CLAIMS

What is claimed is:

1. An electroporation docking station, comprising:

   (a) a receptacle for securing an electroporation apparatus in an upright position, the electroporation apparatus comprising a plurality of chambers wherein each chamber (i) is connected to a flow channel by way of a chamber valve and (ii) comprises electrodes configured to generate an electric field within the chamber during electroporation;

   (b) a plurality of electrical contacts arranged to align with the electrodes in each chamber of the plurality of chambers when the electroporation apparatus is secured in the receptacle;

   and

   (c) a plurality of valve actuators arranged to engage with the chamber valves when the electroporation apparatus is secured in the receptacle.

2. The electroporation docking station of claim 1, further comprising:

   a pump actuator arranged to engage with a pump of the electroporation apparatus when the electroporation apparatus is secured in the receptacle.

3. The electroporation docking station of claim 1, further comprising: an electric circuit that generates an electric field using the plurality of electrical contacts.

4. The electroporation docking station of claim 1, further comprising:

   (a) a container comprising a liquid medium that connects to an inlet port of the electroporation apparatus when the electroporation apparatus is secured in the receptacle; and

   (b) a container that connects to an outlet port of the electroporation apparatus when the apparatus is secured in the receptacle.

5. The electroporation docking station of claim 1, wherein the receptacle comprises an opening and the electrical contacts are aligned linearly along a length of the receptacle.

6. The electroporation docking station of claim 1, wherein the plurality of electrical contacts are located on opposing sides of thereceptacle.

7. The electroporation docking station of claim 1, wherein each of the plurality of chamber valves is a spring-type valve, and wherein each valve actuator of the plurality of valve actuators is capable of opening a chamber valve by applying force to it.

8. The electroporation docking station of claim 7, wherein the plurality of valve actuators are configured to open the chamber valves of the electroporation apparatus simultaneously.

9. The electroporation docking station of claim 7, wherein the plurality of valve actuators are configured to open each chamber valve of the electroporation apparatus one at a time.

10. An electroporation method, comprising:

(a) securing an electroporation apparatus in an upright position in the receptacle of the electroporation docking station of claim 1; and (b) generating an electric field using the plurality of electrical contacts of the electroporation docking station.

11. The method of claim 10, further comprising: pumping, during the cell collection process, a liquid medium into the chamber valves of the electroporation apparatus by operating a pump actuator of the electroporation docking station engaged with a pump of the electroporation apparatus when the electroporation apparatus is secured in the receptacle.

12. The method of claim 10, further comprising: executing a cell collection process by operating one or more of the plurality of valve actuators of the electroporation docking station.

13. A method for electroporation, the method comprising:

(a) inserting an electroporation apparatus in an upright position into the receptacle of the docking station of claim 1; and

(b) generating an electric field within one or more chambers of the electroporation apparatus using the electrodes;

wherein the electroporation apparatus comprises:

a plurality of chambers, each connected to a flow channel by way of a chamber valve; and

wherein the electroporation apparatus comprises electrodes configured to generate an

electric field within the chamber during electroporation.

14. The method of claim 13, wherein each chamber valve is opened one at a time.

15. The method of claim 13, wherein pressure within the plurality of chambers is maintained by way of a vent or air filter connected to an air flow channel running between the chambers of the plurality of chambers.

16. The method of claim 13, further comprising the following steps:

(c) depositing the plurality of cells into a plurality of openings of the electroporation apparatus leading to the plurality of chambers; and

(d) after such deposition of cells, applying a seal to the plurality of openings;

wherein the electroporation apparatus is inserted in an upright position into the receptacle of a docking station that comprises: (i) a plurality of electrical contacts arranged to align with the electrodes in each chamber of the plurality of chambers in the electroporation apparatus when the apparatus is secured in the receptacle; and (ii) a plurality of valve actuators arranged to engage with the chamber valves when the electroporation apparatus is secured in the receptacle.

17. The method of claim 13, wherein the electroporation apparatus comprises a chamber comprising a pair of electrodes on opposite sides of the chamber; and wherein each electrode of the pair of electrodes comprises both an interior portion inside the chamber and an exterior portion external to the chamber

18. The method of claim 13, further comprising: executing a cell collection process by opening the chamber valve and thus allowing the plurality of cells to flow to an outlet port.

19. The method of claim 13, wherein the electroporation apparatus further comprises: an inlet port and an outlet port, each connected to the flow channel by way of a flanking flow channel.

20 The method of claim 13, wherein the electroporation apparatus further comprises: a pump for pumping a liquid medium from the flow channel into at least one chamber of the plurality of chambers.

21. The method of claim 13, wherein the electroporation apparatus further comprises: a surface comprising a plurality of openings leading to the plurality of chambers; and an airflow channel

below the plurality of openings that connects airflow between the chambers of the plurality of chambers.

22. The method of claim 21, wherein the electroporation apparatus further comprises: a vent or air filter connecting the airflow channel to an exterior of the electroporation apparatus.

23. The method of claim 21, wherein the electroporation apparatus further comprises: a seal configured to cover the plurality of openings.

24. The method of claim 13, wherein each chamber of the plurality of chambers has a shape that narrows toward the chamber valve.

25. The method of claim 13, wherein the plurality of chambers comprises: a chamber comprising a pair of electrodes on opposite sides of the chamber.

26. The method of claim 25, wherein each electrode of the pair of electrodes comprises: an interior portion inside the chamber; and an exterior portion external to the chamber that is in contact with an electric circuit.

27. The method of claim 13, wherein each chamber of the plurality of chambers has a volume of at least 250 μL.

28. The method of claim 13, wherein each chamber of the plurality of chambers has a volume of at least 500 μL.

29. The method of claim 20, wherein the pump further comprises a valve that permits one-directional flow of fluid.

30. The method of claim 13, wherein each chamber valve is a pinch-valve or pinch-type valve.

31. The method of claim 13, wherein the plurality of chambers, in combination, are capable of storing at least 2 mL of cells in liquid suspension for electroporation.