## CLAIMS

1. A device for implanting cells in a host body, comprising:

a porous scaffold comprising an immunologically-compatible polymer mesh forming the walls of at least one chamber,

wherein the chamber comprises an opening at either or both of a proximal end and a distal end of the chamber, wherein the proximal end and the distal end are separated by a lumen that is bounded by the walls, and wherein the porous scaffold has pores sized to facilitate growth of vascular and connective tissues around and through the walls of the at least one chamber;

at least one removable, non-porous plug configured to be positioned within the lumen of the at least one chamber,

wherein the plug extends along the lumen of the chamber; and

at least one seal configured to enclose either or both the proximal end and the distal end of the chamber.

2. The device of claim 1, wherein the device comprises cells within the chamber.

3. The device of claim 2, wherein the cells comprise islets of Langerhans.

4. The device of claim 2, wherein the cells comprise islets of Langerhans and Sertoli cells.

5. The device of claim 2, wherein the cells comprise stem cells.

6. The device of claim 2, wherein the cells comprise one or more of stem cells, differentiated stem cells, neural stem cells, dopaminergic neurons, cord blood cells, embryonic stem cells, and/or mesenchymal stem cells.

7. The device of claim 2, wherein the cells comprise allogeneic, xenogenic, or syngeneic donor cells, or patient-derived cells.

8. The device of claim 2, wherein the cells comprise genetically engineered cells or cell lines.

9. The device of claim 1, wherein the porous scaffold comprises multiple chambers that are connected laterally.

10. The device of claim 1, wherein the at least one seal is a polymer film that is ultrasonically welded to the porous scaffold.

11. The device of claim 1, further comprising a material coating at least a part of the porous scaffold, wherein the material stimulates tissue incorporation and angiogenesis.

12. The device of claim 11, wherein the material comprises one or more of a growth factor, an antifibrotic agent, a polymer, vascular endothelial growth factor (VEGF), collagen, fibronectin, polyethylene-imine and dextran sulfate, polyvinyl siloxane and polyethyleneimine, phosphorylcholine, poly(ethylene glycol), poly(lactic-co-glycolic acid), poly(lactic acid), polyhydroxyvalerate and copolymers, polyhydroxybutyrate and copolymers, polydiaxanone, polyanhydrides, poly(amino acids), poly(orthoesters), gelatin, a cellulose polymer, a chitosan, an alginate, vinculin, agar, agarose, hyaluronic acid, and matrigel.

13. The device of claim 1, wherein the porous scaffold is configured to facilitate growth of vascular and connective tissues into the porous chamber to encapsulate the plug in a neovascularized collagen matrix, and wherein the plug is capable of being withdrawn from the chamber to create a space within the chamber that is encapsulated in the neovascularized collagen matrix.

14. The device of claim 1, further comprising a cell delivery device comprising at least one cell infusion tube configured to be positioned within the chamber and configured to deliver cells to the chamber of the device.

15. The device of claim 1, wherein the porous scaffold comprises one chamber, two chambers, three chambers, four chambers, five chambers, six chambers, seven chambers, eight chambers, ten chambers, twelve chambers, or more chambers.

16. The device of claim 2, wherein the cells comprise differentiated stem cells or encapsulated cells.

17. The device of claim 16, wherein the cells are encapsulated in alginate, a polysaccharide hydrogel, chitosan, calcium or barium alginate, a layered matrix of alginate and polylysine, photopolymerizable poly(ethylene glycol) polymer, a polyacrylate, hydroxyethyl methacrylate, methyl methacrylate, a silicon capsule, a silicon nanocapsule, a polymembrane, or acrylonitrile-co-vinyl chloride.

18. The device of claim 1, further comprising a material coating at least a part of the porous scaffold, wherein the material comprises a biocompatible, biodegradable material, a non-biodegradable material, or combination thereof.

19. The device of claim 1, wherein the polymer mesh comprises a polytetrafluoroethylene mesh, a polyurethane mesh, a polyester mesh, and/or a silk mesh.

20. The device of claim 1, wherein the polymer mesh comprises a polypropylene mesh.

21. The device of claim 2, wherein the cells comprise two or more cell types selected from islets of Langerhans, Sertoli cells, stem cells, differentiated stem cells, neural stem cells, dopaminergic neurons, cord blood cells, embryonic stem cells, allogeneic cells, xenogeneic or syngeneic cells, genetically engineered cells or cell lines, and mesenchymal stem cells.

22. The device of claim 11, wherein the material comprises a biocompatible, biodegradable material, a non-biodegradable material, or a combination thereof.