CLAIMS

WHAT IS CLAIMED IS:

1. A method for detecting an analyte in a bodily fluid sample using a point-of-care system including a cartridge, an assay assembly, a fluid transfer device, and a detection assembly, the method comprising:

positioning, via the fluid transfer device, the assay assembly at a first location that places a sample unit of the cartridge into fluid communication with the assay assembly, the assay assembly comprising a tip and an interior reaction site having thereon an immobilized binding reagent configured to bind with the analyte;

transferring the bodily fluid sample from the sample unit to the assay assembly via the tip of the assay assembly;

positioning, via the fluid transfer device, the assay assembly at a second location that places an addressable reagent unit of the cartridge into fluid communication with the assay assembly, the addressable reagent unit comprising a cartridge reagent;

transferring the cartridge reagent from the addressable reagent unit to the assay assembly via the tip of the assay assembly such that a reaction occurs within the assay assembly to produce a signal indicative of the presence of the analyte in the bodily fluid sample; and

detecting, by the detection assembly, the signal indicative of the presence of the analyte.

2. The method of claim 1, wherein the addressable reagent unit is a first addressable reagent unit, the cartridge reagent is a first reagent, and further comprising:

positioning, via the fluid transfer device, the assay assembly at a third location that places a second addressable reagent unit of the cartridge into fluid communication with the assay assembly, the second addressable reagent unit comprising a second reagent; and

transferring the second reagent from the second addressable reagent unit to the assay assembly via the tip of the assay assembly.

3. The method of claim 2, wherein transferring the second reagent from the second addressable reagent unit to the assay assembly occurs before transferring the first reagent from the first addressable reagent unit to the assay assembly.

4. The method of claim 1, wherein detecting, by the detection assembly, the signal indicative of the presence of the analyte comprises:

illuminating the assay assembly via a light source and a guiding element of the detection assembly.

5. The method of claim 1, wherein the binding reagent includes an antibody, a nucleic acid probe, or a cell membrane receptor.

6. The method of claim 1, wherein the bodily fluid sample includes blood, serum, plasma, saliva, urine, tears, gastric fluid, digestive fluid, bone marrow, cerebrospinal fluid, stool, semen, vaginal fluid, or liquid extracted from tissue.

7. The method of claim 1, further comprising detecting an intensity of the signal indicative of the presence of the analyte.

8. The method of claim 1, further comprising incubating the assay assembly under heat after transferring the bodily fluid sample to the assay assembly.

9. The method of claim 1, further comprising communicating the signal as detected by the detection assembly to an external device via a communication assembly, wherein the external device is configured to calculate a concentration of the analyte in the bodily fluid sample based on the signal.

10. The method of claim 1, further comprising executing a protocol by a programmable processor of the fluid transfer device so that positioning the assay assembly and transferring the bodily fluid sample and the cartridge reagent are performed according to the protocol.

11. The method of claim 1, further comprising repeating the step of transferring the cartridge reagent to the assay assembly.

12. The method of claim 1, further comprising pretreating the bodily fluid sample prior to transferring the bodily fluid sample to the assay assembly.

13. The method of claim 1, further comprising:

reading an identifier on the cartridge by means of an identifier detector;

selecting automatically a protocol for performing an assay based on the identifier on the cartridge;

communicating the protocol to a programmable processor of the fluid transfer device; and

transferring the bodily fluid sample and the cartridge reagent to the assay assembly based on the protocol.

14. The method of claim 1, wherein the cartridge reagent includes a conjugate reagent, a wash buffer, a wash solution, a detergent, a polymer, a chelating agent, an albumin-binding reagent, an anticoagulant, an enzyme substrate, a diluent, or a detector conjugate.

15. The method of claim 1, wherein the assay assembly is directly coupled to the fluid transfer device.

16. The method of claim 1, wherein the immobilized binding reagent is an antibody.

17. The method of claim 1, wherein the assay assembly comprises a pipette tip.

18. The method of claim 1, further comprising diluting the bodily fluid sample.

19. The method of claim 18, wherein diluting the bodily fluid sample comprises transferring a diluent from a diluent unit to the assay assembly via the tip of the assay assembly.

20. The method of claim 1, further comprising transmitting the signal indicative of the presence of the analyte as detected by the detection assembly to an external device.

21. The method of claim 1, wherein transferring the bodily fluid sample from the sample unit to the assay assembly comprises aspirating the bodily fluid sample.

22. The method of claim 1, further comprising engaging the assay assembly using the fluid transfer device prior to positioning the assay assembly at the first location.