CLAIMS

What is claimed is:

1. An apparatus comprising:

a sensor with an active surface having a plurality of reaction sites, a lid, and a flow channel formed at least partially by the active surface of the sensor and the lid,

where the lid comprises an illumination source and a heater.

2. The apparatus of claim 1, wherein the sensor comprises a Complementary Metal-Oxide Semiconductor (CMOS) detection device.

3. The apparatus of claim 2, wherein the CMOS detection device comprises a plurality of detection pixels.

4. The apparatus of any of claims 1 - 3, wherein the lid further comprises a non-transparent material.

5. The apparatus of any of claims 1 - 3, wherein the lid further comprises an opaque material.

6. The apparatus of any of claims 1 - 5, wherein the lid further comprises a fluidic channel therein, where the fluidic channel is in fluidic communication with the flow channel.

7. The apparatus of any of claims 1 - 6, wherein the lid further comprises a reservoir.

8. The apparatus of claim 7, wherein the reservoir comprises a reagent.

9. The apparatus of claim 7 or 8, wherein the reservoir comprises a buffer.

10. The apparatus of any of claims 1 - 9, wherein the heater is a resistive heater.

11. The apparatus of any of claims 1 - 10, wherein the lid is on an opposite side of the flow channel from the active surface of the sensor.

12. The apparatus of any of claims 1 - 11, wherein the illumination source comprises a light emitting diode (LED).

13. The apparatus of any of claims 1 - 11, wherein the illumination source comprises a plurality of LEDs.

14. The apparatus of any of claims 1 - 12, wherein the illumination source is located along a periphery of the lid.

15. The apparatus of claim 14, wherein the lid comprises a plurality of light guides, whereby the light guides guide light from the illumination source toward the active surface of the sensor.

16. The apparatus of any of claims 1 - 15, wherein the illumination source comprises a thin film organic LED.

17. The apparatus of any of claims 1 - 16, wherein the illumination source comprises a silicon-based LED.

18. The apparatus of any of claims 1 - 17, wherein the illumination source is on a bottom surface of the lid, where the bottom surface of the lid faces the active surface of the sensor.

19. The apparatus of any of claims 1 - 18, further comprising a pump, where the pump is fluidically coupled to the flow channel.

20. The apparatus of claim 19, wherein the pump is downstream from the sensor.

21. The apparatus of claim 19, wherein the lid further comprises an outlet port, wherein the pump is adjacent to the outlet port of the lid.

22. The apparatus of any of claims 19 - 21, wherein there is no removable connection between the flow channel and the pump.

23. The apparatus of any of claims 19 - 22, wherein the pump is a piezoelectric pump having a flexible diaphragm element.