

WHAT IS CLAIMED IS

1. A method for treating a tissue matrix, comprising:

selecting a collagen-containing 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 tissue matrix; ~~and~~

~~removing all the cells and cellular components from the tissue matrix~~

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

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

wherein the tissue matrix is incubated in a decellularizing solution.
2. The method of either of claim 1, wherein the tissue matrix comprises ~~a dermal~~ an acellular 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.
4. The method of any one of claims 1–3, wherein the enzyme is bromelain.
5. ~~The method of any one of claims 1–3, wherein the enzyme is selected from bromelain, papain, ficin, actinidin, or combinations thereof.~~
- 6.5. The method of any one of ~~claims 1–5~~ claims 1–4, wherein the 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.
- 7.6. The method of any one of ~~claims 1–5~~ claims 1–4, wherein the tissue matrix is contacted with the proteolytic enzyme under conditions that increase the porosity of the tissue matrix.

~~8-7.~~ The method of any one of ~~claims 1-5~~claims 1-4, wherein the 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.

~~9-8.~~ A method for treating a tissue matrix, comprising:

selecting a collagen-containing acellular 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 tissue matrix;

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

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

wherein the tissue matrix is incubated in a decellularizing solution.

~~10-9.~~ The method of ~~claim 9~~claim 8, wherein the acellular tissue matrix comprises a dermal tissue matrix.

~~11-10.~~ The method of ~~claim 9~~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.

~~12-11.~~ The method of any one of ~~claim 9-11~~claims 8-10, wherein the enzyme is bromelain.

~~13.~~ ~~The method of any one of claim 9-11, wherein the enzyme is selected from bromelain, papain, ficin, actinidin, or combinations thereof.~~

~~14-12.~~ The method of any one of ~~claim 9-13~~claims 8-11, wherein the 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.

~~15-13.~~ The method of any one of ~~claim 9-13~~claims 8-11, wherein the 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.

~~16-14.~~ An acellular tissue matrix prepared by a processing comprising:

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

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

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

wherein the tissue matrix is incubated in a decellularizing solution.

~~17-15.~~ The acellular tissue matrix of ~~claim 16~~claim 14, wherein the acellular tissue matrix comprises a dermal tissue matrix.

~~18-16.~~ The acellular tissue matrix of ~~claim 16~~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.

~~19-17.~~ The acellular tissue matrix of any one of ~~claims 16-18~~claims 14-16, wherein the enzyme is bromelain.

~~20.~~ The acellular tissue matrix of any one of ~~claims 16-18~~, wherein the enzyme is selected from bromelain, papain, ficin, actinidin, or combinations thereof.

~~21-18.~~ The acellular tissue matrix of any one of ~~claims 16-20~~claims 14-17, wherein the 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.

~~22-19.~~ The acellular tissue matrix of any one of ~~claims 16-20~~claims 14-17, wherein the 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.

~~23-20.~~ The acellular tissue matrix of any one of ~~claims 16-22~~claims 14-19, wherein the tissue matrix is contacted with the proteolytic enzyme under conditions that increase the porosity of the tissue matrix.