The invention claimed is:

1. A dried implant composition consisting essentially of a mixture of nanocrystalline hydroxyapatite particles derived from natural bone having a size of 50 to 200 μm and fragments of naturally crosslinked fibrous collagen material that pass through a 0.5 mm sieve, whereby the w/w ratio of hydroxyapatite to collagen is from 1.8 to 4.5.

2. An injectable aqueous implant formulation for use in oral tissue regeneration, wherein the injectable aqueous implant formulation comprises 25-45 w/w % of a dried implant composition consisting essentially of a mixture of nanocrystalline hydroxyapatite particles derived from natural bone having a size of 50 to 200 μm and fragments of naturally crosslinked fibrous collagen material that pass through a 0.5 mm sieve, whereby the w/w ratio of hydroxyapatite to collagen is from 1.8 to 4.5, homogenized in a pharmaceutically acceptable aqueous vehicle wherein the injectable aqueous implant formulation having properties such that it is extrudable through a tapering system and an 18 gauge (0.838 mm inner diameter) 25.4 mm long cannula with a force not exceeding 60 N.

3. The injectable aqueous implant formulation of claim 2, wherein the formulation comprises 30-40 w/w % of the dried implant and having properties such that it is extrudable through a tapering system and an 18 gauge (0.838 mm inner diameter) 25.4 mm long cannula with a force not exceeding 40 N.

4. The injectable aqueous implant formulation of claim 2, wherein the dried implant composition has a w/w ratio of hydroxyapatite to collagen of from 2.5 to 4.2.

5. A ready to use syringe containing the injectable aqueous implant formulation of claim 2.

6. A kit for preparing the injectable aqueous implant formulation for use in oral tissue regeneration of claim 2 comprising:

a) a syringe equipped with a mixing device and containing: a dried implant composition consisting essentially of a mixture of nanocrystalline hydroxyapatite particles derived from natural bone having a size of 50 to 200 μm and fragments of naturally crosslinked fibrous collagen material that pass through a 0.5 mm sieve, whereby the w/w ratio of hydroxyapatite to collagen is from 1.8 to 4.5; a tapering system; and a gauge 18 (0.838 mm inner diameter) cannula; and

b) a container filled with an appropriate amount of sterile water or a sterile isotonic solution.

7. The kit of claim 6, wherein the container comprising sterile water or a sterile isotonic solution is a syringe with a cannula.

8. A process for preparing the injectable aqueous implant formulation of claim 2 comprising:

providing a dried implant composition consisting essentially of a mixture of nanocrystalline hydroxyapatite particles derived from natural bone having a size of 50 to 200 μm and fragments of naturally crosslinked fibrous collagen material that pass through a 0.5 mm sieve, whereby the w/w ratio of hydroxyapatite to collagen is from 1.8 to 4.5; rehydrating and homogeneously mixing 25-45 w/w % of the dried implant composition in sterile water or a sterile isotonic saline solution.

9. The process of claim 8, comprising rehydrating and homogeneously mixing 25-45 w/w % the dried implant composition in a syringe equipped with a mixing device.

10. The process of claim 8 wherein providing the dried implant composition comprises the following steps:

(a) preparing nanocrystalline hydroxyapatite particles having a size of 50 to 200 μm;

(b) preparing milled naturally crosslinked fibrous collagen material by a process comprising an alkaline treatment, an acid treatment and a treatment by organic solvents, and mincing the naturally crosslinked fibrous collagen material into fragments that pass through a 0.5 mm sieve to obtain the milled naturally crosslinked fibrous collagen material;

(c) adding the milled naturally crosslinked fibrous collagen mixing obtained in (b) to an aqueous solution, vigorously mixing the aqueous solution such as to obtain a collagen slurry, adding the nanocrystalline hydroxyapatite particles having a size of 50 to 200 μm prepared in (a) to the collagen slurry, whereby the w/w ratio of hydroxyapatite to collagen is from 1.8 to 4.5 , and vigorously mixing, at a pH from 4.2 to 7.5 to obtain a mixed composition,

(d) drying the mixed composition containing hydroxyapatite particles and collagen obtained in (c) to obtain a dried implant composition; and

(e) sterilizing by gamma- or X-ray irradiation the dried implant composition obtained in (d).

11. A method of treating a subject with an injectable aqueous implant formulation, wherein the subject is in need of oral tissue regeneration, comprising implanting the injectable aqueous implant formulation of claim 2 in an oral cavity of the subject by extruding the injectable aqueous implant formulation of claim 2 through a tapering system and a gauge 18 cannula (having an inner diameter of 0.838 mm) positioned in the implantation site.

12. The method of claim 11, further comprising, before said implanting:

a) providing a dried implant composition that consists essentially of a mixture of nanocrystalline hydroxyapatite particles derived from natural bone having a size of 50 to 200 μm and fragments of naturally crosslinked fibrous collagen material that pass through a 0.5 mm sieve, whereby the w/w ratio of hydroxyapatite to collagen is from 1.8 to 4.5; and

b) rehydrating 25-45 w/w % of the dried implant composition in a pharmaceutically acceptable aqueous vehicle and mixing to form the injectable rehydrated aqueous implant formulation.

13. The method of claim 12, wherein the dried implant composition has a w/w ratio of hydroxyapatite to collagen of from 2.5 to 4.2.

14. The method of claim 2, wherein in the dried implant composition the hydroxyapatite particles have a size from 100 to 180 μm.

15. The method of claim 12, wherein the dried implant composition has been sterilized by gamma- or X-ray irradiation.

16. The method of claim 12, wherein in the dried implant composition the naturally crosslinked fibrous collagen material is selected from the group consisting of porcine dermis and porcine peritoneum or pericardium membrane.

17. The method of claim 12, wherein the pharmaceutically acceptable aqueous vehicle is sterile water, a sterile isotonic saline solution, blood or fractions thereof.

18. The method of claim 11, wherein the subject is in need of regeneration of alveolar bone, root cementum or periodontal ligament and said implanting promotes regeneration of alveolar bone, root cementum or periodontal ligament in the subject's oral cavity.

19. The method of claim 18, wherein the injectable aqueous implant formulation is implanted into a periodontal pocket.

20. The method of claim 18, wherein the injected aqueous implant formulation provides a matrix of hydroxyapatite and collagen in the subject's oral cavity.