material is non-magnetic and has a density greater than the first density; and

the at least one condition is the magnetic field applied to attract the first target material to the first of the two opposed sequencing surfaces.

Claim 26. The method as defined in claim 22, wherein:

the first and second target materials are introduced into the flow cell in a fluid having a first density;

the first target material is non-magnetic and has a density less than the first density;

the second target material is magnetic; and

the at least one condition is the magnetic field applied to attract the second target material to the second of the two opposed sequencing surfaces.

Claim 27. The method as defined in claim 22, wherein:

the first and second target materials are introduced into the flow cell in a fluid having a first density;

the first target material is negatively charged;

the second target material is non-charged and has a density greater than the first density; and

the at least one condition is the electric field applied between the two opposed sequencing surfaces to generate positive charges at the first of the two opposed sequencing surfaces and negative charges at the second of the two opposed sequencing surfaces.

Claim 28. The method as defined in claim 22, wherein:

the first and second target materials are introduced into the flow cell in a fluid having a first density;

the first target material is positively charged;

the second target material is non-charged and has a density greater than the first density; and

the at least one condition is the electric field applied between the two opposed sequencing surfaces to generate negative charges at the first of the two opposed

sequencing surfaces and positive charges at the second of the two opposed sequencing surfaces.

Claim 29. The method as defined in claim 22, wherein:

the first and second target materials are introduced into the flow cell in a fluid having a first density;

the first target material is non-charged and has a density less than the first density;

the second target material is positively charged; and

the at least one condition is the electric field applied between the two opposed sequencing surfaces to generate positive charges at the first of the two opposed sequencing surfaces and negative charges at the second of the two opposed sequencing surfaces.