CLAIMS

1. A system for seeding cells comprising:

a cellular isolate fluid container;

a flow channel disposed between the cellular isolate fluid container, a collection fluid container, an elution fluid container, and a seeding container, wherein the flow channel comprises an inlet, an outlet and a filter therebetween,

wherein the filter is adapted to allow flow in at least two directions, and wherein the flow channel is selectively in fluid communication with each of the cellular isolate fluid container, the collection fluid container, the elution fluid container, and the seeding container, respectively; and wherein the seeding container comprises a cell seeding assembly.

2. The system of claim 1, wherein a housing comprises the flow channel, inlet, outlet, and filter therebetween.

3. The system of claim 1, wherein the seeding container further comprises a vent.

4. The system of claim 3, comprising a closed system, wherein the system further comprises at least one residual seeded cell fluid container, wherein the residual seeded cell fluid container is selectively in fluid communication with the seeding container; and, a vacuum source in fluid communication with the residual seeded cell fluid container.

5. The system of claim 1, wherein the seeding container comprises a threaded body and a threaded cap.

6. The system of claim 1, wherein the seeding container comprises a flexible bag.

7. The system of claim 1, comprising a closed system.

8. The system of claim 1, wherein the seeding container comprises a perforated mandril, and a biocompatible three-dimensional scaffold which is apposed to at least a portion of the mandril.

9. The system of claim 8, wherein the biocompatible three-dimensional scaffold is biodegradable.

10. The system of claim 9, wherein the biocompatible three-dimensional scaffold comprises a matrix of polymer fibers.

11. The system of claim 10, wherein the fibers comprise at least one polymer selected from the group consisting of a poly(lactic acid-glycolic acid), a poly(lactic acid), a poly(glycolic acid), a poly(orthoester), a poly(phosphazene), polycaprolactone, a polyamide, a polyvinyl polymer or co-polymer, a polysaccharide, a collagen, and combinations thereof.

12. The system of claim 11, wherein the fibers comprise poly-l-(lactide acid).

13. The system of claim 1, wherein the system comprises a plurality of seeding containers.

14. The system of claim 13, wherein the plurality of seeding containers is selectively in fluid communication with a manifold, which is selectively in fluid communication with the flow channel, and comprises an inlet, a valve, and a plurality of outlets, and wherein the manifold is adapted to distribute fluid and/or gas substantially equally to each seeding container.

15. The system of claim 8, wherein scaffold is a tissue graft capable of facilitating three dimensional tissue growth on the graft.

16. The system of claim 15, wherein tissue graft is an implantable vascular tissue graft.

17. The system of claim 16, wherein vascular tissue graft surrounds at least a portion of the mandril.

18. The system of claim 1, comprising a closed system, wherein the cellular isolate fluid is sterile.

19. The system of claim 1, comprising a closed system, wherein the elution solution is sterile.

20. The system of claim 4, wherein each of the cellular isolate fluid container, elution fluid container, collection fluid container, seeding container, and residual cell fluid container comprises an inlet and an outlet.

21. A method for seeding cells onto a scaffold comprising:

providing the system of claim 4, wherein at least one valve is disposed between the flow channel and each of the cellular isolate fluid container, collection fluid container, elution fluid container, and the seeding container, respectively, and wherein a first phase is defined by the flow channel being in fluid communication only with the cellular isolate fluid container and the collection fluid container;

directing flow of fluid in a first direction from the cellular isolate fluid container to the collection fluid container, wherein the cells from the cellular isolate fluid are retained on the filter;

closing at least one valve such that the flow channel is not in fluid communication with the collection fluid container or the cellular isolate fluid container, wherein a second phase is defined by the flow channel being in fluid communication only with the elution fluid container and the seeding container;

directing flow of the elution solution from the elution fluid container through the flow channel filter in a direction approximately opposite from the first direction, such that the cells are substantially removed from the filter and flow into the seeding container; and

removing the fluid from the seeding container by directing flow through the biocompatible three-dimensional scaffold and the perforated mandril into the residual cell fluid container, whereby at least a portion of the cells in the seeding container are seeded onto the scaffold.

22. The method of claim 21, wherein the method includes, prior to removing the fluid in the seeding container:

closing a valve between the flow channel and the elution fluid container, wherein a third phase is defined by the collection fluid container being in fluid communication only with the flow channel and/or the seeding container; and

directing flow of fluid from the collection fluid container to the seeding container.

