What Is Claimed Is:

1. A microfluidic system comprising:

a reservoir comprising a solution;

a cell confinement region; and

a microfluidic device comprising a plurality of channels fluidically coupling the reservoir to the cell confinement region;

wherein the microfluidic system is configured to flow the solution through the cell confinement region.

2. The microfluidic system of claim 1, wherein the cell confinement region comprises a cell.

3. The microfluidic system of claim 2, wherein the microfluidic system is configured to prevent egress of the cell from the cell confinement region.

4. The microfluidic system of claim 2, wherein the microfluidic system is configured to prevent egress of the cell from the cell confinement region with an optical, magnetic, or electrokinetic force.

5. The microfluidic system of claim 2, wherein the cell confinement region is partitioned from the plurality of channels by a semipermeable barrier that prevents egress of the microcarrier, the cell growth disc, or the cell growth carrier from the cell confinement region.

6. The microfluidic system of claim 2, wherein the cell is coupled to a microcarrier, a cell growth disc, a cell growth carrier, or a surface of the cell confinement region.

7. The method of claim 6, wherein the microcarrier, the cell growth disc, the cell growth carrier, or the surface of the cell confinement region is dissolvable.

8. The microfluidic system of claim 6, wherein the microfluidic system is configured to prevent egress of the microcarrier, the cell growth disc, or the cell growth carrier from the cell confinement region.

o

9. The microfluidic system of claim 6, wherein the cell confinement region is partitioned from the plurality of channels by a semipermeable barrier that prevents egress of the microcarrier, the cell growth disc, or the cell growth carrier from the cell confinement region.

10. The microfluidic system of claim 9, wherein the semipermeable barrier comprises a membrane, a frit, a filter, a pillar, or a weir.

11. The microfluidic system of claim 2, wherein a diameter of an opening that fluidically couples the cell confinement region to the plurality of channels is smaller than a diameter of the cell.

12. The microfluidic system of claim 6, wherein a diameter of an opening that fluidically couples the cell confinement region to the plurality of channels is larger than a diameter of the microcarrier, the cell growth disc, or the cell growth carrier.

13. The microfluidic system of claim 1, wherein the microfluidic system comprises a pump or a syringe configured to flow the solution through the cell confinement region.

14. The microfluidic system of claim 1, wherein the microfluidic system comprises a plurality of cell confinement regions.

15. The microfluidic system of claim 14, wherein the plurality of cell confinement regions are connected in parallel, in series, or a combination thereof by the plurality of channels.

16. The microfluidic system of claim 1, wherein the microfluidic device further comprises a fluid reservoir that is fluidically coupled to the cell confinement region.

17. The microfluidic system of claim 16, wherein the fluid reservoir comprises a plurality of serpentine channels.

o

18. The microfluidic system of claim 16, wherein the microfluidic system is configured to prevent egress of the cells, the microcarrier, the cell growth disc, or the cell growth carrier from the cell confinement region into the fluid reservoir.

19. The microfluidic system of claim 1, wherein the cell confinement region is detachable from the microfluidic device.

20. The microfluidic system of claim 1, wherein the cell confinement region is configured to screw into the microfluidic device and fluidically couple to the plurality of channels.

21. The microfluidic system of claim 1, wherein the cell confinement region comprises an opening through which the cells, the microcarrier, the cell growth disc, or the cell growth carrier can be added.

22. The microfluidic system of claim 1, wherein the cell confinement region comprises a lower portion disposed within a flow path of the plurality of channels and an upper region that is not exposed to the flow path of the plurality of channels.

23. The microfluidic system of claim 22, wherein the flow path comprises a downward trajectory through the cell confinement region.

24. The microfluidic system of claim 1, wherein the solution is contained within oil within the reservoir.

25. The microfluidic system of claim 1, wherein the reservoir comprises a hydrophobic coating.

26. The microfluidic system of claim 6, wherein the surface of the cell confinement region comprises a porous support.

27. The microfluidic system of claim 1, wherein the solution comprises conditioned media.

o

28. The microfluidic system of claim 2, wherein the cell is configured to express a fluorescent protein upon contact to an analyte in the solution.

29. The microfluidic system of claim 28, wherein the analyte is a bacterium or a virus.

30. The microfluidic system of claim 1, further comprising an instrument configured to measure a cellular response.

31. The microfluidic system of claim 1, wherein the instrument is configured for single cell analysis, nucleic acid analysis, or protein analysis.

32. A microfluidic system comprising:

a reservoir comprising a solution;

a cell confinement region comprising cells coupled to a surface, a microcarrier, a cell growth disc, or a cell growth carrier;

a microfluidic device comprising a plurality of channels fluidically coupling the reservoir to the cell confinement region through at least one opening, wherein the at least one opening is configured to prevent egress of the cells, the microcarrier, the cell growth disc, or the cell growth carrier from the cell confinement region into the plurality of channels; and

a pump configured to flow the solution through the cell confinement region.

33. A method for measuring the concentration of an analyte in solution, comprising:

contacting cells with the solution, and

measuring a response of the cells to the solution.

34. The method of claim 33, wherein the contacting is performed within the cell confinement region of the microfluidic system of claim 1.

35. The method of claim 33, wherein the measuring comprises an optical force measurement, spectroscopy, mass spectrometry, single cell analysis, nucleic acid sequencing, or a combination thereof.

o

36. The method of claim 34, wherein the cells express a fluorescent protein upon contact to the solution, and wherein the measuring comprises detecting the fluorescent protein.

37. The method of claim 34, wherein the cell confinement region is detached from the microfluidic device prior to the measuring.

38. The method of claim 33, wherein the cells are added to the cell confinement region while frozen.

o