Claims

1. A method for preparing a radiation-crosslinked collagen gel, the method comprising irradiating liquid collagen with radiation to prepare a crosslinked collagen.

2. The method of claim 1, wherein the radiation is any one selected from among gamma-rays, electron rays and X-rays.

3. The method of claim 1, wherein the concentration of the collagen in the liquid collagen is 0.1-10% (W/V), and the dose (dose rate x time) of the radiation is 0.1-40 kGy/hr.

4. The method of claim 1, wherein the method comprises mixing 3% (W/V) of collagen with each of 3% (W/V) of synthetic polymer Pluronic F-127, 1% (W/V) of PEO (polyethylene oxide (M.W. = 100,000) and 3% (W/V) of hydroxyapatite and crosslinking the mixture by irradiation with gamma-rays.

5. The method of claim 1, wherein the method comprises mixing 3% (W/V) of collagen with each of 3% (W/V) of biopolymer hyaluronic acid (M.W. = 2,000 K) and 3% (W/V) of chondroitin sulfate and crosslinking the mixture by irradiation with gamma-rays.

6. The method of claim 1, wherein the method comprises mixing 3 % (W/V) of collagen with each of 3% (W/V) of silicone (Dow Corning, 7-9800), 6% (W/V) of glycerin and 6% (W/V) of PBS and crosslinking the mixture by irradiation with gamma-rays, in which the PBS component includes 2.8 mg of sodium phosphate and 7.6 mg

of sodium chloride per mL of the final volume.

7. A radiation-crosslinked collagen gel prepared by the method of claim 1.

8. A method of using a radiation-crosslinked collagen gel, the method comprising: obtaining a partially crosslinked collagen using a low dose of radiation; pouring the partially crosslinked collagen together with a gelling solution into a mold to form a gel; pouring cells and a medium on the gel; culturing the cells on the gel; and using the cultured material (hydrogel) in a mixture with a cosmetic component, or using the hydrogel as a mask pack in a mixture with a cosmetic component, or using the hydrogel as a wound dressing, or applying the hydrogel to an injured skin, or using the hydrogel as a skin graft material.

9. A method of using a radiation-crosslinked collagen gel, the method comprising: obtaining a partially crosslinked collagen using a low dose of radiation; mixing the partially crosslinked collagen with a gelling solution to form a gel; drying the gel to form a thin film; pouring cells and a medium onto the film; culturing the cells on the film; and grafting the cultured corneal cells into an eyeball.

10. A method of using a radiation-crosslinked collagen gel, the method comprising: obtaining a partially crosslinked collagen using a low dose of radiation; mixing the partially crosslinked collagen with a gelling solution and cells; culturing the mixture; finely grinding the cultured material; placing the ground material in a syringe; and grafting the material in the syringe into the skin or bone by

injection.

11. The method of any one of claims 8 to 11, wherein the gelling solution comprises a mixture of sodium hydrogen carbonate ($NaHCO_3$), sodium hydroxide (NaOH) and HEPES.

Claims

1. A method for preparing a radiation-crosslinked collagen gel, the method comprising irradiating liquid collagen with radiation to prepare a crosslinked collagen, and wherein the method comprises mixing 3% (W/V) of collagen with each of 3% (W/V) of synthetic polymer Pluronic F-127, 1% (W/V) of PEO (polyethylene oxide (M.W. = 100,000) and 3% (W/V) of hydroxyapatite and crosslinking the mixture by irradiation with gamma-rays.

2. The method of claim 1, wherein the method comprises mixing 3% (W/V) of collagen with each of 3% (W/V) of biopolymer hyaluronic acid (M.W. = 2,000 K) and 3% (W/V) of chondroitin sulfate and crosslinking the mixture by irradiation with gamma-rays.

3. The method of claim 1, wherein the method comprises mixing 3 % (W/V) of collagen with each of 3% (W/V) of silicone (Dow Corning, 7-9800), 6% (W/V) of glycerin and 6% (W/V) of PBS and crosslinking the mixture by irradiation with gamma-rays, in which the PBS component includes 2.8 mg of sodium phosphate and 7.6 mg of sodium chloride per mL of the final volume.

4. A radiation-crosslinked collagen gel prepared by the method of any one of claims 1 to 3.

5. A method of using a radiation-crosslinked collagen gel, the method comprising: obtaining a partially crosslinked collagen using a low dose of radiation; pouring the partially crosslinked collagen together with a gelling solution into a mold to form a gel; pouring cells and a medium on the gel; culturing the cells on the gel; and using the cultured material

(hydrogel) in a mixture with a cosmetic component, or using the hydrogel as a mask pack in a mixture with a cosmetic component, or using the hydrogel as a wound dressing, or applying the hydrogel to an injured skin, or using the hydrogel as a skin graft material.

6. The method of claim 5, wherein the gelling solution comprises a mixture of sodium hydrogen carbonate ($NaHCO_3$), sodium hydroxide (NaOH) and HEPES.