

17. A method of using the device of claim **16** to move the magnetic particle from the sample zone to the adjacent fluidic zone by activating the array of microcoils.

18. A method of using the device of claim **16**, wherein the magnetic particle comprises a magnetic affinity complex, comprising

introducing a sample suspected of comprising an analyte into the sample zone, wherein the magnetic affinity complex binds to the analyte to form a magnetic binding complex, and

activating the microcoil array to move the magnetic binding complex from the sample zone to another fluidic zone.

19. The method of claim **16**, wherein one or more fluidic zones comprises a signal affinity complex.

20. The method of claim **19**, wherein the magnetic particle comprises a magnetic affinity complex, comprising:

introducing a sample suspected of comprising an analyte into a fluidic zone,

combining the analyte with the magnetic affinity complex and the signal affinity complex, wherein the combination occurs simultaneously or sequentially, and wherein the magnetic affinity complex and the signal affinity complex bind to the analyte to form a sandwich binding complex,

activating the array of microcoils to move the sandwich binding complex to the detection zone of the fluidic network, and

detecting the sandwich binding complex in the detection zone, wherein the detection of the sandwich binding complex indicates the presence of the analyte.

21. The method of claim **20**, wherein the analyte is a protein, an antibody, or a nucleic acid.

22. The method of claim **20**, wherein multiple analytes are detected.

23. The method of claim **16**, wherein the magnetic particle comprises a competitive binding complex comprising a magnetic affinity complex and a signal analyte complex, further comprising:

introducing a sample suspected of comprising an analyte into the sample zone,

displacing the signal analyte complex from the competitive binding complex with analyte from the sample, and

detecting a signal from the signal analyte complex that was displaced from the competitive binding complex.

24. The method of claim **23**, wherein the analyte is a small molecule.

25. The method of claim **16**, wherein the magnetic particle comprises a coded magnetic affinity complex, comprising:

introducing a sample suspected of comprising an analyte into the sample zone, wherein the coded magnetic affinity complex binds to the analyte to form a coded magnetic binding complex,

activating the microcoil array to move the coded magnetic binding complex from the sample zone to a first affinity surface to immobilize the binding complex,

detaching the code from the coded magnetic binding complex,

providing a magnetic signal affinity complex, wherein the detached code binds to the magnetic signal affinity complex to form a coded magnetic signal binding complex,

activating the microcoil array to move the coded magnetic signal binding complex to the detection zone comprising a second affinity surface to immobilize the binding complex, and

detecting the coded magnetic signal binding complex in the detection zone.

26. The method of claim **16**, wherein the magnetic particle comprises a magnetic affinity complex, comprising:

introducing a sample suspected of comprising an analyte into a fluidic zone and combining it with the magnetic affinity complex to form a magnetic binding complex,

activating the array of microcoils to move the magnetic binding complex to a zone of the fluidic network comprising a coded affinity complex, wherein the coded affinity complex is not magnetic, and wherein the magnetic binding complex and the coded affinity complex form a coded sandwich binding complex,

activating the array of microcoils to move the coded sandwich binding complex to a zone of the fluidic network comprising a signal affinity complex, wherein the coded sandwich binding complex and signal affinity complex form a super-binding complex,

activating the array of microcoils to move the super-binding complex to the detection zone of the fluidic network, and

detecting the super-binding complex in the detection zone, wherein the detection of the super-binding complex indicates the presence of the analyte.

27. A method comprising

fabricating a fluidic network comprising a plurality of fluidic zones on a substrate, wherein at least one of the fluidic zones is a sample zone designed to hold a sample and a magnetic particle,

fabricating one or more diffusion barriers on the substrate, wherein a diffusion barrier connects each fluidic zone to the adjacent fluidic zone; and

forming an integrated circuitry component for storing data on the substrate.

28. The method of claim **27**, further comprising functionally connecting a magnetic microarray to the substrate, wherein the microcoils are programmably activatable to generate a magnetic field in proximity to each microcoil and to transport the magnetic particle in the fluidic network without fluidic movement of a fluid in the plurality of the fluidic zones.

29. The method of claim **27**, further comprising functionally connecting a detection element to the substrate, wherein the detection element is an optical detection element or an electrical detection element.

30. The method of claim **27**, further comprising functionally connecting a vibration element to the substrate, wherein the vibration element is capable of vibrating the fluid within one or more fluidic zones.

31. The method of claim **27**, wherein fabricating the plurality of fluidic zones on a substrate comprises combining two or more solid supports.

32. The method of claim **27**, wherein fabricating the diffusion barrier comprise fabricating a fluidic channel.

33. The method of claim **27**, wherein fabricating the diffusion barrier comprises fabricating a thermally-sensitive barrier.