WHAT IS CLAIMED IS:

1. A biomedical device comprising:

an electroactive component;

a biocompatible battery, wherein the biocompatible battery comprises:

a first and second current collector;

a cathode;

an anode; and

a laminar structure, wherein at least a layer of the laminar structure has a volume removed to form a cavity, wherein the cavity contains an electrolyte solution, a separator, and the cathode; and

wherein the biocompatibility of the biomedical device is improved by formulating a composition of the electrolyte solution to approximate a composition of biofluids in contact with the biomedical device.

2. The biomedical device of claim 1 wherein the composition of the electrolyte solution approximates a composition of tear fluid.

3. The biomedical device of claim 1 wherein a thickness of the biocompatible battery is less than 1 mm at least along a first dimension of an extent of the biocompatible battery.

4. The biomedical device of claim 1 wherein a thickness of the biocompatible battery is less than 500 microns at least along a first dimension of an extent of the biocompatible battery.

5. The biomedical device of claim 1 wherein a thickness of the biocompatible battery is less than 250 microns at least along a first dimension of an extent of the biocompatible battery.

6. A biomedical device comprising:

an electroactive component;

a biocompatible battery, wherein the biocompatible battery comprises:

a first and second current collector;

a cathode;

an anode; and

a laminar structure, wherein at least a layer of the laminar structure has a volume removed to form a cavity, wherein the cavity contains an electrolyte solution, a separator, and the cathode; and

wherein the biocompatibility of the biocompatible battery is improved by formulating a composition of the electrolyte solution to comprise a zinc salt at less than or approximately equal to 10 percent by weight.

7. The biomedical device of claim 6, wherein the biocompatible battery further comprises:

a sealed encapsulation of the laminar structure, wherein the sealed encapsulation improves the biocompatibility of the biomedical device by decreasing an effusion of the electrolyte to an external environment.

8. The biomedical device of claim 6, wherein the biocompatible battery further comprises:

a sealed encapsulation of the laminar structure, wherein the sealed encapsulation improves the biocompatibility of the biocompatible battery by decreasing an effusion of water into an internal environment of the biocompatible battery.

9. The biomedical device of claim 6 further comprising:

an encapsulating layer of hydrogel.

10. The biomedical device of claim 9 wherein the encapsulating layer comprises the hydrogel which comprises zwitterions.

11. A method of improving biocompatibility in a battery comprising:

preparing an electrolyte solution; wherein the electrolyte solution comprises a zinc salt at a concentration less than or approximately equal to 10 percent by weight;

obtaining a layer of a laminar structure;

cutting out a volume from the layer of the laminar structure, wherein removing the volume from the layer of the laminar structure forms at least a portion of a cavity; and

adding the electrolyte solution, a separator, an anode, an anode current collector, a cathode, and a cathode current collector, to form a biocompatible battery.

12. The method of claim 11 further comprising forming a seal of an envelope layer to the laminar structure.

13. The method of claim 11 further comprising forming a seal of a first envelope layer to a second envelope layer.

14. The method of claim 13 wherein a total thickness of the biocompatible battery is less than 500 microns.

15. A method of improving biocompatibility in a contact lens comprising:
preparing an electrolyte solution; wherein the electrolyte solution comprises contact lens packaging solution;
obtaining a layer of a laminar structure;
cutting out a volume from the layer of the laminar structure, wherein removing the volume from the layer of the laminar structure forms at least a first portion of a cavity;
adding the electrolyte solution, a separator, an anode, an anode current collector, a cathode, and a cathode current collector, to form the laminar structure;
forming a seal of a first envelope layer to a second envelope layer, wherein the first envelope layer and the second envelope layer surround at least a second portion of the laminar structure;
connecting the anode current collector to an electroactive device;
connecting the cathode current collector to the electroactive device; and
encapsulating the laminar structure and electroactive device in a hydrogel to form an ophthalmic device.

16. The method of claim 15 wherein a total thickness of the laminar structure is less than 500 microns.

17. The method of claim 15 wherein the hydrogel incorporates zwitterions.

18. A method of improving biocompatibility in a contact lens comprising:

preparing an electrolyte solution;

obtaining a layer of a laminar structure;

cutting out a volume from the layer of the laminar structure, wherein removing the volume from the layer of the laminar structure forms at least a first portion of a cavity;

adding the electrolyte solution, a separator, an anode, an anode current collector, a cathode, and a cathode current collector, to form the laminar structure;

forming a seal of a first envelope layer to a second envelope layer, wherein the first envelope layer and the second envelope layer surround at least a second portion of the laminar structure;

connecting the anode current collector to an electroactive device;

connecting the cathode current collector to the electroactive device; and

encapsulating the laminar structure and electroactive device in a hydrogel to form an ophthalmic device.

