Claims

1. A microfluidic system, comprising:

a receiving station, the receiving station adapted to receive a microfluidic device having a plurality of chambers, the microfluidic device coupled to a carrier, with at least some of the plurality of chambers coupled to a plurality of inlets in the carrier;

an interface plate adapted to engage at least one of the inlets in the carrier;

a fluid source coupled to the interface plate and adapted to provide pressurized fluid to at least one of the inlets in the carrier; and

a controller coupled to the fluid source and to the interface plate for directing fluid from the fluid source to the carrier.

2. The system as in claim 1 wherein the microfluidic device further comprises a plurality of valve lines, and wherein the fluid is directed into at least some of the valve lines by the controller.

3. The system as in claim 2 wherein the controller is further adapted to open and close at least some of the valve lines.

4. The system as in claim 1 wherein the carrier further comprises a plurality of wells, and wherein at least some of the wells are coupled to corresponding inlets of the plurality of inlets, the corresponding inlets being adapted to receive a fluid for analysis in the microfluidic device.

5. The system as in claim 4 wherein the controller is adapted to apply a pressure through the interface plate to at least some of the plurality of wells in order to drive the fluid therein into at least some of the plurality of chambers.

6. The system as in claim 1 wherein the interface plate comprises two or more separate interface plates each adapted to engage at least one inlet in the carrier.

7. The system as in claim 1 wherein the carrier comprises an accumulator chamber having an accumulator port, and wherein the interface plate comprises a port that is in fluid communication with the accumulator chamber.

8. The system as in claim 7 wherein the accumulator chamber further comprises a valve for controlling fluid movement into the accumulator chamber through the accumulator port, the valve being in fluid communication with the accumulator port.

9. The system as in claim 8, wherein the valve permits fluid flow into the accumulator chamber through the accumulator port while restricting fluid flow out of the accumulator chamber through the accumulator port.

10. The system as in claim 9, wherein the valve permits fluid flow out of the accumulator when the valve is actuated.

11. The system as in claim 10, wherein the valve is actuated mechanically.

12. The system as in claim 10, wherein the valve is a check valve.

13. The system as in claim 8, wherein the interface plate comprises a valve actuator which is adapted to engage the valve when the interface plate and carrier are coupled.

14. The system as in claim 7, wherein the accumulator chamber further comprises a liquid.

15. The system as in claim 7, wherein the accumulator chamber further comprises a gas.

16. The system as in claim 7, wherein the accumulator further comprises a gas and a liquid.

17. The system as in claim 15, wherein the gas is pressurized relative to a gas pressure outside of the accumulator chamber.

18. The system as in claim 1 wherein the interface plate further comprises a sealing gasket.

19. The system as in claim 7 wherein the accumulator is adapted to maintain a pressure above a desired pressure level in order to a maintain a valve in the microfluidic device in a closed state.

20. The system as in claim 19 wherein the closed valve lasts for at least two (2) days.