

What is claimed is:

1. A tangential flow filtration system comprising:
 - a tangential flow filtration module;
 - a storage vessel comprising an input composition;
 - a tangential flow filtration input supply tube configured to deliver input composition from multiple depths within the storage vessel to the tangential flow filtration module, wherein the tangential flow filtration input supply tube comprises a plurality of inlet ports disposed at different heights within the storage vessel; and
 - a retentate return tube configured to return TFF retentate from the tangential flow filtration module to the storage vessel.
2. The tangential flow filtration system of claim 1 further comprising a recirculation system separate from the tangential flow filtration module and comprising a recirculation tube having a recirculation tube inlet disposed within the storage vessel at a depth selected to extract contents of the storage vessel and having a recirculation tube outlet disposed inside the storage vessel, wherein the recirculation system is configured such that anything in the recirculation system does not pass through the tangential flow filtration module and wherein the recirculation tube inlet and the recirculation tube outlet are located within in the storage vessel such that passage of the contents of the storage vessel through the recirculation system inhibits concentration gradients within the storage vessel.
3. A tangential flow filtration (TFF) system comprising:
 - a tangential flow filtration (TFF) module;
 - a storage vessel comprising an input composition;
 - a tangential flow filtration input supply tube operably connected to deliver input composition from the storage vessel to the tangential flow filtration module; and
 - a retentate return tube operably connected to return TFF retentate from the tangential flow filtration module to the storage vessel;

wherein the TFF system further comprises:

a recirculation system separate from the tangential flow filtration module and comprising a recirculation tube having a recirculation tube inlet disposed within the storage vessel at a depth selected to extract contents of the storage vessel and having a recirculation tube outlet disposed inside the storage vessel, wherein the recirculation system is configured such that anything in the recirculation system does not pass through the tangential flow filtration module and wherein the recirculation tube inlet and the recirculation tube outlet are located within in the storage vessel such that passage of the contents of the storage vessel through the recirculation system inhibits concentration gradients within the storage vessel.

4. The tangential flow filtration system of claim 2 or 3 wherein the recirculation tube inlet and the recirculation tube outlet are not connected to any tangential flow filtration module inlet or tangential flow filtration module outlet.
5. The tangential flow filtration system of any one of claims 2 to 4 wherein the recirculation system further comprises a recirculation system pump disposed to pump the contents of the storage vessel through the recirculation system, the recirculation system pump not connected to the tangential flow filtration module.
6. The tangential flow filtration system of any one of claims 2 to 5 wherein a single supply tube is configured to extract the contents of the storage vessel from the storage vessel and deliver the contents of the storage vessel to both the tangential flow filtration module and the recirculation system.
7. The tangential flow filtration system of any one of claims 2 to 6 wherein the recirculation system further comprises a recirculation return tube.
8. The tangential flow filtration system of any one of claims 2 to 7 wherein the recirculation supply tube comprises at least one additional inlet hole disposed along the length of the recirculation supply tube.
9. The tangential flow filtration system of any of claims 1 to 8 wherein the tangential flow filtration supply tube and the retentate return tube terminate at different depths in the interior of the storage vessel.

10. The tangential flow filtration system of any of claims 1 to 8 wherein the input composition fills the storage vessel to a desired storage vessel fill height.
11. The tangential flow filtration system of claim 10 wherein the retentate return tube terminates in the interior of the storage vessel above the storage vessel fill height.
12. The tangential flow filtration system of claim 10 wherein the retentate return tube terminates in the interior of the storage vessel below the storage vessel fill height.
13. The tangential flow filtration system of claim 10 wherein the retentate return tube terminates in the interior of the storage vessel proximate a bottom of the storage vessel.
14. The tangential flow filtration system of claims 10 to 13 wherein the retentate return tube is directed towards a side in the interior of the storage vessel.
15. The tangential flow filtration system of any of claims 2 to 8 wherein input composition fills the storage vessel to a desired storage vessel fill height.
16. The tangential flow filtration system of claim 15 wherein the recirculation return tube terminates in the interior of the storage vessel above the storage vessel fill height.
17. The tangential flow filtration system of claim 15 wherein the recirculation return tube terminates in the interior of the storage vessel below the storage vessel fill height.
18. The tangential flow filtration system of claim 15 wherein the recirculation return tube terminates in the interior of the storage vessel proximate a bottom of the storage vessel.
19. The tangential flow filtration system of claims 15 to 18 wherein the recirculation return tube is directed towards a side in the interior of the storage vessel.
20. The tangential flow filtration system of any of claims 1 to 19 further comprising a diafiltration solution supply tube configured to deliver diafiltration solution to the retentate return tube upstream from the storage vessel.
21. The tangential flow filtration system of any of claims 1 to 20 wherein the tangential flow filtration system and tangential flow filtration module are configured to retain and filter a viscous composition without a substantial concentration gradient in the viscous composition.

