opposing second interior surface, wherein the first interior surface is spaced apart in the chamber from the second interior surface; structural spacers disposed within the chamber to maintain an average distance between the first interior surface and the second interior surface along a length and/or width of the chamber and to interconnect said first interior surface and said second interior surface, wherein the structural spacers further define at least one reservoir space for the placement of cells within the chamber, wherein both of the first and second layers are composite layers comprising: a) an outer porous layer; and b) an inner porous layer adjacent to the outer porous layer, wherein the inner porous layer has a porosity that is less than the outer porous layer, and wherein a portion of the inner porous layer is the first or second interior surface, wherein the structural spacers are adhered to at least one of the inner porous layers of the first and second composite layers via an adhesive and the adhesive does not penetrate into the pores of the outer porous layers of the first and second composite layers.

[0007b] In another aspect, the present invention refers to a cell encapsulation device comprising: a first layer sealed along a portion of its periphery to a second layer along a portion of its periphery to define a chamber comprising a first interior surface and an opposing second interior surface, wherein the first interior surface is spaced apart in the chamber from the second interior surface; and structural spacers disposed within the chamber to maintain an average distance between the first interior surface and the second interior surface, wherein the structural spacers further define at least one reservoir space for the placement of cells within the chamber, and wherein the structural spacers have a height to base aspect ratio from 2/1 to 10/1; wherein at least one of the first and second layers is a composite layer comprising:

a) an outer porous layer; and

b) an inner porous layer adjacent to the outer porous layer, wherein the inner porous layer has a porosity that is less than the outer porous layer, and wherein a portion of the inner porous layer is the first or second interior surface;

wherein both of the first and second layers are composite layers;

wherein the structural spacers are adhered to the inner porous layers of the first and second composite layers; and

wherein the structural spacers are adhered by an adhesive and the adhesive does not penetrate into the pores of the outer porous layers of the first and second composite layers.

[0008] In some examples, a cell encapsulation device described herein includes a port that extends through the sealed periphery of the first layer and the

WHAT IS CLAIMED IS

1. A cell encapsulation device comprising:

a first layer sealed along a portion of its periphery to a second layer along a portion of its periphery to define a chamber comprising a first interior surface and an opposing second interior surface, wherein the first interior surface is spaced apart in the chamber from the second interior surface;

structural spacers disposed within the chamber to maintain an average distance between the first interior surface and the second interior surface along a length and/or width of the chamber and to interconnect said first interior surface and said second interior surface,

wherein the structural spacers further define at least one reservoir space for the placement of cells within the chamber,

wherein both of the first and second layers are composite layers comprising:

a) an outer porous layer; and

b) an inner porous layer adjacent to the outer porous layer, wherein the inner porous layer has a porosity that is less than the outer porous layer, and wherein a portion of the inner porous layer is the first or second interior surface,

wherein the structural spacers are adhered to at least one of the inner porous layers of the first and second composite layers via an adhesive and the adhesive does not penetrate into the pores of the outer porous layers of the first and second composite layers.

2. The cell encapsulation device of claim 1, further comprising at least one port in fluid communication with the reservoir space.

3. The cell encapsulation device of claim 1, further comprising a plurality of cells in said at least one reservoir space.

4. The cell encapsulation device of claim 1, wherein the first and second layers are impervious to vascular ingrowth.

5. The cell encapsulation device of claim 1, wherein the outer porous layer is sufficiently porous to permit growth of vascular tissue from a patient within the pores of the outer porous layer up to, but not through, the inner porous layer.

6. The cell encapsulation device of claim 1, wherein at least one of the first and second layers comprises a bio-absorbable material.

7. The cell encapsulation device of claim 1, wherein said structural spacers comprise an oxygen permeable material.

8. The cell encapsulation device of claim 1, wherein a porosity of said first outer porous layer and said second outer porous layer is maintained.

9. The cell encapsulation device of claim 7, wherein the bio-absorbable material is in the form of a powder or a screen.

10. The cell encapsulation device of claim 1, wherein the inner porous layer is impervious to cellular ingrowth.

11. The cell encapsulation device of claim 1, wherein said encapsulation device has a substantially tubular configuration.

12. The cell encapsulation device of claim 1, wherein the structural spacers maintain the average distance under an applied force.

13. The cell encapsulation device of claim 1, wherein the structural spacers comprise a porous material.

14. The cell encapsulation device of claim 1, wherein the structural spacers comprise a shape memory material.

15. The cell encapsulation device of claim 1, wherein the structural spacers comprise a non-porous material.

16. The cell encapsulation device of claim 1, wherein the average distance between the first and second interior surfaces is at least about 50 microns.

17. The cell encapsulation device of claim 1, wherein the device comprises a plurality of reservoir spaces that are interconnected.

18. The cell encapsulation device of claim 1, wherein the device comprises at least two reservoir spaces that are discrete.

19. The cell encapsulation device of claim 1, wherein at least one of said inner porous layer and said outer porous layer comprises expanded polytetrafluoroethylene.

20. The cell encapsulation device of claim 1, wherein the structural spacers comprise a plurality of fibers.

21. The cell encapsulation device of claim 1, wherein the structural spacers comprise a 3D printed bead of a thermoplastic polymer.

22. The cell encapsulation device of claim 1, wherein the structural spacers comprise a three dimensional woven fabric comprising a structural restraint.

23. A cell encapsulation device comprising:

a first layer sealed along a portion of its periphery to a second layer along a portion of its periphery to define a chamber comprising a first interior surface and an

opposing second interior surface, wherein the first interior surface is spaced apart in the chamber from the second interior surface; and

structural spacers disposed within the chamber to maintain an average distance between the first interior surface and the second interior surface, wherein the structural spacers further define at least one reservoir space for the placement of cells within the chamber, and wherein the structural spacers have a height to base aspect ratio from 2/1 to 10/1;

wherein at least one of the first and second layers is a composite layer comprising:

a) an outer porous layer; and

b) an inner porous layer adjacent to the outer porous layer, wherein the inner porous layer has a porosity that is less than the outer porous layer, and wherein a portion of the inner porous layer is the first or second interior surface;

wherein both of the first and second layers are composite layers;

wherein the structural spacers are adhered to the inner porous layers of the first and second composite layers; and

wherein the structural spacers are adhered by an adhesive and the adhesive does not penetrate into the pores of the outer porous layers of the first and second composite layers.