WHAT IS CLAIMED IS:

1. A bioprocessing system, comprising:

a first module configured for enriching and isolating a population of cells;

a second module configured for activating, genetically modifying, and expanding the population of cells; and

a third module configured for harvesting the expanded population of cells.

2. The bioprocessing system of claim 1, wherein:

the second module contains a bioreactor vessel configured to provide for the genetic modification and expansion of the population of cells without removal of the population of cells from the bioreactor vessel, or

the second module contains a bioreactor vessel configured to provide for the activation, genetic modification and expansion of the population of cells without removal of the population of cells from the bioreactor vessel.

3. The bioprocessing system of claim 1, wherein:

the second module includes a first bioreactor vessel and a second bioreactor vessel fluidly interconnected with the first bioreactor vessel.

4. The bioprocessing system of claim 3, wherein:

the first bioreactor vessel is configured for carrying out activation and genetic modification of the population of cells;

wherein the second bioreactor vessel is configured for carrying out expansion of the population of cells.

5. The bioprocessing system of claim 4, wherein the bioprocessing system is configured to effect activation and genetic modification of the cells in the first bioreactor vessel, transfer of the cells from the first bioreactor vessel to the second bioreactor vessel, and expansion of the cells in the second bioreactor vessel in an autonomous manner.

6. The bioprocessing system of claim 3, wherein:

the first bioreactor vessel is configured for performing activation of the population of cells; and

the second bioreactor vessel is configured for performing genetic modification and expansion of the population of cells.

7. The bioprocessing system of claim 4, wherein:

the bioreactor vessel is configured for filterless perfusion.

8. The bioprocessing system of claim 1, wherein:

the population of cells is a first population of cells; and

wherein the bioprocessing system is configured to support activation, genetic modification and expansion of the first population of cells in the second module simultaneously with enrichment and isolation of a second population of cells in the first module,

wherein the first population of cells is different from the second population of cells.

9. The bioprocessing system of claim 1, further comprising:

a plurality of second modules, each second module configured for activating, genetically modifying and expanding the cells;

wherein each second module is configured to support activation, genetic modification and expansion of different populations of cells in parallel.

10. The bioprocessing system of claim 9, wherein:

the first module is configured for enrichment and isolation of each different population of cells prior to transfer to one of the plurality of second modules for activation, genetic modification and expansion.

11. The bioprocessing system of claim 10, wherein:

the bioprocessing system is configured to perform enrichment and isolation of one of the different populations of cells in the first module simultaneously with activation, genetic modification and expansion of another of the different populations of cells in the second module.

12. A bioprocessing method for cell therapy, the method comprising:

in a first module, enriching and isolating a population of cells;

in a second module, activating, genetically modifying, and expanding the population of cells; and

in a third module, harvesting the expanded population of cells.

13. The bioprocessing method according to claim 12, wherein:

the step of activating, genetically modifying and expanding the population of cells in the second module includes activating and genetically modifying the population of cells in a first bioreactor vessel of the second module, transferring the population of cells to a second bioreactor vessel of the second module, and expanding the population of cells in the second bioreactor vessel.

14. The bioprocessing method according to claim 12, wherein:

the step of activating, genetically modifying and expanding the population of cells in the second module includes activating the population of cells in a first bioreactor vessel of the second module, transferring the population of cells to a second bioreactor vessel of the second module, and genetically modifying and expanding the population of cells in the second bioreactor vessel.

15. The bioprocessing method according to claim 12, wherein:

the step of activating, genetically modifying and expanding the population of cells in the second module includes activating, genetically modifying and expanding the population of cells in a first and second bioreactor vessel of the second module.

16. The bioprocessing method according to claim 12, wherein:

the population of cells is a first population of cells; and

wherein the method further includes the steps of transferring the first population of cells from the first module to the second module after enrichment and isolation of the first population of cells in the first module, for activation, genetic modification and expansion of the first population of cells in the second module; and

introducing a second population of cells into the first module for enrichment and isolation of the second population of cells in the first module simultaneously with the activation, genetic modification and expansion of the first population of cells in the second module,

wherein the first population of cells is different from the second population of cells.