CLAIMS

1. A method comprising:

seeding cells of a non-human animal species on an at least partially compressible filter aid, wherein the at least partially compressible filter aid comprises a plurality of separate particles or fibers;

compressing the cells, the at least partially compressible filter aid, or both;

flowing media through the at least partially compressible filter aid to grow the cells into a cell biomass, whereby growth reduces perfusion over time; and

decompressing the cells, the at least partially compressible filter aid, or both, to increase perfusion of media.

2. The method of claim 1, wherein the cell biomass is compressed by a fluid pressure or flow of the media.

3. The method of claim 1, wherein the media provides nutrients and oxygenation to promote cell growth.

4. The method of claim 1, wherein decompressing the cells, the at least partially compressible filter aid, or both comprises utilizing at least one of a relief valve, a lower pressure media flow, or a flow reduction of the media.

5. The method of claim 1, wherein the cell biomass, its substrate, or both are decompressed proportionally to the growth of the cell biomass, whereby perfusion is stabilized.

6. The method of claim 1, wherein the cell biomass, the at least partially compressible filter aid, or both cycle between a compressed state and a decompressed state at a pulsing frequency.

7. The method of claim 6, wherein the pulsing frequency is between 20 seconds to 20 minutes.

8. A method comprising:

providing a filter support;

adding at least one filter aid to the filter support, wherein the at least one filter aid is added to the filter support at between 25g/m^2 - 12000g/m^2, 50g/m^2 - 6000g/m^2, 100g/m^2 - 3000g/m^2, 200g/m^2 - 1500g/m^2, or 400g/m^2 - 750g/m^2, wherein the at least one filter aid comprises a plurality of separate particles or fibers;

adding a plurality of cells of a non-human animal species to the at least one filter aid, wherein the plurality of cells and the at least one filter aid together comprise a filter cake; and

culturing the plurality of cells in the filter cake by perfusing the filter cake with media.

9. The method as in claim 8, wherein the at least one filter aid is selected from the group consisting of cellulose, starch, diatomaceous earth, perlites, active charcoal, plant fibers, fungal mycella, algae, and organic fiber.

10. The method as in claim 9, wherein the organic fiber comprises a length of between 1µm - 20 µm, 20µm - 50 µm, 50µm - 80µm, 80µm - 110µm, 110µm - 140 µm, 140µm - 170 µm, 170µm - 200µm, 200µm - 230 µm, 230µm - 260 µm, 260µm - 290µm, or 290µm - 320 µm.

11. The method as in claim 9, wherein the organic fiber has a fiver titer of between 0.01dtex - 120dtex, 0.05dtex - 60dtex, 0.1dtex - 30dtex, 0.2dtex - 15dtex, or 0.5dtex - 5 dtex.

12. The method as in claim 8, wherein a density of cells in the filter cake is between 0.05x10^6 cells/ml - 2000x10^6 cells/ml, 0.5x10^6 cells/ml - 200x10^6 cells/ml, 5x10^6 cells/ml - 20x10^6 cells/ml, or 5x10^6 cells/ml - 10x10^6 cells/ml.

13. A system for cultivating cells and cell biomass, the system comprising:

a filter chamber comprising at least one inlet and at least one outlet;

at least one filter support located within the filter chamber, wherein at least one filter aid is added to the at least one filter support at between $25g/m^2$ - $12000g/m^2$, $50g/m^2$ - $6000g/m^2$, $100g/m^2$ - $3000g/m^2$, $200g/m^2$ - $1500g/m^2$, or $400g/m^2$ - $750g/m^2$, wherein the at least one filter aid comprises a plurality of separate particles or fibers; and

a filter cake located on the at least one filter support, wherein the filter cake comprises at least one filter aid and a plurality of cells of a non-human animal species.

14. The system as in claim 13, wherein the filter cake comprises at least two different cell types.

15. The system as in claim 13, wherein the cells are selected from the group consisting of skeletal muscle cells, stem cells, pluripotent stem cells, embryonic stem cells, induced pluripotent stem cells, fibroblasts, myoblasts, somatic cells, extraembryonic cells, myocytes, satellite cells, side population cells, muscle derived stem cells, mesenchymal stem cells, myogenic pericytes, mesoangioblasts, and adipocytes.