THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A system for releasing therapeutic agents, the system comprising:

an implantable encapsulation device comprising a channel operable to deliver fluid to an interior of the encapsulation device, a lumen at least partially encapsulating the channel and comprising a vascularized chamber, and a vascularization membrane at least partially encapsulating the lumen;

at least one of an insulin infusion pump and a syringe operatively connected to and in fluid communication with the encapsulation device and wherein the at least one of an insulin infusion pump and a syringe is operable to deliver insulin to the vascularized chamber.

2. The system of claim 1, wherein the lumen of the encapsulation device comprises insulin-secreting cells.

3. The system of claim 1, wherein the system is in communication with a remote system that is operable to receive signals from the system.

4. The system of claim 3, wherein the system comprises an insulin infusion pump and a remote system is operatively connected to the insulin infusion pump to allow remote regulation of the insulin infusion pump.

5. The system of claim 1, further comprising a glucose sensor operatively connected to an insulin infusion pump via a controller and wherein the controller is operable to receive signals from the glucose sensor and send signals to the insulin infusion pump to release insulin.

6. The system of claim 1, further comprising at least one of a glucose sensor and an oxygen sensor.

7. The system of claim 6, further comprising a reader operable to receive signals from the sensor.

8. A system for monitoring and regulating blood glucose, the system comprising:

an implantable subcutaneous encapsulation device comprising a channel operable to deliver fluid to an interior of the encapsulation device, a lumen at least partially encapsulating the channel, and a vascularization membrane at least partially encapsulating the lumen;

at least one glucose sensor provided within the encapsulation device; and

a glucose sensor reader in communication with the at least one glucose sensor, wherein the glucose sensor reader is in communication with at least one remote device.

9. The system of claim 8, further comprising an insulin pump in fluid communication with the encapsulation device.

10. The system of claim 9, wherein the remote device is operatively connected to the insulin pump to allow remote regulation of the insulin pump.

11. The system of claim 9, wherein the at least one glucose sensor is operatively connected to the insulin pump via a controller and wherein the controller is operable to receive signals from the glucose sensor and send signals to the insulin pump to release insulin.

12. The system of claim 8, wherein the glucose sensor comprises at least one of an optical and an electrochemical sensor.

13. The system of claim 8, wherein the remote device comprises a wireless device.

14. A system for monitoring and regulating blood glucose, the system comprising:

an implantable subcutaneous encapsulation device comprising a lumen that is operable to receive cells, and a vascularization membrane at least partially encapsulating the lumen;

at least one glucose sensor provided within the encapsulation device;

a glucose sensor reader in communication with the at least one glucose sensor; and

wherein the encapsulation device further comprises a channel that is operable to convey at least one of oxygen and air to the encapsulation device.

15. The system of claim 14, further comprising an insulin infusion pump operatively connected to the at least one glucose sensor.

16. The system of claim 14, wherein the at least one glucose sensor is provided within the lumen of the encapsulation device.

17. The system of claim 14, wherein the device is in communication with a remote system that is operable to receive signals from the at least one glucose sensor.

18. The system of claim 15, wherein the remote system is operatively connected to the insulin infusion pump to allow remote regulation of the insulin infusion pump.

19. The system of claim 15, wherein the at least one glucose sensor is operatively connected to the insulin infusion pump via a controller and wherein the controller is operable to receive signals from the glucose sensor and send signals to the insulin infusion pump to release insulin.

20. The system of claim 14, wherein the glucose sensor comprises at least one of an optical and an electrochemical sensor.