CLAIMS

1. A composition comprising one or more living cells coated with hydrogel, wherein the hydrogel comprises a covalently cross-linked network of first functionalized multi arm polymers and second functionalized multi arm polymers that cross link with each other through reaction between click chemistry reaction pairs.
2. The composition of claim 1, wherein the multi arm polymer is 4-arm 5-10kDa PEG; methacryloyloxyethyl phosphocholine co-polymer that is 100-200 kDa and 60-90% phosphocholine, or a combination thereof.
3. The composition of claim 1 or 2, wherein the click chemistry reaction pair is azide and DBCO.
4. A method of conformal coating a biological surface in a hydrogel comprising:

   providing a system comprising two aqueous layers, the first layer comprising a solution of 0.25% to 2% (W/V) of a suspending agent, 1% to 25% (W/V) of a first functionalized multi arm polymer, and the biological surface;

   a second layer comprising a saccharide cushion and 1% to 25% (W/V) of a second functionalized multi arm polymer, the functional group of the second functionalized multi arm polymer being reactive with the functional group of the first functionalized multi arm polymer under physiological conditions,

   causing the biological surface to pass into the second layer, thereby allowing the first and second functional groups to react and form a cross-linked hydrogel conformally coating the biological surface.
5. The method of claim 4, wherein the first functionalized multi arm polymer is 4-arm 5-10kDa PEG.
6. The method of claim 4, wherein the first functionalized multi arm polymer is methacryloyloxyethyl phosphocholine co-polymer that is 100-200 kDa and 60-90% phosphocholine.
7. The method of any one of claims 4-6, wherein the functional group of the first functionalized multi arm polymer is a click functional group.
8. The method of claim 7, wherein the click functional group is DBCO or azide.
9. The method of any one of claims 4-8, wherein the second functionalized multi arm polymer is 4-arm 5-10 kDa PEG.

10. The method of any one of claims 4-8, wherein the second functionalized multi arm polymer is a methacryloyloxyethyl phosphocholine co-polymer that is 100-200 kDa and 60-90% phosphocholine.
11. The method of any one of claims 4-10, wherein the functional group of the second functionalized multi arm polymer is a click functional group.
12. The method of claim 11, wherein the click functional group is azide or DBCO.
13 The method of any one of claims 4-12, wherein either one of the first functionalized multi arm polymer or the second functionalized multi arm polymer includes an azide group, and the other includes a DBCO group.
14. The method of any one of claims 4-13, wherein the second layer comprises a second suspending agent, wherein the second suspending agent is the same as the suspending agent in the first layer.
15. The method of any one of claims 4-14, wherein the system comprises an intervening layer between the first and second layers, optionally wherein the intervening layer is a gaseous layer.
16. The method of any one of claims 4-15, wherein suspending agent is PEO with a molecular weight of between 1-8 MDa that is present at 1%.
17. The method of claim 15, wherein the second layer further comprises a solution of 0.25% to 2% (W/V) of the suspending agent; and wherein the first functionalized multi arm polymer is a methacryloyloxyethyl phosphocholine co-polymer.
18. The method of claim 17, wherein the first layer is continuously added to the second layer, optionally wherein the second layer is within a container suitable for the addition of the first layer through a tapered side arm with an orifice dimensioned to allow the mixture to travel under centrifugal force.
19. The method of any one of claims 4-18, wherein the biological surface is caused to pass into the second layer by centrifugation.
20. The method of any one of claims 4-19, wherein the thickness of the conformal coating is less than 20 μm.
21. The method of any one of claims 4-20, wherein the biological surface comprises one or more living cells.
22. The composition of any one of claims 1-3 or the method of claim 21, wherein the one or more living cells are insulin-producing cells.

23. The composition of any one of claims 1-3 or the method of claim 21, wherein the one or more living cells are pluripotent stem cells.

24. The composition or method of claim 22, wherein upon stimulation with glucose at 2 mM to 20 mM, relative to one or more suitable control cells not subjected to the conformal coating, the one or more cells secrete insulin with kinetics and/or at a concentration that is substantially similar to the one or more suitable control cells.

25. A biological surface having a conformal coating, prepared by the method of any one of claims 4-24.

26. The composition of any one of claims 1-3, or 22-24 further comprising a pharmaceutically acceptable diluent or excipient, optionally wherein the biological surface is contained in a syringe or in a biocompatible container.

27. Composition of any one of claims 1-3 or 22-26 for use in the treatment of a mammalian subject, comprising administering to the subject a therapeutically effective amount of the composition of any one of claims 1-3, or 22-26, optionally wherein the administration may either be by direct injection or by implantation of a biocompatible container.