Claims:

1. A tangential flow filtration (TFF) cassette, comprising:

a flexible isolation plate;

at least one of a gasket and a filter plate; and

disposed between the flexible isolation plate and the gasket or filter plate, a plurality of interleaved layers defining at least one membrane, at least one feed channel and at least one filtrate channel, the plurality of interleaved layers comprising:

a filtrate channel spacer defining an open interior volume bounded by an inner perimeter and including one or more fluid ports;

a non-flexible feed channel spacer defining an open interior volume bounded by an inner perimeter and including one or more fluid ports;

a membrane disposed between the filtrate channel spacer and the feed channel spacers; and, optionally,

a thin film of pressure sensitive adhesive binding together the membrane and one of the filtrate channel spacer and the feed channel spacer, said thin film of pressure sensitive adhesive having a thickness of less than 50% of height of an adjacent filtrate or feed channel;

wherein (a) the flexible isolation plate comprises a flexible polymer or a thermoplastic elastomer and is bonded to a first surface of the interleaved layers ~~stack~~ and (b) the membrane comprises a plurality of track-etched (TE) membranes, wherein the membranes comprise a plurality of pores, and wherein the pores are uniform in size and shape.

2. The cassette of claim 1, wherein the plurality of pores are uniform in diameter, depth, and/or path length.
3. The cassette of claim 1 or 2, wherein the average pore size is ~~about~~ 100kD to ~~about~~ 30 micron.
4. The cassette of any one of claims 1-4, wherein the TE membrane has a thickness up to 60 microns.
5. The cassette of claim 1, wherein the track-etched membranes comprise a plurality of polycarbonate, polyimide, polyvinylidene fluoride or polyester flat sheets.
6. The cassette of claim 1, wherein the plurality of pores may have one or more of the following structures: cylinder, cone, cigar, funnel and hour glass.
7. ~~The cassette of any of claims 1-6, wherein the track-etched membranes have a smooth surface.~~
8. 7. The cassette of any one of claims 1-6~~7~~, wherein the cassette is used in alternating tangential flow filtration.
9. 8. The cassette of any one of claim 1-7~~8~~, wherein a gasket is bonded to a second surface of the interleaved stack, the gasket comprising separate fluid ports for the feed and filtrate channels.

~~10.~~9. The cassette of any one of claims 1-~~8~~9, wherein a filter plate is bonded to the gasket, the filter plate comprising a fluid manifold wherein a feed port of the filter plate is aligned with a feed port of the gasket, and a filtrate port of the filter plate is aligned with a filtrate port of the gasket.

~~11.~~10. The cassette of any one of claims 1-~~9~~10, further comprising a tab or an engraving on a sidewall of the cassette to identify the TFF cassette by one or more of a stock keeping unit (SKU) number, a lot number, a serial number, a capacity, a number of feed and/or filtrate channels, and a number of membranes.

~~12.~~11. The cassette of claim ~~1~~10, wherein the tab or engraving comprises a barcode.

~~13.~~12. The cassette of any one of claims 1-~~11~~12, wherein the TFF cassette is disposable after use.

~~14.~~13. The cassette of any one of claims 1-~~11~~12, wherein the TFF cassette is reusable.

~~15.~~14. The cassette of any one of claims 1-~~13~~14, wherein the TFF cassette comprises a sealed edge.

~~16.~~15. The cassette of any one of claims 1-~~14~~15, wherein the at least one feed channel comprises a feed screen disposed within a space defined by the feed channel spacer.

~~17.~~16. The cassette of claim15 ~~16~~, wherein the feed screen comprises a woven, non-woven or extruded polymer mesh.

~~18.~~17. The cassette of claim 15~~16~~ or 16~~17~~, wherein the at least one filtrate channel comprises a filtrate screen disposed within a space defined by the filtrate channel spacer.

~~19.~~18. The cassette of claim17 ~~18~~, wherein the filtrate screen comprises a woven, non-woven or extruded polymer mesh.

~~20.~~19. A method for the filtration of a cell culture, comprising:

using a cassette, wherein the cassette comprises:

a flexible isolation plate;

at least one of a gasket and a filter plate; and

disposed between the flexible isolation plate and the gasket or filter plate, a plurality of interleaved layers defining at least one feed channel and at least one filtrate channel, the plurality of interleaved layers comprising:

a filtrate channel spacer defining an open interior volume bounded by an inner perimeter and including one or more fluid ports;

a non-flexible feed channel spacer defining an open interior volume bounded by an inner perimeter and including one or more fluid ports;

a membrane disposed between the filtrate channel spacer and the feed channel spacers; and, optionally,

a pressure sensitive adhesive binding together the membrane and one of the filtrate channel spacer and the feed channel spacer, said thin film of pressure sensitive adhesive having a thickness of less than 50% of height of an adjacent channel;

wherein (a) the flexible isolation plate comprises a flexible polymer or a thermoplastic elastomer and is bonded to a first surface of the interleaved stack and (b) the membrane comprises a plurality of track-etched membranes, wherein the membranes comprise a plurality of pores, and wherein the pores are uniform in size and shape;

connecting the cassette housing to a process vessel;

connecting the cassette housing to a separation system;

circulating a cell culture through the track etched membrane filter and separation system;

filtering the cell culture through the membrane filter;

collecting the resulting filtrate; and

returning the cell culture to the process vessel.

~~21.~~20. The method of claim19 ~~20~~, wherein the cell culture is a mammalian cell culture.

~~22.~~21. The method of claim 19~~20~~ or 20~~21~~, wherein the circulation of the cell culture is performed by alternating tangential flow.

~~23.~~22. The method of claim 19~~20~~ or 20~~21~~, wherein the circulation of the cell culture is performed by tangential flow filtration.