CLAIMS

1. A biocompatible composition comprising silk fibroin or silk fibroin fragments, hyaluronic acid (HA), and polyethylene glycol (PEG) and/or polypropylene glycol (PPG),

wherein a portion of the HA is modified or crosslinked by one or more linker moieties comprising one or more of polyethylene glycol (PEG), polypropylene glycol (PPG), and a secondary alcohol, and

wherein a portion of the silk fibroin or silk fibroin fragments are free and/or uncrosslinked.

2. The composition of claim 1, wherein a portion of the silk fibroin or silk fibroin fragments are modified or crosslinked.

3. The composition of any one of claims 1 or 2, wherein a portion of the silk fibroin or silk fibroin fragments are crosslinked to HA, and/or

wherein a portion of the silk fibroin or silk fibroin fragments are crosslinked to silk fibroin or silk fibroin fragments.

4. The composition of any one of claims 1 to 3, wherein the silk fibroin or silk fibroin fragments are substantially devoid of sericin.

5. The composition of any one of claims 1 to 4, wherein a portion of silk fibroin or silk fibroin fragments have an average weight average molecular weight selected from between 5 kDa to 38 kDa, from between 14 kDa to 30 kDa, from between 6 kDa to 17 kDa, from between 39 kDa to 54 kDa, from between 31 kDa to 55 kDa, from between 39 kDa to 54 kDa, or from between 55 kDa to 150 kDa.

6. The composition of any one of claims 1 to 5, wherein the silk fibroin or silk fibroin fragments have a polydispersity of between 1 and about 5.0.

7. The composition of any one of claims 1 to 6, wherein modification or cross-linking is obtained using as cross-linker a monoepoxy- or diepoxy-PEG, a monoglycidyl-, diglycidyl-, or polyglycidyl-PEG, a monoglycidyl- or diglycidyl-PEG,

a monoepoxy- or diepoxy-PPG, a monoglycidyl-, diglycidyl-, or polyglycidyl-PPG, a monoglycidyl- or diglycidyl-PPG, or any combinations thereof.

8. The composition of any one of claims 1 to 7, further comprising lidocaine.

9. The composition of any one of claims 1 to 8, wherein the total concentration of HA and silk fibroin or silk fibroin fragments in the composition is about 15 mg/mL, about 16 mg/mL, about 17 mg/mL, about 18 mg/mL, about 19 mg/mL, about 20 mg/mL, about 21 mg/mL, about 22 mg/mL, about 23 mg/mL, about 24 mg/mL, about 25 mg/mL, about 26 mg/mL, about 27 mg/mL, about 28 mg/mL, about 29 mg/mL, about 30 mg/mL, about 31 mg/mL, about 32 mg/mL, about 33 mg/mL, about 34 mg/mL, about 35 mg/mL, about 36 mg/mL, about 37 mg/mL, about 38 mg/mL, about 39 mg/mL, or about 40 mg/mL.

10. The composition of any one of claims 1 to 9, wherein a portion of the free and/or uncrosslinked silk fibroin or silk fibroin fragments comprises silk microparticles having a median particle size ranging from 1.0 μm to 50.0 μm, from 1.0 μm to 25.0 μm, from 1.0 μm to 10.0 μm, from 30.0 μm to 50.0 μm, from 35.0 μm to 45.0 μm, from 35.0 μm to 55.0 μm, or from 25.0 μm to 45.0 μm.

11. The composition of any one of claims 1 to 10, wherein the composition is injectable through 30G or 27G needles, and having an injection force through a 30G needle between about 10 N and about 80 N.

12. The composition of any one of claims 1 to 11, wherein the composition has a storage modulus (*G'*) of from about 5 Pa to about 500 Pa, from about 15 Pa to about 50 Pa, from about 50 Pa to about 100 Pa, from about 100 Pa to about 200 Pa, from about 200 Pa to about 300 Pa, from about 300 Pa to about 350 Pa, from about 350 Pa to about 400 Pa, from about 400 Pa to about 450 Pa, or from about 450 Pa to about 500 Pa.

13. The composition of any one of claims 1 to 11, wherein the composition has a loss modulus (*G"*) of from about 5 Pa to about 500 Pa, from about 15 Pa to

about 50 Pa, from about 50 Pa to about 100 Pa, from about 100 Pa to about 200 Pa, from about 200 Pa to about 300 Pa, from about 300 Pa to about 350 Pa, from about 350 Pa to about 400 Pa, from about 400 Pa to about 450 Pa, or from about 450 Pa to about 500 Pa.