22. The tangential flow filtration system of claim 21 wherein the viscous composition is a viscous solution.
23. The tangential flow filtration system of claim 22 wherein the viscous solution has a viscosity of between 20 centipoise and 1000 centipoise.
24. The tangential flow filtration system of claim 22 wherein the viscous solution has a viscosity of between 10 centipoise and 200 centipoise.
25. The tangential flow filtration system of any of claims 1 to 24 further comprising a storage vessel cap, wherein the tangential flow filtration input supply tube and the retentate return tube extend through the storage vessel cap into the interior of the storage vessel.
26. The tangential flow filtration system of claim 25 wherein the storage vessel cap seals aseptically to the top of the storage vessel.
27. The tangential flow filtration system of claim 25 wherein the storage vessel cap is made of at least one of a pharmaceutical grade material and a medical device grade material.
28. A method for the tangential flow filtration of an input composition, the method comprising:
 - providing the input composition in a storage vessel, the storage vessel having a top, a bottom, at least one side and an interior and the input composition filling the storage vessel to a desired storage vessel fill height;
 - providing a tangential flow filtration module;
 - extracting the input composition from different depths in the storage vessel;
 - subjecting the extracted input composition to tangential flow filtration to produce a tangential flow filtration retentate; and
 - returning the tangential flow filtration retentate to the interior of the storage vessel.
29. The method of claim 28 further comprising mixing the input composition in the storage vessel by extracting and returning the input composition from and to the storage vessel.

30. The method of any of claims 28 or 29 further comprising mixing the tangential flow filtration retentate with a diafiltration solution before returning the tangential flow filtration retentate to the storage vessel.
31. The method of any of claims 28 to 30 wherein providing the input composition comprises providing a viscous composition.
32. The method of claim 31 wherein providing the viscous composition comprises providing a viscous solution.
33. The method of claim 32 wherein the viscous solution has a viscosity of between 20 centipoise and 1000 centipoise.
34. The method of claim 32 wherein the viscous solution has a viscosity of between 10 centipoise and 200 centipoise.
35. The method of any of claims 28 to 34 wherein returning the tangential flow retentate to the storage vessel comprises returning the tangential flow filtration retentate to the interior of the storage vessel above the storage vessel fill height.
36. The method of any of claims 28 to 34 wherein returning the tangential flow retentate to the storage vessel comprises returning the tangential flow filtration retentate to the interior of the storage vessel below the storage vessel fill height.
37. The method of any of claims 28 to 34 wherein returning the tangential flow retentate to the storage vessel comprises returning the tangential flow filtration retentate to the interior of the storage vessel proximate the bottom of the storage vessel.
38. The method of any of claims 28 to 37 wherein returning the tangential flow retentate to the storage vessel comprises directing the tangential flow filtration retentate towards a side on the interior of the storage vessel.
39. The method of claim 29 wherein mixing the input composition comprises extracting the input composition from different depths within the storage vessel.
40. The method of claim 29 wherein mixing the input composition comprises returning the input composition to the interior of the storage vessel above the storage vessel fill height.

41. The method of claim 29 wherein mixing the input composition comprises returning the input composition to the interior of the storage vessel below the storage vessel fill height.
42. The method of claim 29 wherein mixing the input composition comprises returning the input composition to the interior of the storage vessel proximate the bottom of the storage vessel.
43. The method of any of claim 29 and claims 40 to 42 wherein mixing the input composition comprises directing the input composition towards a side on the interior of the storage vessel.