23. The method of claim 22, wherein the flow of fluid in at least one of the first phase, second phase, or third phase is due to gravity.

24. The method of claim 21, wherein the fluid is removed from the seeding container by a vacuum.

25. The method of claim 21, wherein a housing comprises the flow channel, inlet, outlet, and filter therebetween.

26. A closed system for culturing cells, comprising:

a first means for containing a cellular isolate;

a second means for directing fluid flow, wherein the second means comprises a filter, and the filter is adapted to allow flow in at least two directions,

a third means for collecting fluid, wherein the second means is disposed between the first means and the third means,

a fourth means for containing an elution fluid, and

a fifth means for containing a cell seeding assembly,

wherein the second means is selectively in fluid communication with each of the first means, third means, fourth means, and fifth means, respectively,

a sixth means for directing fluid flow,

a biocompatible three-dimensional scaffold apposed to at least a portion of the sixth means;

a seventh means for containing residual seeded cell fluid which is in fluid communication with the fifth means; wherein the sixth means is disposed between the fifth and seventh means,

and

an eighth means for removing residual seeded cell fluid which is in fluid communication with the seventh means, and wherein each of the first means, second means, third means, fourth means, fifth means, sixth means, seventh means, and eighth means are connected by a ninth means for facilitating fluid flow.

27. The closed system of claim 26, wherein at least one of the first means, third means, fourth means, fifth means, seventh means, eighth means or combination thereof is a flexible or rigid plastic container.

28. The closed system of claim 26, wherein the ninth means comprises a flexible or rigid fluid line, and at least one valve that permits the selective flow of a medium therethrough.

29. The closed system of claim 26, wherein the sixth means is a perforated mandril.

30. The closed system of claim 29, wherein the biocompatible three-dimensional scaffold is biodegradable.

31. The closed system of claim 28, wherein the biocompatible three-dimensional scaffold comprises a matrix of polymer fibers.

32. The closed system of claim 29, wherein the fibers comprise at least one polymer selected from the group consisting of a poly(lactic acid-glycolic acid), a poly(lactic acid), a poly(glycolic acid), a poly(orthoester), a poly(phosphazene), polycaprolactone, a polyamide, a polyvinyl polymer or co-polymer, a polysaccharide, a collagen, and combinations thereof.

33. The closed system of claim 32, wherein the fibers comprise poly-l-(lactide acid).

CLAIMS

1. A method for seeding cells onto a scaffold comprising:

providing a closed system for seeding cells comprising:

a cellular isolate fluid container;

a flow channel disposed between the cellular isolate fluid container, a collection fluid container, an elution fluid container, and a seeding container, the seeding container comprising a vent and a cell seeding assembly and the flow channel comprising an inlet, an outlet, and a filter therebetween;

at least one residual seeded cell fluid container; and

a vacuum source in fluid communication with the residual seeded cell fluid container; wherein

the filter is adapted to allow flow in at least two directions;

the flow channel is selectively in fluid communication with each of the cellular isolate fluid container, the collection fluid container, the elution fluid container, and the seeding container, respectively;

the residual seeded cell fluid container is selectively in fluid communication with the seeding container;

at least one valve is disposed between the flow channel and each of the cellular isolate fluid container, collection fluid container, elution fluid container, and the seeding container, respectively; and

a first phase is defined by the flow channel being in fluid communication only with the cellular isolate fluid container and the collection fluid container;

directing flow of fluid in a first direction from the cellular isolate fluid container to the collection fluid container, wherein the cells from the cellular isolate fluid are retained on the filter;

closing at least one valve such that the flow channel is not in fluid communication with the collection fluid container or the cellular isolate fluid container, wherein a second phase is defined by the flow channel being in fluid communication only with the elution fluid container and the seeding container;

directing flow of the elution solution from the elution fluid container through the flow channel filter in a direction approximately opposite from the first direction, such that the cells are substantially removed from the filter and flow into the seeding container; and

removing the fluid from the seeding container by directing flow through the biocompatible three-dimensional scaffold and a perforated mandril into the residual cell fluid container, whereby at least a portion of the cells in the seeding container are seeded onto the scaffold.

2. The method of claim 1, wherein the method includes, prior to removing the fluid in the seeding container:

closing a valve between the flow channel and the elution fluid container, wherein a third phase is defined by the collection fluid container being in fluid communication only with the flow channel and/or the seeding container; and

directing flow of fluid from the collection fluid container to the seeding container.

