What is Claimed is:

1. A continuous parallel chromatography system, the system comprising:

a plurality of chromatography column skids, each chromatography column skid suitable for independent batch processing and comprising:

a chromatography column;

an inlet selectively coupled to an upstream source;

at least one pump;

at least one filter; and

an outlet sensor;

a control circuit configured to control the operation of the plurality of chromatography column skids through one or more full cycles of a chromatography process, each full cycle including a long step and a plurality of shorter steps, each of the plurality of shorter steps having a processing time shorter than or equal to a processing time of the long step, wherein the control circuit is configured to:

receive a synchronization signal associated with a first one of the plurality of chromatography column skids that the long step is complete; and

in response to reception of the synchronization signal, direct operation of a second one of the plurality of chromatography column skids to commence operation of the long step.

2. The system of claim 1, wherein the control circuit is further configured to direct operation of the plurality of shorter steps on the first one of the plurality of chromatography column skids to complete the full cycle of the chromatography process therefor after reception of the synchronization signal.

3. The system of claim 2, wherein the control circuit is further configured to:

receive a second synchronization signal associated with the second one of the plurality of chromatography column skids that the long step is complete; ~~and~~

in response to reception of the second synchronization signal, direct operation of the first one of the plurality of chromatography column skids to commence a second operation of the long step; and

direct operation of the plurality of shorter steps on the second one of the plurality of chromatography column skids to complete the full cycle of the chromatography process therefor after reception of the second synchronization signal.

~~4. The system of claim 3, wherein the control circuit is further configured to direct operation of the plurality of shorter steps on the second one of the plurality of chromatography column skids to complete the full cycle of the chromatography process therefor after reception of the second synchronization signal.~~

4~~5~~. The system of any one of the preceding claims, wherein the long step comprises an eluting step for the chromatography column; and the plurality of shorter steps comprise two or more of: an equilibrium step, a loading step, one or more washing steps, regeneration step, or a flushing step.

~~6. The system of claim 5, wherein the plurality of shorter steps comprise two or more of: an equilibration step, a loading step, one or more washing steps, a regeneration step, or a flushing step.~~

5~~7~~. The system of any one of the preceding claims ~~1 to 4~~, wherein the long step comprises a loading step for the chromatography column; and the plurality of shorter steps comprise two or more of: an equilibrium step, one or more washing steps, an elution step, a regeneration step, or a flushing step.

~~8. The system of claim 7, wherein the plurality of shorter steps comprise two or more of: an equilibration step, one or more washing steps, an elution step, a regeneration step, or a flushing step.~~

6~~9~~. The system of claim 5~~7 or 8~~, wherein:

the first one of the plurality of chromatography column skids is configured to receive a feed of feedstock from the upstream source and send the synchronization signal to the control circuit indicating that a load of the feedstock in the chromatography column of the first one of the plurality of chromatography columns is complete; and

in response to reception of the synchronization signal, the control circuit is configured to switch the feed of the feedstock from the upstream source to the second one of the plurality of chromatography column skids to perform the loading step for the chromatography column thereof.

7~~10~~. The system of claim 6~~9~~, wherein the control circuit is further configured to direct a feed of one or more processing feedstocks to the first one of the plurality of chromatography column skids to perform processing of the short steps on the loaded chromatography column thereof.

8~~11~~. The system of claim 7~~10~~, wherein, after completion of the processing of the short steps on the loaded chromatography column, the first one of the plurality of chromatography column skids is configured to await a generation of a second synchronization signal associated with the second chromatography column skid that the loading step for the chromatography column thereof is complete.

9~~12~~. The system of any one of claims 6~~9~~ to 8~~11~~, wherein the feedstock comprises a protein, an antibody, a multispecific protein, a bispecific protein, or a bi-specific T cell engager.

10~~3~~. The system of any one of claims 6~~9~~ to 8~~11~~, wherein the upstream source of the feedstock comprises one of: a stream or pool of harvested cell culture fluid, an elution stream or pool from a capture chromatography column, a viral inactivated pool from a capture chromatography column, or a neutralized viral inactivated pool from a capture chromatography column.

