

WHAT IS CLAIMED IS

1. A method for treating a dermal tissue matrix, comprising:
 - selecting a collagen-containing dermal tissue matrix;
 - contacting the dermal tissue matrix with an effective amount of a proteolytic enzyme under conditions that produce an increased level of pliability in the dermal tissue matrix;
 - wherein the enzyme is at least one selected from bromelain, papain, ficin, or actinidin;
 - wherein the collagen-containing dermal tissue matrix ~~includes~~ consists of a dermal tissue matrix that does not contain epidermis; and
 - wherein the dermal tissue matrix is incubated in a decellularizing solution.
2. The method of ~~either of~~ claim 1, wherein the tissue matrix comprises an acellular dermal tissue matrix.
- ~~3. The method of claim 1, wherein the tissue is selected from fascia, pericardial tissue, dura, umbilical cord tissue, placental tissue, cardiac valve tissue, ligament tissue, tendon tissue, arterial tissue, venous tissue, neural connective tissue, urinary bladder tissue, ureter tissue, and intestinal tissue.~~
- ~~43.~~ The method of any one of claims 1–~~32~~, wherein the enzyme is bromelain.
- ~~54.~~ The method of any one of claims 1–~~43~~, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not produce an undesirable change in at least one of tensile strength, tear strength, suture strength, creep resistance, burst strength, or thermal transition temperature.
- ~~65.~~ The method of any one of claims 1–~~43~~, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that increase the porosity of the dermal tissue matrix.
- ~~76.~~ The method of any one of claims 1–~~43~~, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not cause a statistically significant reduction in at least one of tensile strength, tear strength, suture strength, creep resistance, or thermal transition temperature.
- ~~87.~~ A method for treating a dermal tissue matrix, comprising:

selecting a collagen-containing acellular dermal tissue matrix;

contacting the tissue matrix with an effective amount of a proteolytic enzyme under conditions that produce an increased level of pliability in the dermal tissue matrix;

wherein the enzyme is at least one selected from bromelain, papain, ficin, or actinidin;

wherein the collagen-containing tissue matrix ~~includes~~ consists of a dermal tissue matrix that does not contain epidermis; and

wherein the dermal tissue matrix is incubated in a decellularizing solution.

~~9. The method of claim 8, wherein the acellular tissue matrix comprises a dermal tissue matrix.~~

~~10. The method of claim 8, wherein the acellular tissue matrix is selected from fascia, pericardial tissue, dura, umbilical cord tissue, placental tissue, cardiac valve tissue, ligament tissue, tendon tissue, arterial tissue, venous tissue, neural connective tissue, urinary bladder tissue, ureter tissue, and intestinal tissue.~~

~~118.~~ The method of ~~any one of claims 8–10~~ claim 7, wherein the enzyme is bromelain.

~~129.~~ The method of any one of claims ~~87–118~~, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not produce an undesirable change in at least one of tensile strength, tear strength, suture strength, creep resistance, burst strength, thermal transition temperature, or combinations thereof.

~~1310.~~ The method of any one of claims ~~87–118~~, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not cause a statistically significant reduction in tensile strength, tear strength, suture strength, creep resistance, thermal transition temperature, or combinations thereof.

~~1411.~~ An acellular dermal tissue matrix prepared by a processing comprising:

contacting the dermal tissue matrix with an effective amount of a proteolytic enzyme under conditions that produce an increased level of pliability in the dermal tissue matrix;

wherein the enzyme is at least one selected from bromelain, papain, ficin, or actinidin;

wherein the collagen-containing tissue dermal matrix ~~includes~~ consists of a dermal tissue matrix that does not contain epidermis; and

wherein the dermal tissue matrix is incubated in a decellularizing solution.

~~15. The acellular tissue matrix of claim 14, wherein the acellular tissue matrix comprises a dermal tissue matrix.~~

~~16. The acellular tissue matrix of claim 14, wherein the acellular tissue matrix is selected from fascia, pericardial tissue, dura, umbilical cord tissue, placental tissue, cardiac valve tissue, ligament tissue, tendon tissue, arterial tissue, venous tissue, neural connective tissue, urinary bladder tissue, ureter tissue, and intestinal tissue.~~

~~17~~12. The acellular dermal tissue matrix of ~~any one of claims 14-16~~claim 11, wherein the enzyme is bromelain.

~~18~~13. The acellular dermal tissue matrix of any one of claims ~~14-17~~11-12, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not produce an undesirable change in at least one of tensile strength, tear strength, suture strength, creep resistance, burst strength, or thermal transition temperature.

~~19~~14. The acellular dermal tissue matrix of any one of claims ~~14-17~~11-12, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not cause a statistically significant reduction in at least one of tensile strength, tear strength, suture strength, creep resistance, or thermal transition temperature.

~~20~~15. The acellular dermal tissue matrix of any one of claims ~~14-19~~11-14, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that increase the porosity of the dermal tissue matrix.

16. A method for treating a dermal tissue matrix, comprising:

selecting a dermal tissue matrix that does not contain epidermis;

contacting the dermal tissue matrix with a proteolytic enzyme under conditions sufficient to produce a desired level of pliability in the dermal tissue matrix and to increase the porosity of the dermal tissue matrix, wherein the enzyme is at least one selected from bromelain, papain, ficin, or actinidin; and

treating the dermal tissue matrix with a decellularizing solution to remove at least some of the cells and cellular components from the dermal tissue matrix.

17. The method of claim 16, wherein the dermal tissue matrix comprises an acellular dermal tissue matrix.

18. The method of any one of claims 16-17, wherein the enzyme is bromelain.

19. The method of any one of claims 16-18, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not produce an undesirable change in at least one of tensile strength, tear strength, suture strength, creep resistance, burst strength, or thermal transition temperature.

20. The method of any one of claims 16-18, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not cause a statistically significant reduction in at least one of tensile strength, tear strength, suture strength, creep resistance, or thermal transition temperature.

21. The method of any one of claims 16-20, including removal all the cells and cellular components from the dermal tissue matrix.

22. A method for treating a dermal tissue matrix, comprising:
selecting a dermal acellular tissue matrix that does not contain epidermis; and
contacting the dermal tissue matrix with a proteolytic enzyme under conditions sufficient to produce a desired level of pliability in the dermal tissue matrix and to increase the porosity of the dermal tissue matrix, wherein the enzyme is selected from bromelain, papain, ficin, actinidin, or combinations thereof.

23. The method of claim 22, wherein the enzyme is bromelain.

24. The method of any one of claims 22-23, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not produce an undesirable change in at least one of tensile strength, tear strength, suture strength, creep resistance, burst strength, thermal transition temperature, or combinations thereof.

25. The method of any one of claims 22-23, wherein the dermal tissue matrix is contacted with the proteolytic enzyme under conditions that do not cause a statistically significant reduction in tensile strength, tear strength, suture strength, creep resistance, thermal transition temperature, or combinations thereof.