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3. The method of claim 2, wherein:

said first material is a first single stranded DNA molecule and said second material is selected from the group consisting of a second single stranded DNA molecule, a single stranded PNA molecule, and a third single stranded DNA molecule covalently bound to a molecular species having an electrophoretic mobility substantially different from the electrophoretic mobility of said first single stranded DNA molecule; and

said third material is a duplex of said first material and said second material.

4. The method of claim 2, wherein said first material is selected from the group consisting of nucleic acid aptamers and antibodies, and said second material is selected from the group consisting of amino acids, peptides, proteins, cytokines, nucleic acids, cells, colloidal particles, bacterial particles, and viral particles.

5. The method of claim 2, wherein said first material is selected from the group consisting of amino acids, peptides, proteins, cytokines, nucleic acids, cells, colloidal particles, bacterial particles, and viral particles, and said second material is selected from the group consisting of nucleic acid aptamers and antibodies.

6. The method of claim 2, wherein said first material is a substrate, said second material is an enzyme, and said third material is the product of a reaction between said enzyme and said substrate.

7. The method of claim 2, wherein said first material is an enzyme, said second material is a substrate, and said third material is the product of a reaction between said enzyme and said substrate.

8. The method of claim 2, wherein said first material and said second material together produce a chemical reaction to form said third material.

9. The method of claim 2, wherein said first material is a drug and said second material is a target molecular species, and said third material is a complex of said drug and said target molecular species.

10. The method of claim 2, wherein said first material is a first protein and said second material is a second protein and said third material is a complex of said first protein and said second protein.

11. The method of claim 2, wherein said first material and said second material are both fluorescently labeled for detection along the temperature gradient.

12. The method of claim 2, wherein said fluid is selected from the group consisting of ionic aqueous solutions, ionic non-aqueous solutions, aqueous buffer solutions, and mixtures of aqueous and non-aqueous solutions.

13. The method of claim 2, wherein said electric field is applied using a set of components comprising an electrical power supply and two or more electrodes contacting said fluid.

14. The method of claim 2, wherein said step of establishing a temperature gradient comprises applying an electric current to said fluid to produce said temperature gradient by Joule heating.

15. The method of claim 2, wherein said step of establishing a temperature gradient comprises supplying thermal energy to said fluid via a heated block.

16. The method of claim 2, wherein said step of establishing a temperature gradient comprises removing thermal energy from said fluid via a cooled block.

17. The method of claim 2, wherein said flow is generated by electroosmosis.

18. The method of claim 2, wherein said flow is generated by pressure gradients.

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19. The method of claim 2, wherein said flow is generated by a combination of electroosmosis and pressure gradients.

20. The method of claim 2, wherein said step of applying an electric field, said step of establishing a temperature gradient, and said step of producing a bulk flow are comprised of using an electrical power supply to apply a voltage to said fluid, and wherein the electric field provided by said electrical power supply causes the electrophoretic motion of said first material, a flow of electric current in said fluid thereby generating said temperature gradient by Joule heating, and electroosmosis of said fluid thereby producing said flow of said fluid.

21. The method of claim 2, wherein said step of applying an electric field and said step of producing a bulk flow comprise using an electrical power supply to apply a voltage to said fluid, and wherein the electric field provided by said electrical power supply causes the electrophoretic motion of said first material, and electroosmosis of said fluid thereby producing said flow of said fluid.

22. The method of claim 2, wherein said third material is a duplex of said first material and said second material, and the magnitude of said flow is initially adjusted so that a local temperature at said second position is a first temperature; and further comprising the steps of:

detecting a focused band of said duplex at said second position, thereby determining an amount of said duplex in said focused band at said first temperature;

changing at least one of the group consisting of said electric field, said temperature gradient, and said flow so that a local temperature around said focused band of said duplex is at a second temperature;

detecting the focused band of said duplex at said second temperature, thereby determining an amount of said duplex in said focused band at said second temperature; and

comparing the amount of said duplex in said focused band at said first temperature to the amount of said duplex in said focused band at said second temperature, thereby determining if said interaction is different at said first temperature and said second temperature.

23. The method of claim 2, wherein said third material is a duplex of said first material and said second material, said duplex having a characteristic melting temperature, and the magnitude of said flow is initially adjusted so that a local temperature at said second position is a first temperature; and further comprising the steps of:

detecting a focused band of said duplex at said second position, thereby determining an amount of said duplex in said focused band at said first temperature;

progressively changing at least one of the group consisting of said electric field, said temperature gradient, and said flow so that the local temperature around said focused band becomes progressively different than said first temperature;

monitoring the amount of said duplex in said focused band; and

comparing the amount of said duplex in said focused band at each progressively different temperature, thereby determining the melting temperature.

24. The method of claim 2, wherein said first material is selected from the group consisting of single stranded DNA, single stranded PNA, single stranded DNA covalently bound to a molecular species having an electrophoretic mobility substantially different from the electrophoretic mobility of single stranded DNA, nucleic acid aptamers, antibodies, molecules with molecular weight less than 500 amu, amino acids, peptides, proteins, cytokines, nucleic acids, lectins, and carbohydrates; and said second material is selected from the