11~~4~~. The system of any one of the preceding claims, wherein the chromatography columns of the plurality of chromatography skids comprise capture chromatography columns comprising one or more of: affinity chromatography columns, size exclusion chromatography columns, ion exchange chromatography columns, hydrophobic interaction chromatography columns, multi-modal chromatography columns, hydroxyapatite chromatography columns, or immobilized metal affinity chromatography columns.

~~15. The system of claim 14, wherein the capture chromatography columns comprise one or more of: affinity chromatography columns, size exclusion chromatography columns, ion exchange chromatography columns, hydrophobic interaction chromatography columns, multi-modal chromatography columns, hydroxyapatite chromatography columns, or immobilized metal affinity chromatography columns.~~

126. The system of claim 115, wherein the capture chromatography columns comprise affinity chromatography columns consisting of Protein A chromatography columns, Protein G chromatography columns, or Protein L chromatography columns; or ion exchange chromatography columns consisting of cation exchange chromatography columns or anion exchange chromatography columns.

~~17. The system of claim 15, wherein the capture chromatography columns comprise ion exchange chromatography columns consisting of cation exchange chromatography columns or anion exchange chromatography columns.~~

138. The system of any one of the preceding claims, further comprising at least one of a viral filtration device and/or an ultrafiltration device fluidly connected downstream of the plurality of chromatography column skids.

149. The system of any one of the preceding claims, wherein the control circuit comprises:

a plurality of controllers of each of the plurality of chromatography column skids in communication with one another; or

a central controller in communication with each of the plurality of chromatography column skids.

~~20. The system of any one of claims 1 to 18, wherein the control circuit comprises a central controller in communication with each of the plurality of chromatography column skids.~~

1521. The system of any one of the preceding claims, wherein the chromatography columns of the plurality of chromatography column skids have a plurality of different sizes relative to one another.

1622. The system of any one of the preceding claims, wherein one or more of the chromatography columns of the plurality of chromatography column skids comprise single-use chromatography columns.

1723. The system of any one of the preceding claims, further comprising:

one or more collection tanks fluidly coupled downstream of the plurality of chromatography column skids; and

a downstream capture chromatography column.

~~24. The system of claim 23, further comprising a downstream capture chromatography column.~~

1825. The system of claim 1724, wherein the downstream chromatography column comprises an ion exchange chromatography column, a hydrophobic interaction chromatography column, a multi-modal chromatography column, or a hydroxyapatite chromatography column.

~~26. The system of claim 25, wherein the downstream chromatography column comprises a cation exchange or anion exchange column.~~

1927. The system of ~~any one of~~ claim~~s~~ 1724 or~~to~~ 1826, wherein the downstream chromatography column comprises a first downstream chromatography column; and further comprising a second downstream chromatography column connected directly in series with the first downstream chromatography column.

~~28. The system of claim 27, wherein the first and second downstream chromatography columns comprise cation and/or anion exchange columns.~~

2~~0~~9. The system of any one of claims 17~~2~~24 to 19~~2~~26, wherein:

the downstream chromatography column comprises a first downstream chromatography column; and further comprising a second downstream chromatography column;

~~wherein~~ the first and second downstream chromatography columns are disposed on first and second downstream chromatography column skids, respectively, the first and second downstream chromatography column skids each suitable for independent batch processing and comprising:

an inlet;

at least one pump;

at least one filter; and

an outlet sensor;

the control circuit is configured to control operation of the first and second downstream chromatography column skids through one or more full cycles of a downstream chromatography process, each full cycle including a long elution step and a plurality of shorter steps, each of the plurality of shorter steps having a processing time shorter than or equal to a processing time of the long elution step, wherein the control circuit is configured to:

receive a synchronization signal associated with the first downstream chromatography column skid that the long elution step is complete; and

in response to reception of the synchronization signal, direct operation of the second chromatography column skid to commence operation of the long elution step.

~~30. The system of claim 29,~~

~~wherein the control circuit is configured to control operation of the first and second downstream chromatography column skids through one or more full cycles of a downstream chromatography process, each full cycle including a long elution step and a plurality of shorter steps, each of the plurality of shorter steps having a processing time shorter than or equal to a processing time of the long elution step, wherein the control circuit is configured to:~~

~~receive a synchronization signal associated with the first downstream chromatography column skid that the long elution step is complete; and~~

~~in response to reception of the synchronization signal, direct operation of the second chromatography column skid to commence operation of the long elution step.~~