Claims

1. A method of using a device to remove media from a cell culture apparatus, wherein the device includes:

a gas delivery component that is capable of connecting to a filter that is connected to a gas permeable cell culture apparatus, said gas delivery component capable of delivering gas into said gas permeable cell culture apparatus by way of said filter, a fluid detection component that is capable of determining when the fluid moving within a media removal conduit that is connected to said gas permeable cell culture apparatus changes from liquid to gas, said fluid detection component capable of sending a signal to a fluid flow control component that is capable of terminating fluid flow through said media removal conduit, the method comprising:

reducing the volume of liquid media in a cell culture apparatus wherein said bottom is comprised of gas permeable material and cells reside on the bottom of the device in order to increase the concentration of cells per milliliter of media by connecting said gas delivery component to a filter that is connected to said gas permeable cell culture apparatus, said cell culture apparatus including a media removal conduit, connecting said fluid detection component to said media removal conduit, connecting said fluid flow control component to said media removal conduit, initiating gas delivery from said gas delivery component, whereby gas moves into said cell culture apparatus, the gas displaces media from said cell culture apparatus into a media collection vessel connected to said media removal conduit, said fluid detection component determines when the fluid that is moving through said media removal conduit has changed from liquid to gas and upon making that determination said fluid detection component sends a signal to said fluid flow control component, and upon said fluid flow control component receiving said signal said flow control component terminates the flow of fluid through said media removal conduit.

2. The method of Claim 1 wherein the gas permeable material is in contact with a gas permeable material support.

3. The method of Claim 1 wherein the gas permeable material of the cell culture apparatus is comprised of silicone.

4. The method of Claim 3 wherein the gas permeable material is silicone and has a thickness between 0.001 inches and 0.024 inches.

5. The method of Claim 1 wherein the bottom of the gas permeable cell culture apparatus is in a substantially horizontal state when gas displaces media from the cell culture apparatus.

6. The method of Claim 1 wherein prior to reducing the volume of media, the lowest point of the media to the highest point of the media is from 1.0 cm to 10.0 cm.

7. The method of Claim 1 wherein said cells are comprised of T cells.

8. The method of Claim 1 wherein said cells are comprised of CAR T cells.

9. The method of Claim 1 wherein after said first flow control component terminates the flow of fluid through said media removal conduit fresh media is added to said cell culture apparatus through said media removal conduit.

10. The method of claim 1 wherein

said device including a second fluid detection component and a second flow control component, and said gas permeable apparatus including a cell removal conduit, and

said second fluid detection component being capable of determining when the fluid moving within a cell removal conduit changes from liquid to gas and sending a signal to said second fluid flow control component, which is capable of terminating fluid flow through said cell removal conduit, and

the method further comprising removing cells from said gas permeable cell culture apparatus by connecting said second fluid detection component to said cell removal conduit, connecting said second fluid flow control component to said cell removal conduit, initiating gas delivery from said gas delivery component, whereby gas moves into said cell culture device and displaces media and cells from said cell culture apparatus by way of said cell removal conduit from said cell culture device into a cell collection vessel connected to said cell removal conduit, said second fluid detection component determining when the fluid that is moving through said cell removal conduit has changed from liquid to gas and when that is determined said second fluid detection component sends a signal to said second fluid flow control component and upon receiving said signal, said second flow control component terminates the flow of fluid through said cell removal conduit.

11. The method of Claim 10 wherein the gas permeable material is in contact with a gas permeable material support.

12. The method of Claim 10 wherein the gas permeable material of the cell culture device is

comprised of silicone.

13. The method of Claim 10 wherein the gas permeable material has a thickness between 0.001 inches and 0.024 inches.

14. The method of Claim 10 wherein said cells are comprised of T cells.

15. The method of Claim 10 wherein said cells are comprised of CAR T cells.

16. The method of Claim 10 wherein prior to or while removing cells the cell culture apparatus is agitated to dislodge cells from the growth surface.

17. The method of Claim 16 wherein the cell culture apparatus is oriented into a position that places the cell removal conduit at the low point of the device.

18. The method of Claim 10 wherein the gas permeable material is in contact with a gas permeable material support.

19. The method of Claim 10 wherein the media removal conduit includes a wall that is shared with the cell culture apparatus.

20. The method of Claim 10 wherein the bottom of the cell culture apparatus includes a cell collection pocket which the cell removal conduit resides during the step of collecting cells.