14. The composition of any one of claims 1 to 13, further comprising an imaging agent.

15. A composition according to any one of claims 1 to 14 for use in the treatment or prevention of a disorder, disease, or condition in a subject in need thereof,

wherein the condition is a skin condition selected from skin dehydration, lack of skin elasticity, skin roughness, lack of skin tautness, a skin stretch line, a skin stretch mark, skin paleness, a dermal divot, a sunken cheek, a thin lip, a retro-orbital defect, a facial fold, and a wrinkle, and

wherein the composition is administered into a dermal region of the subject.

16. A composition according to any one of claims 1 to 14 for use in the treatment or prevention of a disorder, disease, or condition in a subject in need thereof,

wherein the use is an augmentation, a reconstruction, treating a disease, treating a disorder, correcting a defect or imperfection of a body part, region or area, a facial augmentation, a facial reconstruction, treating a facial disease, treating a facial disorder, treating a facial defect, or treating a facial imperfection, and

wherein the composition is administered into a deep subcutaneous and/or deep supraperiosteal region of the subject.

17. The composition for use of any one of claims 15 to 16, wherein the use comprises cheek augmentation, lip augmentation, dermal implantation, correction of perioral rhytids, and/or correction of nasolabial fold.

18. A composition according to any one of claims 1 to 14 for use in the treatment or prevention of a disorder, disease, or conditions in a subject in need thereof,

wherein the disorder, disease, or condition is selected from urinary incontinence, gastroesophageal reflux disease (GERD), vesicoureteral reflux, fecal incontinence, dental tissue defects, vocal cord tissue defects, larynx defects, and other non-dermal soft tissue defects.

19. A composition according to any one of claims 1 to 14 for use in the treatment or prevention of a disorder, disease, or conditions in a subject in need thereof,

wherein the use further comprises administration of an anticancer treatment,

wherein the disorder, disease, or condition is selected from cervical cancer, rectal cancer, pulmonary tumors, mediastinum lymphoma, breast cancer, uterine cancer, pancreatic cancer, head and neck cancers, lung cancer, liver cancer, vaginal cancers, benign prostatic hyperplasia (BPH), menorrhagia, uterine fibroids, prostate adenocarcinomas, pancreatic cancer, head and neck cancer, lung cancer, liver cancer, and vaginal cancer.

20. The composition for use of claim 19, wherein the anticancer treatment comprises administering one or more of radiation therapy (RT), cryotherapy, drug treatment, heat and/or thermal ablation, radiofrequency and/or microwave, or cryotherapy.

21. The composition for use of claim 20, wherein the radiation therapy comprises one or more of external beam radiotherapy, 3D conformal modulated radiotherapy, intensity modulated radiotherapy, interstitial prostate brachytherapy, interstitial prostate brachytherapy using permanent seeds, interstitial prostate brachytherapy using temporary seeds, interstitial prostate brachytherapy using high dose rate remote after loading, external radiation therapy using gamma irradiation, high energy photon beam therapy, proton beam therapy, neutron beam therapy, heavy particle beam therapy, brachytherapy, thermal radiation, or any combination thereof.

22. The composition for use of any one of claims 19 to 21, wherein the composition is administered between a first tissue and a second tissue, or into a space or virtual space between a first tissue and a second tissue, and

wherein upon administration of the composition the first tissue is displaced relative to the second tissue.

23. The composition for use of claim 22, wherein the first tissue receives a substantially similar dose of anticancer treatment compared to the anticancer treatment dose the first tissue would receive in the absence of the composition, and

wherein the second tissue receives a lower anticancer treatment dose compared to the anticancer treatment dose the second tissue would receive in the absence of the composition.

24. The composition for use of any of claims 22 to 23, wherein the first tissue and the second tissue each independently comprises a tumor tissue, a group of cells, a group of cells and interstitial matter, an organ, a portion of an organ, or an anatomical portion of a body.

25. The composition for use of any one of claims 22 to 24, wherein the first tissue comprises a tumor tissue, and the second tissue comprises an organ.

26. The composition for use of any one of claims 22 to 24, wherein the first tissue comprises an organ, and the second tissue comprises an organ.

27. The composition for use of claim 26, wherein the first tissue comprises a portion of prostate and the second tissue comprises a portion of rectum.

28. The composition for use of any of claims 15 to 27, further comprising biodegradation of the composition in the subject,

wherein the biodegradation occurs by hyaluronidase enzymatic activity.