TITLE

WOUND-TREATING ABSORBENT

PRIORITY CLAIM

[0001] This application claims priority to U.S. Provisional Application No. 62/591,481, filed on November 28, 2017, the entire contents of which are incorporated herein.

BACKGROUND

[0002] Hemostatic agents and sealants are currently used as an aid to stop bleeding, including hemorrhaging, during surgery. The FDA has approved hemostatic matrices, such as FLOSEAL® (Baxter International), for use in patients to augment the natural clotting cascade or to mechanically stop bleeding at a surgical or wound site. FLOSEAL® is a flowable product comprising gelatin and thrombin. The thrombin is first reconstituted with sodium chloride, and then mixed with the gelatin matrix component for use in a syringe.

[0003] Gelatin is derived from animal products such as tendon collagen and skin. Due to concerns about allergies to materials of bovine origin, certain hemostatic compositions that are not of animal origin, such as polyanhydroglucuronic acid, are of interest.

SUMMARY

[0003a] In one aspect of the present disclosure, there is provided a wound-treating absorbent kit comprising:

a set of hemostatic compositions including at least (1) a first hemostatic composition including a first crosslinked polysaccharide comprising dextran, wherein the first hemostatic composition has a first degree of crosslinking, and (2) a second hemostatic composition including a second crosslinked polysaccharide comprising dextran, wherein the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking.

[0003b] In another aspect of the present disclosure, there is provided a use of a hemostatic composition selected from a set of hemostatic compositions comprising at least (1) a first hemostatic composition including a first crosslinked polysaccharide comprising dextran, wherein the first hemostatic composition has a first degree of crosslinking, and (2) a second hemostatic composition including a second crosslinked polysaccharide comprising

dextran, wherein the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking in the manufacture of a medicament for treating a wound.

[0003c] In a further aspect of the present disclosure, there is provided a hemostatic composition selected from a set of hemostatic compositions comprising at least (1) a first hemostatic composition including a first crosslinked polysaccharide comprising dextran, wherein the first hemostatic composition has a first degree of crosslinking, and (2) a second hemostatic composition including a second crosslinked polysaccharide comprising dextran, wherein the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking for use in treating a wound.

[0004] The present disclosure provides a wound-treating absorbent kit comprising a set of hemostatic compositions including at least (1) a first hemostatic composition including a first crosslinked polysaccharide selected from the group consisting of cyclodextrin and dextran, and (2) a second hemostatic composition including a second crosslinked polysaccharide selected from the group consisting of cyclodextrin and dextran. In some embodiments, the first hemostatic composition has a first degree of crosslinking, and the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking.

[0005] Currently, many hemostatic compositions used in patients comprise an animal derived starting material (e.g., gelatin) to manufacture a hemostatic matrix. The present compositions use non-animal polysaccharide/starch polymers to make the hemostatic matrix.

CLAIMS:

The invention is claimed as follows:

Claim 1. A wound-treating absorbent kit comprising:

a set of hemostatic compositions including at least (1) a first hemostatic composition including a first crosslinked polysaccharide comprising dextran, wherein the first hemostatic composition has a first degree of crosslinking, and (2) a second hemostatic composition including a second crosslinked polysaccharide comprising dextran, wherein the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking.

Claim 2. The wound-treating absorbent kit of claim 1, wherein each of the first and second hemostatic compositions is in powdered form.

Claim 3. The wound-treating absorbent kit of claim 2 comprising a pharmaceutically acceptable diluent for reconstitution of any of the first and second hemostatic compositions.

Claim 4. The wound-treating absorbent kit of claim 1, wherein each of the first and second hemostatic compositions comprises a respective crosslinking agent selected from the group consisting of diglycidyl ether, epichlorohydrin, diisocyanate, dicarboxylic acid chlorides, dicarboxylic acid, acid anhydrides, poly(d,l-lactic acid), citric acid, glycerol, dialdehydes, diacyl chlorides, and epoxides.

Claim 5. The wound-treating absorbent kit of claim 4, wherein the first and second hemostatic compositions differ from each other in at least one of an amount and a type of the respective crosslinking agents.

Claim 6. The wound-treating absorbent kit of claim 1, wherein each of the first and second hemostatic compositions has a swelling capability from about 38% to about 1600%.

Claim 7. The wound-treating absorbent kit of claim 1, wherein the second hemostatic composition is configured to absorb less fluid than the first hemostatic composition.

Claim 8. The wound-treating absorbent kit of claim 1 comprising at least one additive selected from the group consisting of water-soluble antimicrobial medicines, enzymes, and growth factor agents.

Claim 9. The wound-treating absorbent kit of claim 1, wherein any of the first and second hemostatic compositions is mixed with at least one agent selected from the group consisting of a blood clotting factor, fibrin, an antiseptic agent, an anti-microbial agent, a vitamin, a micronutrient, an antibiotic agent, and an antifungal agent.

Claim 10. Use of a hemostatic composition selected from a set of hemostatic compositions comprising at least (1) a first hemostatic composition including a first crosslinked polysaccharide comprising dextran, wherein the first hemostatic composition has a first degree of crosslinking, and (2) a second hemostatic composition including a second crosslinked polysaccharide comprising dextran, wherein the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking in the manufacture of a medicament for treating a wound.

Claim 11. The use of claim 10, wherein the hemostatic composition is selected according to a desired swelling capability.

Claim 12. The use of claim 10, wherein each of the first and second hemostatic compositions comprises a respective crosslinking agent selected from the group consisting of diglycidyl ether, epichlorohydrin, diisocyanate, dicarboxylic acid chlorides, dicarboxylic acid, acid anhydrides, poly(d,l-lactic acid), citric acid, glycerol, dialdehydes, diacyl chlorides, and epoxides.

Claim 13. The use of claim 12, wherein the first and second hemostatic compositions differ from each other in at least one of an amount and a type of the respective crosslinking agents.

Claim 14. The use of claim 10, wherein the hemostatic composition is selected according to a reaction parameter selected from the group consisting of a reaction time, a reaction temperature, and a combination thereof.

Claim 15. The use of claim 10, wherein each of the first and second hemostatic compositions has a swelling capability from about 38% to about 1600%.

Claim 16. The use of claim 10, wherein the second hemostatic composition is configured to absorb less fluid than the first hemostatic composition.

Claim 17. The use of claim 10, wherein the selected hemostatic composition is applied in powder form.

Claim 18. The use of claim 10, wherein any of the first and second hemostatic compositions is mixed with at least one agent selected from the group consisting of a blood clotting factor, fibrin, an antiseptic agent, an anti-microbial agent, a vitamin, a micronutrient, an antibiotic agent, an antifungal agent, prior to being administered to the site of the wound.

Claim 19. The use of claim 10, wherein at least one additive selected from the group consisting of water-soluble antimicrobial medicines, enzymes, and growth factor agents is administered with the selected hemostatic composition.

Claim 20. A hemostatic composition selected from a set of hemostatic compositions comprising at least (1) a first hemostatic composition including a first crosslinked polysaccharide comprising dextran, wherein the first hemostatic composition has a first degree of crosslinking, and (2) a second hemostatic composition including a second crosslinked polysaccharide comprising dextran, wherein the second hemostatic composition has a second degree of crosslinking higher than the first degree of crosslinking for use in treating a wound.