3. The method of claim 2, wherein the flow of fluid in at least one of the first phase, second phase, or third phase is due to gravity.

4. The method of claim 1, wherein the fluid is removed from the seeding container by a vacuum.

5. The method of claim 1, wherein a housing comprises the flow channel, inlet, outlet, and filter therebetween.

6. A closed system for culturing cells, comprising:

a first means for containing a cellular isolate;

a second means for directing fluid flow, wherein the second means comprises a filter, and the filter is adapted to allow flow in at least two directions,

a third means for collecting fluid, wherein the second means is disposed between the first means and the third means,

a fourth means for containing an elution fluid, and

a fifth means for containing a cell seeding assembly, wherein the second means is selectively in fluid communication with each of the first means, third means, fourth means, and fifth means, respectively,

a sixth means for directing fluid flow,

a biocompatible three-dimensional scaffold apposed to at least a portion of the sixth means;

a seventh means for containing residual seeded cell fluid which is in fluid communication with the fifth means; wherein the sixth means is disposed between the fifth

and seventh means,

and

an eighth means for removing residual seeded cell fluid which is in fluid communication with the seventh means, and wherein each of the first means, second means, third means, fourth means, fifth means, sixth means, seventh means, and eighth means are connected by a ninth means for facilitating fluid flow.

7. The closed system of claim 6, wherein at least one of the first means, third means, fourth means, fifth means, seventh means, eighth means or combination thereof is a flexible or rigid plastic container.

8. The closed system of claim 6, wherein the ninth means comprises a flexible or rigid fluid line, and at least one valve that permits the selective flow of a medium therethrough.

9. The closed system of claim 6, wherein the sixth means is a perforated mandril.

10. The closed system of claim 9, wherein the biocompatible three-dimensional scaffold is biodegradable.

11. The closed system of claim 8, wherein the biocompatible three-dimensional scaffold comprises a matrix of polymer fibers.

12. The closed system of claim 11, wherein the fibers comprise at least one polymer selected from the group consisting of a poly(lactic acid-glycolic acid), a poly(lactic acid), a poly(glycolic acid), a poly(orthoester), a poly(phosphazene), polycaprolactone, a polyamide, a polyvinyl polymer or co-polymer, a polysaccharide, a collagen, and combinations thereof.

13. The closed system of claim 12, wherein the fibers comprise poly-l-(lactide acid).

14. The method of claim 1, wherein the seeding container comprises a threaded body and a threaded cap.

15. The method of claim 1, wherein the seeding container comprises a flexible bag.

16. The method of claim 1, wherein the seeding container comprises the perforated mandril, and the biocompatible three-dimensional scaffold which is apposed to at least a portion of the mandril.

17. The method of claim 16, wherein the biocompatible three-dimensional scaffold is biodegradable.

18. The method of claim 17, wherein the biocompatible three-dimensional scaffold comprises a matrix of polymer fibers.

19. The method of claim 18, wherein the fibers comprise at least one polymer selected from the group consisting of a poly(lactic acid-glycolic acid), a poly(lactic acid), a poly(glycolic acid), a poly(orthoester), a poly(phosphazene), polycaprolactone, a polyamide, a polyvinyl polymer or co-polymer, a polysaccharide, a collagen, and combinations thereof.

20. The method of claim 19, wherein the fibers comprise poly-l-(lactide acid).

21. The method of claim 1, wherein the system comprises a plurality of seeding containers.

22. The method of claim 21, wherein the plurality of seeding containers is selectively in fluid communication with a manifold, which is selectively in fluid communication with the flow channel, and comprises an inlet, a valve, and a plurality of outlets, and wherein the manifold is adapted to distribute fluid and/or gas equally to each seeding container.

23. The method of claim 17, wherein the scaffold is a tissue graft capable of facilitating three dimensional tissue growth on the graft.

24. The method of claim 23, wherein the tissue graft is an implantable vascular tissue graft.

25. The method of claim 24, wherein the vascular tissue graft surrounds at least a portion of the mandril.

26. The method of claim 1, wherein the cellular isolate fluid is sterile.

27. The method of claim 1, wherein the elution solution is sterile.

28. The method of claim 1, wherein each of the cellular isolate fluid container, elution fluid container, collection fluid container, seeding container, and residual cell fluid container comprises an inlet and an outlet.