CLAIMS

1. An automated apparatus for preparing a liquid bioprocess solution, comprising:

a first fluid entry connected to a first fluid source providing a first fluid;

a volume sensor located near the first fluid entry to measure at least one of a volume or a flow rate of the first fluid into the apparatus;

an array of tubing for fluid flow within the apparatus;

at least one mixing chamber having a lower port connected to the first fluid entry through the array of tubing and an upper port connected to the first fluid entry through the array of tubing for the first fluid to enter the at least one mixing chamber through the lower port and the upper port;

a plurality of valves provided within the array of tubing; and

a mixing controller comprising at least a processor and a memory with instructions stored thereon, the mixing controller operable to independently control a first valve associated with the lower port and a second valve associated with the upper port based on measurements received from the volume sensor.

2. The automated apparatus of claim 1, further comprising one or more additional sensors configured to take one or more additional measurements during preparation of the liquid bioprocess solution.

3. The automated apparatus of claim 2, wherein the one or more additional sensors comprise at least one of a pressure sensor, a conductivity sensor, a volume sensor, or a timer.

4. The automated apparatus of claim 2, wherein the one or more additional measurements comprise at least one of pressure, conductivity, a volume of water consumed during the preparation, flow rate or elapsed time.

5. The automated apparatus of claim 2, wherein the mixing controller is configured to control the plurality of valves in response to at least one of a measurement decreasing below, equaling, or exceeding a measurement threshold.

6. The automated apparatus of claim 1, further comprising two or more inlets to the array of tubing, each inlet configured to direct a flow of a fluid other than the first fluid into the automated apparatus.

7. The automated apparatus of claim 6, wherein one of the two or more inlets is configured to be coupled to a compressed air source.

8. The automated apparatus of claim 7, wherein the mixing controller is further configured to open the compressed air source to evacuate prepared liquid bioprocess solution from the automated apparatus.

9. The automated apparatus of claim 1, wherein the automated apparatus further comprises a second mixing chamber containing an additive.

10. The automated apparatus of claim 9, wherein the mixing controller is configured to control the plurality of valves such that the additive is mixed with the first fluid in the second mixing chamber and subsequently added to the first mixing chamber.

11. The automated apparatus of claim 1, wherein the bioprocess solution is a solution selected from the group consisting of: a cell culture media and a buffer.

12. The automated apparatus of claim 11, wherein the first fluid is water.

13. The automated apparatus of claim 1, wherein the at least one mixing chamber contains a powdered dry ingredient.

14. The automated apparatus of claim 1, wherein the at least one mixing chamber contains a granulated dry ingredient.