# CLAIMS

1. A recombinant collagen fragment having a sequence identity of at least about 85% to the amino acid sequence set forth in SEQ ID NO: 1.

2. The recombinant collagen fragment of claim 1, wherein the collagen fragment has the amino acid sequence set forth in SEQ ID NO: 1.

3. A recombinant collagen fragment having the amino acid sequence set forth in any one of SEQ ID NOs: 2-972.

4. The recombinant collagen fragment of any one of claims 1-3, wherein the fragment is formulated in a pharmaceutically acceptable composition.

5. The recombinant collagen fragment of any one of claims 1-3, wherein the fragment is formulated in a therapeutic biomaterial.

6. The recombinant collagen fragment of claim 5, wherein the therapeutic biomaterial is a protein polyurethane alloy.

7. The recombinant collagen fragment of claim 6, wherein the protein is dissolved in the polyurethane.

8. The recombinant collagen fragment of any one of claims 5-6, wherein the alloy comprises about 10 wt% to about 50 wt% of the fragment and about 50 wt% to about 90 wt% of the polyurethane.

9. The recombinant collagen fragment of any one of claims 5-6, wherein the alloy comprises about 20 wt% to about 35 wt% of the protein and about 65 wt% to about 80 wt% of the polyurethane.

10. The recombinant collagen fragment of any one of claims 5-9, wherein the alloy is free of, or substantially free of, particles of the recombinant collagen fragment having an average diameter of greater than 1 micron.

11. A therapeutic biomaterial comprising a recombinant collagen fragment having a sequence comprising the amino acid sequence set forth in any one of SEQ ID NOs: 974-1002, and a pharmaceutically acceptable scaffold.

12. Use ofa recombinant collagen fragment of claim 1 and a pharmaceutically acceptable scaffold, in the manufacture of a therapeutic biomaterial for the treatment of a cancer in a subject in need thereof.

13. The use of claim 12, wherein the cancer is characterized by the presence of a solid tumor.

14. The use of claim 12 or 13, wherein the cancer is a cancer of the skin, colon, oral mucosa, rectum, esophagus, thyroid, liver, pancreas, kidney, bladder, lung, brain, breast, ovary, testicle, prostate, bones, or a combination of any of the foregoing.

15. The biomaterial or the use of any one of claims 12-14, wherein the biomaterial is a protein polyurethane alloy.

16. The biomaterial or the use of claim 15, wherein the protein is dissolved in the polyurethane.

17. The biomaterial or the use of any one of claims 11-14, wherein the pharmaceutically acceptable scaffold comprises a mixture of hyaluronic acid and the recombinant collagen fragment.

18. The biomaterial or the use of claim 17, wherein the recombinant collagen fragment is mixed with the hyaluronic acid.

19. The biomaterial or the use of claim 18, wherein the hyaluronic acid scaffold is crosslinked.

20. The biomaterial or the use of claim 18, wherein the hyaluronic acid is a biphasic crosslinked hyaluronic acid comprising crosslinked HA and uncrosslinked HA.

21. The biomaterial or the use of any one of claims 11-14, wherein the pharmaceutically acceptable scaffold comprises a mixture of polyvinylpyrrolidone and the recombinant collagen fragment.

22. The biomaterial or the use of any one of claims 11-14, wherein the pharmaceutically acceptable scaffold comprises a mixture of (i) polyacrylamide, or poly(ethylene oxide), or

poly(2-oxazoline)s, or polyethylenimine, or carboxymethylcellulose, or chondroitin sulfate, or an acetylated hyaluronate, or zinc hyaluronate, and (ii) the recombinant collagen fragment

23. Use of the biomaterial of any one of claims 11, 15-22 in the manufacture of a medicament for treating a wound resulting from resection of a primary tumor.

24. Use of a recombinant collagen fragment having the amino acid sequence set forth in SEQ ID NO: 973 in the manufacture of a therapeutic biomaterial for treating cancer.

25. The use of claim 24, wherein the cancer is characterized by the presence of a solid tumor.

26. The use of claim 25, wherein the cancer is a cancer of the skin, colon, oral mucosa, rectum, esophagus, thyroid, liver, pancreas, kidney, bladder, lung, brain, breast, ovary, testicle, prostate, bones, or a combination of any of the foregoing.

27. The use of any one of claims 24-26, wherein the therapeutic biomaterial is a protein polyurethane alloy.

28. The use of any one of claims 24-26, wherein the therapeutic biomaterial comprises (i) a polyurethane, hyaluronic acid, or gelatin, or (ii) polyvinylpyrrolidone, or (iii) polyacrylamide, or (iv) poly(ethylene oxide), or (v) poly(2-oxazoline)s, or (vi) polyethylenimine, or (vii) carboxymethylcellulose, or (viii) chondroitin sulfate, or (ix) acetylated hyaluronate, or (x) zinc hyaluronate.

29. The recombinant collagen fragment of any one of claims 1-10 or the use of any one of claims24-28, wherein polydispersity of the collagen fragments is 1 to 2, 1 to 3, or 1 to 5.

30. The biomaterial or the use of any one of claims 11-22, wherein polydispersity of the collagen fragments is 1 to 2, 1 to 3, or 1 to 5.