

WHAT IS CLAIMED IS:

1. A static animal cell culture and cell recovery device comprising:
an internal volume; and
a growth surface comprised of gas permeable material;
an upper confine bounding the uppermost location of said internal volume;
a cell removal conduit including a cell removal opening;
a medium removal conduit including a medium removal opening; wherein
the distance between said medium removal opening and said growth surface being greater than
the distance between said cell removal opening and said growth surface; and
said device absent pumps or other mechanisms to force gas past said gas permeable material of
said growth surface.
2. The device of claim 1 wherein said gas permeable material is liquid impermeable.
3. The device of claim 1 wherein said gas permeable material is non porous.
4. The device of claim 1 not including a stirring mechanism or any other mechanism to mix
cells and/or medium.
5. The device of claim 1 wherein the distance between said upper confine and said growth
surface is 2.0 cm or more.

6. The device of claim 1 wherein a growth support surface is in contact with said growth surface, and said growth surface is in a horizontal position and gas makes contact with said growth surface when said device is culturing cells.
7. The device of claim 1 wherein the distance between said medium removal conduit and said growth surface is 50% or less than the distance between said upper confine and said growth surface.
8. The device of claim 1 wherein the distance between said medium removal conduit and said growth surface is 0.2 cm or more.
9. The device of claim 8 wherein the distance between said medium removal conduit and said growth surface is 2.0 cm or less.
10. The device of claim 1 wherein the distance between said cell removal conduit and said growth surface is 0.2 cm or less.
11. The device of claim 1 including at least one wall connecting said upper confine and said growth surface, wherein at least one wall is perpendicular to said growth surface.
12. The device of claim 10 wherein said cell removal opening is located in proximity of a location in which at least one wall makes contact with said growth surface.

13. The device of claim 1 including more than one medium removal conduit, the distance between each medium removal conduit and said growth surface being different.
14. The device of claim 11 wherein the distance between at least one of said medium removal conduits and said growth surface is at or less than 50% of the distance between said growth surface and said upper confine.
15. The device of claim 1 including a vent filter.

CLAIMS

1. A gas permeable cell culture and cell recovery device for static cell culture comprising:

an internal volume bounded at least in part by a growth surface and an opposing upper confine, said growth surface comprised of liquid impermeable gas permeable material, at least a portion of said gas permeable material in contact with ambient gas,

a vent,

a medium removal conduit including a medium removal opening,

a cell removal conduit including a cell removal opening,

and when the device is oriented in the static culture position the growth surface is in a horizontal position and is located at least in part below said opposing upper confine, the distance from said growth surface to said cell removal opening is less than the distance from said growth surface to said medium removal opening, and the maximum distance from the upper confine to the growth surface is the maximum potential medium height of the internal volume.

2. The device of claim 1 wherein said maximum potential medium height is beyond 2.0 cm.

3. The device of claim 1 wherein when said device is in the static cell culture position the distance between said growth surface and said medium removal opening is 50% or less than the distance between said growth surface and said upper confine.

4. The device of claim 1 wherein when said device is in the static cell culture position the distance between said growth surface and said medium removal opening is at least 0.2 cm.
5. The device of claim 4 wherein the distance between said growth surface and said medium removal opening is not beyond 2.0 cm.
6. The device of claim 1 wherein when said device is in the static cell culture position said vent resides at a height greater than the height of said medium opening.
7. The device of claim 1 wherein said vent resides at a height beyond the height of said upper confine when the device is in the static cell culture position.
8. The device of claim 1 wherein when said device is in the static cell culture position said cell removal conduit is in contact with said bottom.
9. The device of claim 1 wherein the ratio of the internal volume to the growth surface area is between two and twenty milliliters per square centimeter of growth area.
10. The device of claim 1 including more than one medium removal opening, each medium removal opening residing at a different height from said growth surface when said device is in the static cell culture position.
11. The device of claim 1 including a growth surface support.

12. The device of claim 1 wherein said gas permeable material is comprised of silicone.

13. The device of claim 1 wherein said cell removal opening is oriented at the low point of said internal volume when said device is oriented in a cell removal position.

14. The device of claim 1 wherein said medium removal conduit does not include a filter to keep cells from entering said medium removal conduit.

15. The device of claim 1 including cells and media within the device, the device in a location with ambient gas suitable for cell culture and oriented in the static cell culture position.

16. A method of culturing animal cells with
a gas permeable cell culture and cell recovery device having an internal volume bounded at least in part by a growth surface and an opposing upper confine, said growth surface comprised of liquid impermeable gas permeable material, at least a portion of said gas permeable material in contact with ambient gas,

a vent,

a medium removal conduit including a medium removal opening,

a cell removal conduit including a cell removal opening,

the method comprising:

adding animal cells and media into the device, and culturing cells with said gas permeable cell culture device in a location with ambient gas suitable for cell culture,

oriented in a static culture position wherein said growth surface is below said upper confine, said gas permeable material is in a horizontal position, the distance from said growth surface to said cell removal opening is less than the distance from said growth surface to said medium removal opening; and the maximum distance from the upper confine to the growth surface is the maximum potential medium height of the internal volume.

17. A gas permeable cell culture and cell recovery device for static cell culture comprising:

a cell culture compartment bounded by a growth surface and an opposing upper confine, said growth surface comprised of liquid impermeable gas permeable material, at least a portion of said gas permeable material in contact with ambient gas,

a vent,

a medium removal conduit including a medium removal opening,

a cell removal conduit including a cell removal opening,

and when the device is oriented in the static culture position the growth surface is in a horizontal position and is located at an elevation lower than that of the opposing upper confine, the distance from said growth surface to said cell removal opening is less than the distance from said growth surface to said medium removal opening, and the cell culture compartment is capable of holding media in the cell culture compartment wherein the uppermost location of the media is at a height beyond 2.0 cm from the lowermost location of the media.

18. The device of claim 17 including cells and media within the device, the device in a location with ambient gas suitable for cell culture and oriented in the static cell culture position.

19. A method of culturing animal cells with
a gas permeable cell culture and cell recovery device for static cell culture
comprising:

a cell culture compartment bounded by a growth surface and an opposing upper
confine, said growth surface comprised of liquid impermeable gas permeable material,
at least a portion of said gas permeable material in contact with ambient gas,

a vent,

a medium removal conduit including a medium removal opening,

a cell removal conduit including a cell removal opening,

and when the device is oriented in the static culture position the growth surface
is in a horizontal position and is located at an elevation lower than that of the opposing
upper confine, the distance from said growth surface to said cell removal opening is less
than the distance from said growth surface to said medium removal opening, and the
cell culture compartment is capable of holding media in the cell culture compartment
wherein the uppermost location of the media is at a height beyond 2.0 cm from the
lowermost location of the media; the method comprising adding animal cells and media
into the device and orientating said device in the static culture position in a location
with ambient gas suitable for cell culture.

20. The method of claim 19 wherein said animal cells are comprised of T cells.

21. The method of claim 20 wherein said animal cells are comprised of feeder
and/or antigen presenting cells.