CLAIMS

1. Apparatus, comprising:

a supporting structure;

a sensor on the supporting structure, the sensor comprising an active surface;

a pair of columns, each column situated on the supporting structure at opposite sides of the sensor, each of the pair of columns comprising a column height relative to a top surface of the supporting structure, the column height being higher than a height of the active surface of the sensor relative to the top surface of the supporting structure, where each column is not on the active surface of the sensor; and

a lidding layer on the pair of columns and over the active surface, the lidding layer being supported at opposite ends thereof by the pair of columns;

wherein the active surface of the sensor, the lidding layer and the pair of columns form an opening above at least more than about half of the active surface of the sensor, and wherein the supporting structure, the sensor, the lidding layer and the pair of columns together form a flow cell.

2. The apparatus of claim 1, wherein each of the pair of columns comprises:

a bottom column portion at the opposite sides of the sensor; and

a top column portion over each bottom column portion.

3. The apparatus of claim 2, wherein the pair of columns comprises at least one filler material.

4. The apparatus of claim 3, wherein the at least one filler material comprises at least one of an epoxy and a plastic molding compound.

5. The apparatus of any one of claims 1 to 4, wherein the lidding layer comprises glass.

6. The apparatus of claim 5, wherein the lidding layer comprises at least one of aluminosilicate glass and flat panel display glass.

7. The apparatus of any one of claims 1 to 6, wherein the supporting structure comprises one or more dielectric layers, each of the one or more dielectric layers comprising one or more conductive pathways therein.

8. The apparatus of any one of claims 1 to 7, wherein the sensor comprises one or more semiconductor materials.

9. The apparatus of claim 7, wherein the sensor comprises an image sensor fabricated using Complementary Metal-Oxide-Semiconductor (CMOS) technology.

10. The apparatus of any one of claims 1 to 9, wherein a protective layer on the active surface of the sensor comprises a plurality of channels.

11. The apparatus of any one of claims 1 to 10, wherein the apparatus is part of a cartridge for at least one of biological analysis and chemical analysis.

12. A method, comprising:

forming a flow cell, the forming comprising:

placing a sensor on a supporting structure, the sensor comprising an active surface;

forming a pair of columns, each column at opposite sides of the sensor, each of the pair of columns comprising a column height relative to a top surface of the supporting structure, the column height being higher than a height of the active surface of the sensor relative to the top surface of the supporting structure, where each column is not on the active surface of the sensor; and

placing a lidding layer on top surfaces of the pair of columns, such that the lidding layer and the pair of columns form a space above at least about half of the active surface of the sensor.

13. The method of claim 12, wherein placing the sensor comprises placing an image sensor fabricated using CMOS technology.

14. The method of claim 12 or 13, wherein forming the pair of columns comprises:

forming a bottom column portion at the opposite sides of the sensor; and

forming a top column portion over each bottom column portion.

15. The method of any one of claims 12 to 14, wherein the supporting structure comprises one or more dielectric layers, the one or more dielectric layers each comprising one or more conductive pathways therein.

16. The method of any one of claims 12 to 15, the method further comprising coupling the flow cell and a cartridge for at least one of biological analysis and chemical analysis.

17. The method of any one of claims 12 to 16, the method further comprising using the flow cell for sequencing.

18. The method of any one of claims 12 to 17, the method further comprising using the flow cell for genotyping.

19. The method of any one of claims 12 to 18, wherein the pair of columns comprises at least one filler material.

20. The method of claim 19, wherein the at least one filler material comprises at least one of an epoxy and a plastic molding compound.