

CLAIMS:

1. A nutritional support material for supplementing tissue survival comprising
 - a) a slow-elution carrier for controlling nutrient release; and
 - b) a nutrient cocktail that comprises glucose;and wherein the slow-elution carrier has a release half-life of between 30 minutes and 14 days.
2. The nutritional support material according to claim 1, wherein the nutritional support material is implantable or injectable.
3. The nutritional support material according to claim 1 or claim 2, wherein the nutrient cocktail comprises DMEM, EMEM, RPMI, IMDM, Ham's F10, or Ham's F12 media powder.
4. The nutritional support material according to any one of claims 1 to 3, wherein the material is in the form of a microparticle between 1 micron and 5 mm in diameter.
5. The nutritional support material according to any one of claims 1 to 4, wherein the carrier is a carrier polymeric matrix, optionally PLGA.
6. The nutritional support material according to any one of claims 1 to 3, wherein the carrier is a coating.
7. The nutritional support material according to claim 6, wherein the coating comprises at least 95% wax or a wax-like substance.
8. The nutritional support material according to any one of claims 1 to 7, wherein the material is in the form of impregnation into a porous implant.

9. The nutritional support material according to any one of claims 1 to 7, wherein the material is in the form of chips, spheres or blocks between 2cm and 20cm in size.
10. The nutritional support material according to any one of claims 1 to 7, wherein the material is in the form of nanoparticles between 5 nanometers and 1 micron.
11. The nutritional support material according to any one of claims 1 to 10, further comprising an antibiotic and/or antifungal to suppress undesirable contamination growth.
12. A method of supplementing tissue survival relating to injury, disease, or surgery, comprising administering the nutritional support material of any one of claims 1 to 11 to the site of tissue injury, disease, surgery, or wound.
13. A method of supplementing autograft bone chips, the method comprising administering the nutritional support material of any one of claims 1 to 11 with a bone graft.
13. A method of supplementing cell therapy, the method comprising administering the nutritional support material of any one of claims 1 to 11 with a cell therapy.
14. A method of increasing healing of tissue injury, disease, surgery, or wound comprising introducing the nutritional support material of any of claims 1 to 11 at the site of tissue injury, disease, surgery, or wound to improve cell survival in the wound environment.
15. The method according to claim 14, wherein said material is introduced during a surgical procedure prior to closure of said site of tissue injury, disease, surgery, or wound.
16. The method according to claim 14, wherein said material is introduced to the site of tissue injury, disease, surgery, or wound prior to a surgical procedure.

17. The method according to claim 14, wherein said material is introduced to the site of tissue injury, disease, surgery, or wound subsequent to a surgical procedure after closure of said site of tissue injury, disease, surgery, or wound.
18. The method according to claim 14, wherein said material is introduced to the site of tissue injury or wound without surgical intervention.
19. The method according to any of claims 14 to 18, wherein the nutritional support material comprises a mixture of one or more of sugars, amino acids, vitamins, fatty acids, minerals, salts, and nucleic acids and a cell culture medium and has a physiologic pH.
20. The method according to any one of claims 14 to 19, wherein said method further comprises introducing waste scavenging materials at the site of tissue injury, disease, surgery, or wound to remove toxins from the site of tissue injury, disease, surgery, or wound.
21. The method according to claim 20, wherein the waste scavenging material comprises activated charcoal.
22. The method according to any one of claim 14 to 21, wherein said nutritional support material is contained within a delivery composition, optionally with said waste scavenging material.
23. The method according to claim 22, wherein said delivery composition is a solid for implant, a liquid for injection, a powder, a chip, a pellet, a microparticle, a nanoparticle, a capsule, a cream, a gel, a lotion, a paste, a coating, an impregnation of an existing implant or tissue, a combination thereof, or any biologically acceptable delivery apparatus.
24. The method according to claim 23, wherein said microparticle is comprised of one or more of PLGA or other encapsulating polymer.
25. The method according to any one of claim 14 to 24, wherein said introducing step comprises one or more of bathing, coating, layering, injecting,

impregnating, or spraying the site of the tissue injury, disease, surgery, or wound with an effective amount of said support material with optional waste scavenging material.

26. The method according to any one of claim 14 to 24, wherein said introducing step comprises inserting at the site of the tissue injury, disease, surgery, or wound prior to surgical closure a delivery composition that is capable of delivering in vivo an effective amount of said support material and optional waste scavenging material.

27. The method according to any one of claim 14 to 24, wherein said introducing step comprises injecting into the site of the tissue injury, disease, surgery, or wound a delivery composition that is capable of delivering in vivo an effective amount of said support material and optional waste scavenging material.

