CLAIMS

1. A single pass tangential flow filtration system, the system comprising:

a single pass tangential flow filtration unit configured to be fluidly connected to one or more preceding systems and one or more subsequent systems, wherein:

the single pass tangential flow filtration unit comprises one or more membranes or membrane devices in a one- or two-stage configuration, and

a pressure drop across the one or more membranes or membrane devices is less than or equal to 30psi.

2. The single pass tangential flow filtration system of claim 1, wherein the pressure drop across the one or more membranes or membrane devices is less than 20psi.

3. The single pass tangential flow filtration system of claim 1 or 2, wherein the single pass tangential flow filtration unit is configured to be connected to the one or more preceding systems by a feed flow inlet configured to receive a feed stream, and

optionally wherein the single pass tangential flow filtration unit is configured to be connected to the one or more subsequent systems by one or more retentate flow outlets each configured to output a retentate stream.

4. The single pass tangential flow filtration system of any one of claims 1-3, wherein the system is positioned on a mobile platform, and optionally wherein no pump is provided between the single pass tangential flow filtration unit and the one or more preceding systems.

5. The single pass tangential flow filtration system of claim 3 or 4, further comprising a controller in electrical communication with one or more sensors, the one or more sensors provided on a feed line in fluid communication with the feed flow inlet, one or more permeate lines in fluid communication with the one or more permeate outlets, and one or more retentate lines in fluid communication with the one or more retentate outlets,

optionally wherein the controller is configured to control a volumetric concentration factor based on a determined volumetric concentration factor,

optionally wherein the volumetric concentration factor is determined based on a reading from a first sensor and a second sensor of the one or more sensors and/or based upon a ratio of a measured flow rate of the feed stream to a measured flow rate of the retentate stream, wherein the respective flow rates are measured by the first and second sensors,

optionally wherein the first sensor is a flow meter provided on the feed line in fluid communication with the feed flow inlet and the second sensor is a flow meter provided a retentate flow line of one or more retentate flow lines in fluid communication with one or more of the retentate outlets,

optionally wherein the first sensor is a protein concentration sensor provided on the feed line in fluid communication with the feed flow inlet and the second sensor is a protein concentration sensor provided a retentate flow line of one or more retentate flow lines in fluid communication with one or more of the retentate outlets, and wherein the volumetric concentration factor is determined based upon a ratio of a measured protein concentration of the retentate stream to a measured protein concentration of the feed stream, wherein the respective protein concentrations are measured by the first and second sensors.

6. The single pass tangential flow filtration system of claim 5, wherein controlling the volumetric concentration factor comprises:

in accordance with determining that the volumetric concentration factor is outside of a threshold range based on the determined volumetric concentration factor, adjusting a flow rate of the permeate stream to bring the volumetric concentration factor within the threshold range, optionally wherein the threshold range is between 1.0 and 3.0, including 1.0 and 3.0, and optionally wherein the threshold range is between 1.5 and 2.5, including 1.5 and 2.5.

7. The single pass tangential flow filtration system of claim 6, wherein adjusting a flow rate of the permeate stream to bring the volumetric concentration factor within the threshold range comprises:

activating or deactivating one or more permeate control pumps provided on one or more of the one or more permeate lines downstream of the one or more permeate outlets,

increasing a displacement of a variable displacement pump of the one or more variable displacement pumps,

decreasing a displacement of a variable displacement pump of the one or more variable displacement pumps, or

adjusting a valve provided on one or more permeate lines downstream of the one or more permeate outlets,

optionally wherein one or more of the permeate control pumps include one or more variable displacement pumps or one or more fixed displacement pumps, and optionally wherein adjusting the valve comprises opening the valve or closing the valve.

8. The single pass tangential flow filtration system of any one of claims 5-7, wherein the one or more sensors comprise a flow meter, a pressure sensor, a temperature sensor, and a protein concentration sensor.

9. The single pass tangential flow filtration system of any one of claims 1-8, wherein the single pass tangential flow filtration unit comprises one or more membranes or membrane devices in a one stage configuration,

optionally wherein the one stage configuration is configured to receive a feed stream from the feed flow inlet and separate the feed stream into a retentate stream and a permeate stream by allowing a portion of the feed stream to pass through one or more membranes or membrane devices, the portion passing through the one or more membranes or membrane devices forming the permeate stream.

10. The single pass tangential flow filtration system of any one of claims 1-8, wherein the single pass tangential flow filtration unit comprises one or more membranes or membrane devices in a two-stage configuration,

optionally wherein the two-stage configuration is configured to receive a feed stream from the feed flow inlet and separate the feed stream into a retentate stream and a permeate stream by allowing a portion of the feed stream to pass through one or more membranes or membrane devices of a first stage and one or more membranes or membrane devices of a second filtration stage, the portion passing through the one or more membranes of the first and second stage forming the permeate stream.

11. The single pass tangential flow filtration system of any one of claims 3-10, wherein the operating temperature of the feed stream is between 2 degrees Celsius and 30 degrees Celsius, including 2 degrees Celsius and 30 degrees Celsius, or between 1 degree Celsius and 3 degrees Celsius, including 1 degree Celsius and 3 degrees Celsius.

12. The single pass tangential flow filtration system of any one of claims 3-10, wherein the operating temperature of the feed stream is less than or equal to 20 degrees Celsius, less than or equal to 15 degrees Celsius, less than or equal to 10 degrees Celsius, or less than or equal to 5 degrees Celsius.

13. The single pass tangential flow filtration system of any one of claims 1-12, wherein the one or more preceding systems comprise a purification system or a harvest system,

optionally wherein the one or more subsequent systems comprise a purification system,

optionally wherein the purification system comprises a viral filtration system, a chromatography system, a diafiltration system, an ultrafiltration system.

14. The single pass tangential flow filtration system of any one of claims 3-13, wherein the feed flow comprises a polypeptide preparation, optionally wherein the polypeptide preparation comprises a polypeptide and one or more impurities.

15. A single pass tangential flow filtration method, the method comprising:

receiving a feed flow at a feed flow inlet of a single pass tangential flow filtration unit, wherein the single pass tangential flow filtration unit comprises one or more membranes or membrane devices in a one- or two-stage configuration, and wherein a pressure drop across the one or more membranes or membrane devices is less than or equal to 30psi;

separating, using the one or more membranes or membrane devices, the feed stream into a permeate stream and a retentate stream; and

outputting the permeate stream through one or more permeate outlets and the retentate stream through one or more retentate outlets.