19. The method of claim 18 wherein a total thickness of the laminar structure is less than 500 microns.

20. The method of claim 19 wherein the hydrogel incorporates zwitterions.

CLAIMS

1. A biomedical device comprising:
an electroactive component;
a biocompatible battery, wherein the biocompatible battery comprises:
a first and second current collector;
a cathode;
an anode; and
a laminar structure, wherein at least a layer of the laminar structure has a volume removed to form a cavity, wherein the cavity contains an electrolyte solution, a separator, and the cathode; and
wherein the biocompatibility of the biomedical device is improved by formulating a composition of the electrolyte solution to approximate a composition of biofluids in contact with the biomedical device and
wherein the composition of the electrolyte solution approximates a composition of tear fluid.

2. The biomedical device of claim 1 wherein a thickness of the biocompatible battery is less than 1 mm at least along a first dimension of an extent of the biocompatible battery.

3. The biomedical device of claim 1 wherein a thickness of the biocompatible battery is less than 500 microns at least along a first dimension of an extent of the biocompatible battery.

4. The biomedical device of claim 1 wherein a thickness of the biocompatible battery is less than 250 microns at least along a first dimension of an extent of the biocompatible battery.

5. A biomedical device comprising:
an electroactive component;
a biocompatible battery, wherein the biocompatible battery comprises:
a first and second current collector;
a cathode;

an anode; and

a laminar structure, wherein at least a layer of the laminar structure has a volume removed to form a cavity, wherein the cavity contains an electrolyte solution, a separator, and the cathode; and

wherein the biocompatibility of the biocompatible battery is improved by formulating a composition of the electrolyte solution to comprise a zinc salt at less than or approximately equal to 10 percent by weight.

6. The biomedical device of claim 5, wherein the biocompatible battery further comprises:

a sealed encapsulation of the laminar structure, wherein the sealed encapsulation improves the biocompatibility of the biomedical device by decreasing an effusion of the electrolyte to an external environment.

7. The biomedical device of claim 5, wherein the biocompatible battery further comprises:

a sealed encapsulation of the laminar structure, wherein the sealed encapsulation improves the biocompatibility of the biocompatible battery by decreasing an effusion of water into an internal environment of the biocompatible battery.

8. The biomedical device of claim 5 further comprising:

an encapsulating layer of hydrogel.

9. The biomedical device of claim 8 wherein the encapsulating layer comprises the hydrogel which comprises zwitterions.

10. A method of improving biocompatibility in a battery comprising:

preparing an electrolyte solution; wherein the electrolyte solution comprises a zinc salt at a concentration less than or approximately equal to 10 percent by weight;

obtaining a layer of a laminar structure;

cutting out a volume from the layer of the laminar structure, wherein removing the volume from the layer of the laminar structure forms at least a portion of a cavity; and

adding the electrolyte solution, a separator, an anode, an anode current collector, a cathode, and a cathode current collector, to form a biocompatible battery.

11. The method of claim 10 further comprising forming a seal of an envelope layer to the laminar structure.

12. The method of claim 10 further comprising forming a seal of a first envelope layer to a second envelope layer.

13. The method of claim 12 wherein a total thickness of the biocompatible battery is less than 500 microns.

14. A method of improving biocompatibility in a contact lens comprising:
preparing an electrolyte solution; wherein the electrolyte solution comprises contact lens packaging solution;
obtaining a layer of a laminar structure;
cutting out a volume from the layer of the laminar structure, wherein removing the volume from the layer of the laminar structure forms at least a first portion of a cavity;
adding the electrolyte solution, a separator, an anode, an anode current collector, a cathode, and a cathode current collector, to form the laminar structure;
forming a seal of a first envelope layer to a second envelope layer, wherein the first envelope layer and the second envelope layer surround at least a second portion of the laminar structure;
connecting the anode current collector to an electroactive device;
connecting the cathode current collector to the electroactive device; and
encapsulating the laminar structure and electroactive device in a hydrogel to form an ophthalmic device.

15. The method of claim 14 wherein a total thickness of the laminar structure is less than 500 microns.

16. The method of claim 14 wherein the hydrogel incorporates zwitterions.

17. A method of improving biocompatibility in a contact lens comprising:
preparing an electrolyte solution;
obtaining a layer of a laminar structure;
cutting out a volume from the layer of the laminar structure, wherein removing the volume from the layer of the laminar structure forms at least a first portion of a cavity;
adding the electrolyte solution, a separator, an anode, an anode current collector, a cathode, and a cathode current collector, to form the laminar structure;
forming a seal of a first envelope layer to a second envelope layer, wherein the first envelope layer and the second envelope layer surround at least a second portion of the laminar structure;
connecting the anode current collector to an electroactive device;
connecting the cathode current collector to the electroactive device; and
encapsulating the laminar structure and electroactive device in a hydrogel to form an ophthalmic device.

18. The method of claim 17 wherein a total thickness of the laminar structure is less than 500 microns.

19. The method of claim 18 wherein the hydrogel incorporates zwitterions.