28. The method according to claim 24, wherein said injecting occurs before, during, or after surgical closure of the site of said tissue injury or wound or performed without surgical intervention.

29. The method according to any one of claims 14-25, wherein the surgical procedure is bone grafting, tissue repair, spinal fusion, or insertion of an implant into a bone defect.

30. A composition for increasing healing at the site of a tissue injury, disease, surgery, or wound comprising an effective amount of a nutritional support material and an optional effective amount of a waste scavenging material in a physiologically acceptable delivery system.

31. A composition for implantation into the site of tissue injury, disease, surgery, or wound that is coated with a nutritional support material or a waste scavenging material.

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b) a nutrient cocktail that comprises glucose;
and wherein the slow-elution carrier has a release half-life of between 30
minutes and 14 days.
2. The nutritional support material according to claim 1, wherein the nutritional
support material is implantable or injectable.
3. The nutritional support material according to claim 1 or claim 2, wherein the
nutrient cocktail comprises DMEM, EMEM, RPMI, IMDM, Ham's F10, or Ham's F12
media powder.
4. The nutritional support material according to any one of claims 1 to 3, wherein
the material is in the form of a microparticle between 1 micron and 5 mm in diameter.
5. The nutritional support material according to any one of claims 1 to 4, wherein
the carrier is a carrier polymeric matrix, optionally PLGA.
6. The nutritional support material according to any one of claims 1 to 3, wherein
the carrier is a coating, optionally wherein the coating comprises at least 95% wax or a wax
like substance.
7. The nutritional support material according to any one of claims 1 to 6, wherein
the material is in the form of:
 - (a) impregnation into a porous implant;
 - (b) chips, spheres or blocks between 2cm and 20cm in size; or
 - (c) nanoparticles between 5 nanometers and 1 micron.
8. The nutritional support material according to any one of claims 1 to 7, further
comprising an antibiotic and/or antifungal to suppress undesirable contamination growth.

9. The nutritional support material of any one of claims 1 to 8 for use in supplementing:

(a) tissue survival relating to injury, disease, or surgery, comprising administering the nutritional support material to the site of tissue injury, disease, surgery, or wound;

(b) autograft bone chips, comprising administering the nutritional support material with a bone graft; or

(c) cell therapy, comprising administering the nutritional support material with a cell therapy.

10. The nutritional support material of any one of claims 1 to 8 for use in increasing healing of tissue injury, disease, surgery, or wound comprising introducing the at the site of tissue injury, disease, surgery, or wound to improve cell survival in the wound environment.

11. The nutritional support material for use according to claim 10, wherein said material is introduced:

(a) during a surgical procedure prior to closure of said site of tissue injury, disease, surgery, or wound;

(b) to the site of tissue injury, disease, surgery, or wound prior to a surgical procedure;

(c) to the site of tissue injury, disease, surgery, or wound subsequent to a surgical procedure after closure of said site of tissue injury, disease, surgery, or wound; or

(d) to the site of tissue injury or wound without surgical intervention.

12. The nutritional support material for use according claim 10 or 11, wherein the nutritional support material comprises a mixture of one of more of sugars, amino acids, vitamins, fatty acids, minerals, salts, and nucleic acids and a cell culture medium and has a physiologic pH.

13. The nutritional support material for use according to any one of claims 10 to 12, further comprising introducing waste scavenging materials at the site of tissue injury, disease, surgery, or wound to remove toxins from the site of tissue injury, disease, surgery, or wound, optionally wherein the waste scavenging material comprises activated charcoal.

14. The nutritional support material for use according to any one of claims 10 to 13, wherein said nutritional support material is contained within a delivery composition, optionally with said waste scavenging material, further wherein the delivery composition is a solid for implant, a liquid for injection, a powder, a chip, a pellet, a microparticle optionally comprised of one or more of PLGA or other encapsulating polymer, a nanoparticle, a capsule, a cream, a gel, a lotion, a paste, a coating, an impregnation of an existing implant or tissue, a combination thereof, or any biologically acceptable delivery apparatus.

15. The nutritional support material for use according to any one of claims 10 to 14, wherein said introducing step comprises:

(a) one or more of bathing, coating, layering, injecting, impregnating, or spraying the site of the tissue injury, disease, surgery, or wound with an effective amount of said support material with optional waste scavenging material;

(b) inserting at the site of the tissue injury, disease, surgery, or wound prior to surgical closure a delivery composition that is capable of delivering in vivo an effective amount of said support material and optional waste scavenging material;

(c) injecting into the site of the tissue injury, disease, surgery, or wound a delivery composition that is capable of delivering in vivo an effective amount of said support material and optional waste scavenging material, optionally wherein said injecting occurs before, during, or after surgical closure of the site of said tissue injury or wound or performed without surgical intervention.